

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

1

ID: 10-1 NRO1

Points: 1.00

The plant was at rated power when the following annunciator alarmed:

- EMRV POWER LOST/DISABLED

The Operator reports that there are **NO** lit indicating lights for EMRV NR108A (the bulbs were changed with tested/good bulbs with no change in indication).

Which of the following states whether EMRV NR108A is available to perform its RPV pressure protection function and its ADS function?

	<u>Available for RPV Pressure Protection?</u>	<u>Available for ADS?</u>
A.	Yes	Yes
B.	No	Yes
C.	No	No
D.	Yes	No

Answer: C

Answer Explanation

QID: 10-1 NRO1

Question #	1	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
218000 ADS K1.06 - Knowledge of the physical connections and/or cause- effect relationships between AUTOMATIC DEPRESSURIZATION SYSTEM and the following: Safety/relief valves				3.9	3.9
Level	RO	Tier	2	Group	1
General References	RAP-B5g		BR 2002 Sh. 1 of 4	ADS Lesson Plan	

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Explanation	<p>C is Correct. The indications provided show a complete loss of power to EMRV NR108A. The EMRV solenoid must energize to open the EMRV. Thus, the means the power to open the EMRV, both automatically from any signal and manually from the control switch, has been removed and the valve will stay shut in the current configuration. Position indication for the valve comes from the same power supply as that for the valve, and thus there is no power, normal or alternate, to the valve. Thus, the valve is unavailable to perform either the RPV pressure protection function or ADS function.</p> <p>All distractors are Incorrect but plausible if the applicant does not recall the resultant effect of an EMRV that is disabled on the ADS system.</p>		
References to be provided during exam:	None		
Lesson Plan	2621.828.0005, Automatic Depressurization System		
Learning Objective/	ADS-368, Describe the EMRV initiation logic for both overpressure operation and operation in the ADS mode.		

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified: VISION System/Question ID Question Source		666142 ADS-513		
Cognitive Level	Memory or Fundamental Knowledge	X 1:1	Comprehension or Analysis	
	NUREG 1021 Appendix B: Interlocks, setpoints, or system (singular) response			
10CRF55 Content	55.41(b)	3	55.43(b)	
	Mechanical components and design features of the reactor primary system.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	218000	PRA:	NO	

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Safety Function:	3	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT
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EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

2

ID: 10-1 NRO2

Points: 1.00

The plant is in COLD SHUTDOWN with the Shutdown Cooling (SDC) System in service. Plant conditions include the following:

- SDC Loop A is in service
- SDC Loops B and C are secured
- All RECIRC PUMP SUCTION TEMPS indicate 188°F and rising
- USS 1B2 is de-energized due to maintenance

IAW 305, Shutdown Cooling System Operation, what operator action is required to LOWER RPV temperature?

- A. Place the B or C SDC Loop in service at the discretion of the Unit Supervisor.
- B. Throttle OPEN V-5-107, 'A' SD CLG CCW INLET, to allow more RBCCW flow through the SDC A heat exchanger.
- C. Throttle OPEN V-5-106, SD CLG CCW OUTLET, to allow more RBCCW flow through the SDC A heat exchangers.
- D. Throttle OPEN V-17-55, SHUTDOWN COOLING A DISCHARGE, to allow more SDC flow through the SDC A heat exchanger.

Answer: C

Answer Explanation

QID: 10-1 NRO2

Question # 2 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
205000 Shutdown Cooling K1.05 - Knowledge of the physical connections and/or cause- effect relationships between SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) and the following: Component cooling water systems				3.1	3.1
Level	RO	Tier	2	Group	1
General References	305	BR 3002 Sh. 2 of 4			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>C is Correct. The question stem provides a condition where the SDC System is cooling down the RPV with the A SDC Loop. The stem also states USS 1B2 is de-energized, which powers SDC Pumps B & C, therefore SDC loops B & C are unavailable for cooldown. Procedure 305, SDC System Operation, requires the operator control cooldown rate by throttling RBCCW flow via V-5-106, SD CLG CCW OUTLET. In order to LOWER RPV temperature, V-5-106 must be throttled OPEN.</p> <p>A is Incorrect. This distractor is plausible if the applicant does not recall that SDC Pumps would be unavailable due to a fault on USS 1B2.</p> <p>B is Incorrect. This distractor is plausible if the applicant does not recall that the outlet to the heat exchanger is throttled, not inlet.</p> <p>D is Incorrect. This distractor is plausible if the applicant does not recall that cooldown rate is controlled by throttling the CCW flow, not SDC flow.</p>
References to be provided during exam:	None
Lesson Plan	2621.828.0.0045, Shutdown Cooling System
Learning Objective/	SDC-10453, Explain or describe how this system is interrelated with other plant systems.

Question Source (New, Modified, Bank)		New		
If Bank or Modified: VISION System/Question ID Question Source		N/A		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 2:RI
	NUREG 1021 Appendix B: Recognizing Interaction between systems (plural), including consequences and implications			
10CRF55 Content	55.41	10	55.43	
	Administrative, normal, abnormal, and emergency operating procedures for the facility.			

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Justification for LORT questions with K/A values < 3.0	N/A		
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	205000	PRA:	NO
Safety Function:	4	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

3

ID: 10-1 NRO3

Points: 1.00

The plant was at rated power when the the BOP notices the OPEN and CLOSED indications for V-5-166, CCW OUTLET ISOLATION, are extinguished (assume both lightbulbs are working as designed).

A loss of which **ONE** of the following power supplies would cause the indications observed on V-5-166?

- A. DC B
- B. USS 1A3
- C. MCC 1B21B
- D. 4160V Bus 1A

Answer: C

Answer Explanation

QID: 10-1 NRO3

Question # 3 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
400000 Component Cooling Water K2.02 - Knowledge of electrical power supplies to the following: CCW valves				2.9	2.9
Level	RO	Tier	2	Group	1
General References	BR 3004 Sh. 4 of 6				
Explanation	C is Correct. The question stem is stating that V-5-166 has lost valve indication. The power supply for this CCW (RBCCW) valve indication is MCC 1B21B. A loss of MCC 1B21B will cause a loss of indication to V-5-166. A, B, and D are Incorrect. This distractor is plausible if the applicant does not recall the power supply to V-5-166.				
References to be provided during exam:	None				

EXAMINATION ANSWER KEY

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Lesson Plan	2621.828.0.0035, RBCCW System
Learning Objective/	RBC-CT1, Demonstrate satisfactory knowledge of the RBCCW System.

Question Source (New, Modified, Bank)		New	
If Bank or Modified: VISION System/Question ID Question Source		N/A	
Cognitive Level	Memory or Fundamental Knowledge	X 1:F	Comprehension or Analysis
NUREG 1021 Appendix B: Facts			
10CRF55 Content	55.41	7	55.43
Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	400000	PRA:	NO
Safety Function:	8	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

4

ID: 10-1 NRO4

Points: 1.00

The plant was at rated power. The 125 VDC Distribution System is in a normal lineup.

An event then occurred and the following annunciators came into alarm:

- BUS A/B UV
- DC-E PWR XFER
- 1B1 DC LOST

Which of the following loads **IS** affected by this event?

- A. Remote Shutdown Panel
- B. Containment Spray System 1
- C. Isolation Valve Motor Control Center DC-1
- D. Main Generator Field Excitation Switchgear

Answer: D

Answer Explanation

QID: 10-1 NRO4

Question # 4 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
263000 DC Electrical Distribution K2.01 - Knowledge of electrical power supplies to the following: Major D.C. loads				3.1	3.4
Level	RO	Tier	2	Group	1
General References	BR 3028 Sh. 1 of 2				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>D is Correct. The question stem provides indications (annunciators) for a loss of DC-A. Due to the combined annunciator alarm of BUS A/B UV, the applicant must analyze the other annunciators received and determine there is a loss of DC-A, not DC-B. The MG Field Excitation swithgear is powered from DC-A.</p> <p>A, B, and D are Incorrect. These distractors are plausible if the applicant does not recall major loads powered from DC-A. The RSP is powered from DC-D, DC-1 from DC-B, and Containment Spray System 1 Panel ER8A from DC-F. All still have power and are unaffected.</p>		
References to be provided during exam:	None		
Lesson Plan	2621.828.0.0012, DC Distribution		
Learning Objective/	<p>DCD-1106, Draw a one-line diagram of the 125V DC Dist. system including: Major Buses (A, B, and C Battery Systems), Battery charging power supplies, Major Breakers, Automatic bus transfer switches, Manual bus transfer switches, and Major loads for each DC panel.</p>		

Question Source (New, Modified, Bank)		Modified	
If Bank or Modified:			
VISION System/Question ID		505782	
Question Source		DCD-06	
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis
			X 3:SPK
NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	263000	PRA:	NO

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Safety Function:	6	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT
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EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

5

ID: 10-1 NRO5

Points: 1.00

The plant is at rated power with Core Spray Main Pump NZ01B in Pull-To-Lock for maintenance.

A seismic event then occurred resulting in a simultaneous LOOP and LOCA in the Drywell. Plant conditions include the following:

- Drywell Pressure indicates 3.5 psig and rising
- RPV water level indicates 85 inches and lowering

TWO minutes later, which of the following describes which EDGs are powering which Core Spray System pumps?

EDG-1

EDG-2

- | | | |
|----|--------------------------------|-----------------------------|
| A. | NZ01D ONLY | NZ01C, NZ03C, and NZ03B |
| B. | NZ01D and NZ03D ONLY | NZ01C and NZ03C ONLY |
| C. | NZ01A, NZ01D, and NZ03A | NZ03B ONLY |
| D. | NZ01A, NZ01D, NZ03A, and NZ03D | NONE |

Answer: C

Answer Explanation

QID: 10-1 NRO5

Question # 5 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
209001 LPCS K3.03 - Knowledge of the effect that a loss or malfunction of the LOW PRESSURE CORE SPRAY SYSTEM will have on following: Emergency generators				2.9	3.0
Level	RO	Tier	2	Group	1
General References	341				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>C is Correct. The question stem provides a condition where Main Core Spray Pump NZ01B is unavailable and in PTL. IAW 341, EDG Operation, during a combined LOOP & LOCA event, if NZ01B does not start, then the Alternate Pump (NZ01D) which is powered from EDG-1 will start instead. NZ01A, NZ03A (both powered from EDG-1) will start and NZ01B (powered from EDG-2) will start as expected. The K/A examines the effect on the EDG start logic when a Core Spray component is out of service.</p> <p>A, B, & D are Incorrect. These distractor are plausible if the applicant does not recall Core Spray pump start logic with NZ01B not available.</p>		
References to be provided during exam:	None		
Lesson Plan	2621.828.0.0010, Core Spray System		
Learning Objective/	SDC-10444, Describe the interlock signals and setpoints for the affected system components and expected system response including power loss or failed components.		

Question Source (New, Modified, Bank)		New		
If Bank or Modified:		N/A		
VISION System/Question ID				
Question Source				
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X
				2:RI
NUREG 1021 Appendix B: Recognizing Interaction between systems (plural), including consequences and implications				
10CRF55 Content	55.41	7	55.43	
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

System ID No.:	209001	PRA:	NO
Safety Function:	2 & 4	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

6

ID: 10-1 NRO6

Points: 1.00

The plant was at rated power when an event occurred requiring entry into RPV Control - no ATWS Level Restoration. The event also required the manual isolation of both Isolation Condensers (ICs).

Consider the EOP step below concerning ICs (which can no longer be performed).

**CONFIRM INITIATION
OF THE ISOLATION
CONDENSERS**

What is the EOP basis for the step 'CONFIRM INITIATION OF THE ISOLATION CONDENSERS' and what is the impact now that the ICs are unavailable?

(1) Basis

(2) Impact

- A. (1) To provide a source of makeup water to the RPV.
(2) A significant quantity of cold water is no longer available to help submerge the core.
- B. (1) To lower pressure to allow low pressure systems to inject into the RPV.
(2) Reducing pressure will now take longer using alternate pressure control systems.
- C. (1) To ensure operability of the Isolation Condensers for subsequent steps in the Level Restoration procedure.
(2) Alternate methods of pressure control that are less desirable than the ICs will be required during Level Restoration.
- D. (1) To commence RPV cooldown by reducing RPV pressure as directed by the Pressure Control Leg of RPV Control - no ATWS.
(2) Cooldown IAW the Pressure Control Leg will be required with less desirable alternate methods.

Answer: A

Answer Explanation

QID: 10-1 NRO6

Question #

6

Developer / Date: JJR / 7-11-11

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Knowledge and Ability Reference Information						
K&A					Importance Rating	
					RO	SRO
207000 Isolation (Emergency) Condenser K3.02 - Knowledge of the effect that a loss or malfunction of the ISOLATION (EMERGENCY) CONDENSER will have on following: Reactor water level (EPG's address the isolation condenser as a water source): BWR-2,3					3.8	4.0
Level	RO	Tier	2	Group	1	
General References		EOP User's Guide				
Explanation		A is Correct. IAW the EOP User's Guide, the Isolation Condensers (ICs) contain a significant quantity of relatively cold water within the condenser tube bundles and condensate return piping. Initiating the ICs releases this water, thus providing a source of makeup to the RPV which may help submerge the core for a sufficient length of time to allow other injection systems to be brought on-line. The question asks what impact and why it is a concern that both ICs have been isolated to examine the K/A.				
		B is Incorrect. This distractor is plausible since the Isolation Condensers are used to lower RPV Pressure later in the Level Restoration procedure however the question asked the basis for the specific step of 'Confirm Initiation of the Isolation Condensers'.				
		C and D are Incorrect. These distractors are plausible if the applicant does not recall the basis for 'Confirm Initiation of the Isolation Condensers' and is attempting to make a logical guess.				
References to be provided during exam:		None				
Lesson Plan		2621.845.0.0052, RPV Control - no ATWS				
Learning Objective/		ENA-3055, Given a copy of RPV Control, describe in detail each step or conditional statement, including technical basis, and how to perform each step as required.				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Question Source (New, Modified, Bank)			New	
If Bank or Modified: VISION System/Question ID Question Source		N/A		
Cognitive Level	Memory or Fundamental Knowledge	X 1:B	Comprehension or Analysis	
	NUREG 1021 Appendix B: Bases or purpose			
10CRF55 Content	55.41	10	55.43	
	Administrative, normal, abnormal, and emergency operating procedures for the facility.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	207000	PRA:	NO	
Safety Function:	4	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

7

ID: 10-1 NRO7

Points: 1.00

The plant was at rated power when the following annunciator alarmed:

- DC PWR LOST – BUS C UV

The Operator reports the following indications:

- BATT C AMPS – Downscale
- BATT C VOLTS – Downscale

Which of the following states the impact on the MSIVs and the required action?

	<u>Impact on MSIVs</u>	<u>Required Action</u>
A.	ALL MSIVs close	Execute ABN-1, Reactor Scram, immediately
B.	ONLY the outboard MSIVs close	Execute ABN-1, Reactor Scram, immediately
C.	ALL MSIVs remain open, but ALL auto isolation capability is lost	Manually transfer the DC isolation logic to Bus DC B
D.	ALL MSIVs remain open, but SOME position indication is lost	Reset the MSIV isolation when DC power is restored

Answer: D

Answer Explanation		
QID: 10-1 NRO7		
Question #	7	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information		
K&A	Importance Rating	
	RO	SRO

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

223002 PCIS/Nuclear Steam Supply Shutoff K4.06 - Knowledge of PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT- OFF design feature(s) and/or interlocks which provide for the following: Once initiated, system reset requires deliberate operator action					3.4	3.5
Level	RO	Tier	2	Group	1	
General References	ABN-55		237E566 Sh. 12		301.1	
Explanation	<p>D is Correct. The plant is at rated power when 125 VDC Bus C is lost. DC C supplies 125 VDC Power Panel F, and there is no supply transfer scheme. When DC C is lost, so is DC F. DC F supplies the electrical power to the DC solenoids used in the MSIV automatic isolation logic. There are also AC powered solenoids in the isolation logic. For the MSIVs to auto close, both the DC powered and AC powered solenoids must de-energize. Therefore, with the loss of only 1 set of solenoids, all MSIVs remain open. IAW ABN-55, DC Bus C and Panel Failures, when DC power is restored to DC F, then reset the MSIV isolation.</p> <p>A and B are Incorrect but plausible if the applicant believes the MSIVs will close.</p> <p>C is Incorrect but plausible if the applicant believes the auto isolation logic will no longer function.</p>					
References to be provided during exam:		None				
Lesson Plan	2621.828.0.0030, NSSS					
Learning Objective/	NSS-3956, List the signals which initiate automatic closure of the MSIVs and the setpoints of these signals.					

Question Source (New, Modified, Bank)	Bank
If Bank or Modified: VISION System/Question ID	667523
Question Source	ILT 08-1 RO Audit Exam

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:PEO
	NUREG 1021 Appendix B: <u>P</u>redict an <u>E</u>vent or <u>O</u>utcome			
10CRF55 Content	55.41	7	55.43	
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	223002	PRA:	NO	
Safety Function:	5	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

8

ID: 10-1 NRO8

Points: 1.00

Which one of the following is the reason for the KIRK KEY INTERLOCK associated with Transformer PS-1 disconnect switches SW-733-169 and SW-733-170?

To ensure that...

- A. the RPS MGs cannot be synchronized at any time.
- B. Protection Panel PSP-2 has a redundant source of power.
- C. the RPS MGs are synchronized prior to being transferred to PS-1.
- D. PS-1 cannot be energized from VMCC 1A2 and VMCC 1B2 at the same time.

Answer: D

Answer Explanation

QID: 10-1 NRO8

Question #

8

Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
212000 RPS K4.03 - Knowledge of REACTOR PROTECTION SYSTEM design feature(s) and/or interlocks which provide for the following: The prevention of supplying power to a given RPS bus from multiple sources simultaneously				3.0	3.1
Level	RO	Tier	2	Group	1
General References	913E911	ABN-48			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>D is Correct. The question stem asks for the purpose of the Kirk Key Interlock associated with PS-1 disconnect switches SW-733-169 (which provides PS-1 power from VMCC 1A2) and SW-733-170 (which provides PS-1 power from VMCC 1B2). The interlocks design function is to prevent both disconnect switches from being closed at the same time, thereby allowing only one RPS bus to be powered from its power source at any given time (and also prevents powering a single RPS bus from multiple power sources at the same time). This question is operationally relevant since these actions are taken whenever the crew is recovering from a loss of power to an RPS bus (PSP-1 or PSP-2).</p> <p>A is Incorrect. This distractor is plausible if the applicant does not recall the RPS electrical power supply lineup.</p> <p>B is Incorrect. It is true that PSP-2 has a redundant source of power however the question is asking what the purpose of the Kirk Key Interlock is. This distractor is plausible if the applicant does not answer the question being asked.</p> <p>D is Incorrect. This distractor is plausible if the applicant does not recall the RPS electrical power supply lineup.</p>
References to be provided during exam:	None
Lesson Plan	2621.828.0.0037, Reactor Protection System
Learning Objective/	SDC-10436, Using plant procedures and electrical drawings, determine electrical power supply for system equipment and any associated/applicable logic, including power loss effects.

Question Source (New, Modified, Bank)		Bank		
If Bank or Modified: VISION System/Question ID Question Source		506946 192		
Cognitive Level	Memory or Fundamental Knowledge	X 1:B	Comprehension or Analysis	

EXAMINATION ANSWER KEY

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NUREG 1021 Appendix B: Bases or purpose			
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	212000	PRA:	NO
Safety Function:	7	<input checked="checked" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

9

ID: 10-1 NRO9

Points: 1.00

The plant was at rated power with EDG-1 out of service for maintenance. Subsequently, a combined LOOP and LOCA occurred simultaneously. Plant conditions include the following:

- Drywell pressure is 5 psig and rising
- RPV water level is 70 inches and lowering

Which one of the following occurs when the EDG-2 output breaker closes?

- A. NZ03B will start in 0 seconds
- B. NZ01B will start in 10 seconds
- C. NZ01C will start in 10 seconds
- D. NZ03C will start in 20 seconds

Answer: C

Answer Explanation

QID: 10-1 NRO9

Question # 9 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
264000 EDGs K5.06 - Knowledge of the operational implications of the following concepts as they apply to EMERGENCY GENERATORS (DIESEL/JET) : Load sequencing				3.4	3.5
Level	RO	Tier	2	Group	1
General References	341				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>C is Correct. The question stem provides a condition where there is a LOOP-LOCA with EDG-1 OOS. In order for the LOOP-LOCA EDG logic to initiate, Drywell pressure must be > 2.9 psig and RPV level must be < 90 inches (which is why this must be stated in the stem). IAW 341, EDG Operation, the only statement that is true is that NZ01C will start 10 seconds after the EDG-2 output breaker closes.</p> <p>A, B, and D are Incorrect. These distractors are plausible if the applicant does not recall LOOP-LOCA EDG load sequences with 1 EDG OOS. All pumps would be powered from EDG-2, however the times they start are incorrect.</p>
References to be provided during exam:	None
Lesson Plan	2621.828.0.0013, Emergency Diesel Generators
Learning Objective/	EDG-813, Explain the differences between normal EDG start sequence and fast start sequence, including trip bypasses and automatic fault resets.

Question Source (New, Modified, Bank)		New	
If Bank or Modified:		N/A	
VISION System/Question ID			
Question Source			
Cognitive Level	Memory or Fundamental Knowledge	X 1:1	Comprehension or Analysis
	NUREG 1021 Appendix B: Interlocks, setpoints, or system (singular) response		
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	264000	PRA:	NO
Safety Function:	6	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

10

ID: 10-1 NRO10

Points: 1.00

The Main Generator is in the process of being synchronized to the grid via GD1 IAW 315.1, Turbine Generator Startup.

Panel 8F/9F Main Generator Synchronizing indications are as follows:

- RUNNING voltage indicates 230 KV
- INCOMMING voltage indicates 231 KV
- FREQUENCY indicates 60.0 CYCLES (Hz)
- SYNCHROSCOPE is rotating in the SLOW direction (counterclockwise)

IAW 315.1, which of the following actions are **REQUIRED** before GD1 can be closed?

- A. **RAISE** RUNNING voltage until it equals INCOMMING voltage.
- B. **RAISE** Main Generator speed using the Speed Load Changer.
- C. **LOWER** Main Generator speed using the Speed Load Changer.
- D. **LOWER** INCOMMING voltage until it is less than RUNNING voltage.

Answer: B

Answer Explanation

QID: 10-1 NRO10

Question # 10 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
262001 AC Electrical Distribution K5.01 - Knowledge of the operational implications of the following concepts as they apply to A.C. ELECTRICAL DISTRIBUTION: Principle involved with paralleling two A.C. sources				3.1	3.4
Level	RO	Tier	2	Group	1
General References	315.1				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>B is Correct. The question stem provides a condition where the Main Generator is about to be synchronized to the grid (paralleling two AC power sources). Part of the requirements are to have Generator INCOMMING voltage slightly higher than RUNNING voltage, which it is. Another requirement is to ensure the synchroscope is rotating slowly in the FAST direction (the stem states it's rotating in the SLOW direction. 315.1 directs raising Generator speed using the Speed Load Changer which will cause the synchroscope to change direction.</p> <p>B, C and D are Incorrect. These distractors are plausible if the applicant does not recall the requirements of 315.1 and that of paralleling two AC power sources.</p>	
References to be provided during exam:	None	
Lesson Plan	2621.828.0.0016, Electrical Distribution	
Learning Objective/	SDC-10447, Given normal operating procedures and documents for the system, describe or interpret the procedural steps.	

Question Source (New, Modified, Bank)		New	
If Bank or Modified:		N/A	
VISION System/Question ID			
Question Source			
Cognitive Level	Memory or Fundamental Knowledge	X 1:P	Comprehension or Analysis
	NUREG 1021 Appendix B: Procedure steps and cautions		
10CRF55 Content	55.41	10	55.43
	Administrative, normal, abnormal, and emergency operating procedures for the facility.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	262001	PRA:	NO
Safety Function:	6	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

11

ID: 10-1 NRO11

Points: 1.00

The plant was at rated power when the following annunciators alarmed:

- PROT SYS PNL 2 PWR LOST
- RPS MG SET 2 TRIP
- IP-4 PWR XFER
- CIP-3 PWR XFER
- SCRAM CONTACTOR OPEN

Which of the following states the plant impact?

- A. RWCU Isolation
- B. Full Reactor Isolation
- C. APRMs 1-4 fail downscale
- D. APRMs 5-8 fail downscale

Answer: D

Answer Explanation

QID: 10-1 NRO11

Question # 11 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A					Importance Rating	
					RO	SRO
262002 UPS (AC/DC) K6.01 - Knowledge of the effect that a loss or malfunction of the following will have on the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) : A.C. electrical power					2.7	2.9
Level	RO	Tier	2	Group	1	
General References	ABN-51					

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>NOTE: This question refers to the loss of power to a Vital AC distribution system bus since Oyster Creek does not have a designated UPS. This has been an approved method of examining this K/A on the previous two NRC exams.</p> <p>D is Correct. The question stem states a loss of power to VMCC 1B2 (which feeds RPS MG Set 2, IP-4 and CIP-3), which includes loss of power to RPS MG set 2 to PSP-2. When RPS MG Set 2 output is lost, APRMs 5-8 fail downscale.</p> <p>A is Incorrect. This distractor is plausible if the applicant does not recall that the RWCU system is unaffected by the loss of VMCC 1B2 or does not recognize from the conditions in the stem that VMCC 1B2 was lost.</p> <p>B is Incorrect. This distractor is plausible if the applicant believes the conditions in the stem (SCRAM CONTACTOR OPEN annunciator) indicates a full Scram and Reactor Isolation have occurred.</p> <p>C is Incorrect. This distractor is plausible if the applicant does not interpret the indications provided correctly to determine that PSP-2 lost power (which powers APRMs 5-8) and not PSP-1 (which powers APRMs 1-4).</p>
References to be provided during exam:	None
Lesson Plan	2621.828.0.0056, Vital AC Distribution
Learning Objective/	VAC-10436, Using plant procedures and drawings, determine electrical power supply for system equipment and any associated applicable logic, including power loss effects.

Question Source (New, Modified, Bank)	Modified
If Bank or Modified: VISION System/Question ID Question Source	607666 VAC-500

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPK
	NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			
10CRF55 Content	55.41	7	55.43	
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	262002	PRA:	NO	
Safety Function:	6	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

12

ID: 10-1 NRO12

Points: 1.00

A plant startup has just commenced. An event then occurs which results in the loss of power to the SRM 24 drawer.

Which of the following is correct for these conditions?

- A. SRM indication digital recorder on Panel 4F has lost power.
- B. SRM Channel 24 SRM PERIOD on Panel 4F indicates infinity.
- C. SRM Channel 24 PERIOD meter on Panel 5R indicates downscale.
- D. SRM Channel 24 COUNTS PER SECOND meter on Panel 5R indicates upscale.

Answer: C

Answer Explanation

QID: 10-1 NRO2		
Question #	2	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
215004 Source Range Monitor K6.04 - Knowledge of the effect that a loss or malfunction of the following will have on the SOURCE RANGE MONITOR (SRM) SYSTEM : Detectors				2.9	2.9
Level	RO	Tier	2	Group	1
General References	706E812 Sh. 4				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>C is Correct. 24 VDC powers the SRM drawer, including the trip relays and detector. A loss of instrument power results in the downscale indication of the SRM meters and period meters, both on Panel 5R and 4F. SRM 24 Period meter on Panel 5R will therefore indicate downscale from a loss of instrument power to the SRM 24 detector.</p> <p>A is Incorrect. The SRM digital display indication on Panel 4F receives power from 120 VAC CIP Div 1, therefore the digital display has not lost power.</p> <p>B and D are Incorrect. These distractors are plausible if the applicant does not recall the effect of a loss of instrument power to an SRM channel detector drawer on SRM indications.</p>
References to be provided during exam:	None
Lesson Plan	2621.828.0.0029, Nuclear Instrumentation
Learning Objective/	NIS-10436, Using plant procedures and electrical drawings, determine electrical power supply for system equipment and any associated/applicable logic, including power loss effects.

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified: VISION System/Question ID Question Source		510841 / OC RO NRC 19 ILT 05-1 NRC Exam	
Cognitive Level	Memory or Fundamental Knowledge	X 1:I	Comprehension or Analysis
	NUREG 1021 Appendix B: Interlocks, setpoints, or system (singular) response		
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	215004	PRA:	NO

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Safety Function:	7	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT
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EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

13

ID: 10-1 NRO13

Points: 1.00

The following plant conditions and sequence of events occur:

- The plant is operating at 30% power
- Feedwater Level Control is in automatic
- Master Feed Controller is set at 163"
- Reactor water level is 163"
- Reactor pressure is 1020 psig

At T = 0 seconds, a manual scram is inserted and a hydraulic ATWS occurs

At T = 60 seconds the following plant conditions exist:

- Reactor power is 20%
- Reactor water level has lowered to 155"
- Reactor pressure is 1010 psig

With **NO** operator action, how will the feedwater control system respond to maintain level?

Reactor water level will be automatically controlled at a ...

- A. 142" setpoint using the low flow regulating valves
- B. 163" setpoint using the low flow regulating valves
- C. 142" setpoint using the main feed regulating valves
- D. 163" setpoint using the main feed regulating valves

Answer: D

Answer Explanation

QID: 10-1 NRO13		
Question #	13	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information		
K&A	Importance Rating	
	RO	SRO

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

259002 Reactor Water Level Control A1.05 - Ability to predict and/or monitor changes in parameters associated with operating the REACTOR WATER LEVEL CONTROL SYSTEM controls including: FWRV/startup level control position: Plant-Specific				2.9	2.9
Level	RO	Tier	2	Group	1
General References	MDD-OC-625-B Div I				
Explanation	<p>D is Correct. A normal scram is processed through RPS to Feedwater Control and validated by a 10 “ drop in level. Though this scram was processed by RPS a 10” drop in level did not validate it due to the hydraulic lock. The post scram level control setpoint of 142” TAF will not be substituted. There is no automatic transfer to the low flow valves for level control nor will feed flow requirements at this power level allow a manual swap to the low flow valves as would be the case in a successful scram. Because the scram was not validated by a 10” drop in level, the FW control system will continue to attempt to maintain level at the existing setpoint of 163”TAF without post scram level control.</p> <p>A and C are Incorrect. These distractors are plausible if the applicant believes the post scram level control setpoint will have been processed.</p> <p>B is Incorrect. This distractor is plausible if the applicant believes the Low Flow Valves will be regulating flow for these conditions.</p>				
References to be provided during exam:	None				
Lesson Plan	2621.828.0.0018, Feedwater Control System				
Learning Objective/	FWC-10446, Identify and explain system operating controls / indications under all plant operating conditions.				

Question Source (New, Modified, Bank)	Bank
If Bank or Modified: VISION System/Question ID Question Source	608199 ILT 07-1 RO Comp #2

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 2:DR
	NUREG 1021 Appendix B: Describing or Recognizing relationships			
10CRF55 Content	55.41	5	55.43	
	Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	259002	PRA:	NO	
Safety Function:	2	<input checked="checked" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

14

ID: 10-1 NRO14

Points: 1.00

The plant is at rated power with the following plant conditions:

- Standby Gas Treatment System (SGTS) I is selected as the PREFERRED system.
- Drywell pressure rises to 3.6 psig due to a steam leak.

ONE MINUTE later, Drywell pressure indicates 2.6 psig.

If the RO depresses the DRYWELL ISOLATION RESET pushbutton on Panel 4F, how will the SGTS **AND** Reactor Building differential pressure (ΔP) indication on Panel 11R respond?

	<u>SGTS Response</u>	<u>Reactor Building ΔP Response</u>
A.	Shutdown occurs	Goes to zero
B.	Continues to run	Remains the same
C.	Shutdown occurs	Remains the same
D.	Continues to run	Becomes more negative

Answer: A

Answer Explanation		
QID: 10-1 NRO14		
Question #	14	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
261000 SGTS A1.04 - Ability to predict and/or monitor changes in parameters associated with operating the STANDBY GAS TREATMENT SYSTEM controls including: Secondary containment differential pressure				3.0	3.3
Level	RO	Tier	2	Group	1

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

General References	330		
Explanation	<p>A is Correct. A high drywell pressure is an initiating signal for the SGTS. After the condition clears and the drywell isolation reset is depressed, an automatic shutdown of the SGTS occurs. Since the running exhaust fan trips a negative pressure is no longer maintained, pressure is equalized and goes to zero.</p> <p>B is Incorrect. This distractor is plausible if the applicant does not recall that SGTS Shutdown, not continue to run for these conditions.</p> <p>C is Incorrect. This distractor is plausible if the applicant does not recall that RB ΔP becomes less negative and goes to zero. The applicant may believe there is no reason for RB ΔP to drift to zero.</p> <p>D is Incorrect. This distractor is plausible if the applicant does not recall that SGTS Shutdown, not continue to run for these conditions. It is plausible with continued SGTS operation, RB ΔP might be more negative.</p>		
References to be provided during exam:	None		
Lesson Plan	2621.828.0.0042, Secondary Containment & SGTS		
Learning Objective/	SGT-10439, Given the system logic/electrical drawings, describe the system auto initiation signals, setpoints and expected system response including power loss or failed components.		

Question Source (New, Modified, Bank)		Modified	
If Bank or Modified:			
VISION System/Question ID		506540 / IRH-21-28-0042	
Question Source		ILT 07-1 Comp 1	
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis
	X 3:PEO NUREG 1021 Appendix B: Predict an Event or Outcome		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

10CRF55 Content	55.41	7	55.43	
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			
Justification for LORT questions with K/A values < 3.0	N/A			
Time to Complete: 1-2 minutes		Point Value: 1		
System ID No.:	261000	PRA:	NO	
Safety Function:	9	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

15

ID: 10-1 NRO15

Points: 1.00

The operating crew is raising power with control rods after an outage. The plant is in 5 recirc loop operation.

Plant indications include the following:

- Reactor power is 85%
- TOTAL RECIRC FLOW (Panel 4F) indicates 150×10^3 GPM

The following annunciator alarmed:

- APRM FLO BIAS OFF NORMAL

Investigation revealed that the flow transmitter in the "C" Recirc. Loop that feeds the TOTAL RECIRC FLOW indicator on 4F, failed to 0 (zero).

Which of the following states the impact of the above alarm/indications **AND** what action is required?

	<u>IMPACT</u>	<u>ACTION</u>
A.	ONLY a rodblock exists	Place the affected APRMs in BYPASS and continue raising power
B.	ONLY a rodblock exists	Hold power until the "C" flow transmitter can be returned to service
C.	A rodblock AND a 1/2 scram exists	Hold power until the "C" flow transmitter can be returned to service
D.	A rodblock AND a 1/2 scram exists	Place the affected APRMs in BYPASS and continue raising power

Answer: B

Answer Explanation

QID: 10-1 NRO15

Question #	15	Developer / Date: JJR / 7-11-11
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EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Knowledge and Ability Reference Information						
K&A					Importance Rating	
					RO	SRO
215005 APRM / LPRM A2.05 - Ability to (a) predict the impacts of the following on the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions: Loss of recirculation flow signal					3.5	3.6
Level	RO	Tier	2	Group	1	
General References	202.1		RAP-H7a		RAP-G5f	
Explanation	B is Correct. Prior to the failure, each (Division 2) flow transmitter is sensing approximately 30.0 E ³ gpm, which is summed to produce 150.0 E ³ total recirc flow. One transmitter failing to zero results in a total indicated recirc flow of 120.0 E ³ gpm. This produces in a 20% mismatch between the Division 1 and 2 recirc flow monitors, causing a flow comparator rod block (setpoint 10%). Also, from the Power Operations Curve, there is no ½ scram from this power and flow. There is no bypass for this type of rodblock, and the only way to resume the power rise is to return the failed sensor to service.					
	A is Incorrect. This distractor is plausible if the applicant does not recall that bypassing APRMs for this condition will not clear the Rod Block.					
	C is Incorrect. This distractor is plausible if the applicant does not recall that there is no 1/2 scram from the conditions provided.					
	C is Incorrect. This distractor is plausible if the applicant does not recall that there is no 1/2 scram from the conditions provided. In addition, bypassing APRMs for this condition will not clear the Rod Block.					
References to be provided during exam:		Attachment 202.1-2				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Lesson Plan	2621.828.0.0029, Nuclear Instrumentation
Learning Objective/	NIS-10445, Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.

Question Source (New, Modified, Bank)		Modified	
If Bank or Modified:			
VISION System/Question ID		608584 / IRH-21-28-0029	
Question Source		ILT 07-1 Comp 3	
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis
			X 3:PEO
NUREG 1021 Appendix B: Predict an Event or Outcome			
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	215005	PRA:	NO
Safety Function:	7	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

16

ID: 10-1 NRO16

Points: 1.00

The plant is at 20% power during an ascension to rated power. An event then occurs resulting in the crew executing Emergency Depressurization (ED). Plant conditions include the following:

- All Control Rod indications on Panel 4F indicate a green backlight
- All EMRV Control switches on Panel 1F/2F are in MAN
- Reactor Pressure indicates 5 psig
- RPV Water Level indicates 165 inches
- Torus Pressure indicates 1.5 psig

What is the correct status of all EMRV acoustic indications on Panel 1F/2F **AND** required action (IAW the ED procedure) associated with the EMRVs, if any?

<u>All EMRVs Acoustics</u> <u>Indicate In The...</u>		<u>Required Action</u>
A.	VALVE OPEN REGION	Place All EMRVs in AUTO
B.	VALVE CLOSED REGION	Leave All EMRVs in MAN
C.	VALVE OPEN REGION	Leave All EMRVs in MAN
D.	VALVE CLOSED REGION	Place All EMRVs in AUTO

Answer: B

Answer Explanation

QID: 10-1 NRO16		
Question #	16	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information		
K&A	Importance Rating	
	RO	SRO
239002 SRVs A2.05 - Ability to (a) predict the impacts of the following on the RELIEF/SAFETY VALVES ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Low reactor pressure	3.2	3.4

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Level	RO	Tier	2	Group	1
General References	EOP User's Guide	ED-no ATWS EOP			
Explanation	<p>B is Correct. The question stem provides a condition where all EMRVs have been manually opened for ED. When RPV pressure lowers to where there is < 50 psid between the RPV and Torus, the EMRVs will close. The ED procedure has the operator leave the EMRVs in MAN until the ED procedure has been exited.</p> <p>A is Incorrect. This distractor is plausible if the applicant does not recall that EMRVs solenoid indication will indicate closed when there is < 50 psid between RPV pressure and Torus pressure. In addition, the ED procedure has the crew leave all EMRVs in MAN.</p> <p>C is Incorrect. This distractor is plausible if the applicant does not recall that EMRVs solenoid indication will indicate closed when there is < 50 psid between RPV pressure and Torus pressure.</p> <p>D is Incorrect. This distractor is plausible if the applicant does not recall that the ED procedure has the crew leave all EMRVs in MAN.</p>				
References to be provided during exam:	None				
Lesson Plan	2621.845.0.0054, Emergency Depressurization				
Learning Objective/	EED-9572, Given a copy of the ED EOP, describe the technical basis for each step or conditional statement of the procedure.				

Question Source (New, Modified, Bank)			New	
If Bank or Modified: VISION System/Question ID Question Source		N/A		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:PEO
	NUREG 1021 Appendix B: <u>P</u> redict an <u>E</u> vent or <u>O</u> utcome			
10CRF55 Content	55.41	10	55.43	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Administrative, normal, abnormal, and emergency operating procedures for the facility.			
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	239002	PRA:	NO
Safety Function:	3	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

17

ID: 10-1 NRO17

Points: 1.00

A plant startup is in progress with the REACTOR MODE SELECTOR switch in STARTUP. An event then occurs and IRM 15 fails INOP.

Which of the following conditions will occur as a result of this event?

- A. A 1/2 scram **ONLY**
- B. A Rod Block **ONLY**
- C. A Rod Block **AND** a 1/2 scram
- D. **NEITHER** a Rod Block **OR** 1/2 scram

Answer: C

Answer Explanation

QID: 10-1 NRO17

Question #

17

Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
215003 IRM A3.03 - Ability to monitor automatic operations of the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM including: RPS status				3.7	3.6
Level	RO	Tier	2	Group	1
General References	RAP-G2e		RAP-H7a		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	C is Correct. An IRM that's failed INOP with the REACTOR MODE SELECTOR switch in STARTUP or REFUEL will result in both a rod block and 1/2 scram.		
	A is Incorrect. This distractor is plausible if the applicant does not recall that a rod block also results from this event.		
	B is Incorrect. This distractor is plausible if the applicant does not recall that a 1/2 scram also results from this event.		
	D is Incorrect. This distractor is plausible if the applicant does not recall that both a rod block and 1/2 scram results from this event.		
	NOTES: 1) This question left as Low Cognitive due to exam having the maximum limit of 45 High Cognitive questions on the RO exam already. 2) The question stem must state that the Mode Switch is in Startup since the Mode Switch in Run would change the answer. The Mode Switch is placed in Run during a startup when all APRM downscale alarms are clear.		
References to be provided during exam:		None	
Lesson Plan	2621.828.0.0029, Nuclear Instrumentation		
Learning Objective/	NIS-10441, Given the system logic/electrical drawings, describe the system trip signals, setpoints and expected system response including power loss or failed components.		

Question Source (New, Modified, Bank)		Modified	
If Bank or Modified: VISION System/Question ID Question Source		608227 / IRL-21-28-0029 ILT 07-1 Comp 2	
Cognitive Level	Memory or Fundamental Knowledge	X 1:1	Comprehension or Analysis
	NUREG 1021 Appendix B: Interlocks, setpoints, or system (singular) response		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

10CRF55 Content	55.41	7	55.43	
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	215003	PRA:	NO	
Safety Function:	7	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

18

ID: 10-1 NRO18

Points: 1.00

The plant was at rated power when an event occurred resulting in an ATWS.

The RO has just placed the Standby Liquid Control (SLC) System 1 keylock to FIRE SYS 1.

ONE MINUTE later, which of the following shows the correct Reactor Water Cleanup (RWCU) valve indications?

NOTE:

V-16-1: RWCU CLEANUP SYSTEM isolation (Panel 11F)

V-16-2: RWCU AUX PUMP SUCTION (Panel 3F)

V-16-14: RWCU SYSTEM INLET (Panel 3F)

V-16-61: RWCU SYSTEM OUTLET (Panel 3F)

	<u>V-16-1</u>	<u>V-16-2</u>	<u>V-16-14</u>	<u>V-16-61</u>
A.	CLOSED	CLOSED	CLOSED	OPEN
B.	CLOSED	CLOSED	OPEN	OPEN
C.	OPEN	OPEN	CLOSED	CLOSED
D.	CLOSED	CLOSED	CLOSED	CLOSED

Answer: A

Answer Explanation

QID: 10-1 NRO18		
Question #	18	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
211000 SLC A4.06 - Ability to manually operate and/or monitor in the control room: RWCU system isolation: Plant-Specific				3.9	3.9
Level	RO	Tier	2	Group	1
General References	RAP-G1b				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>A is Correct. IAW RAP-G1b, when SLC is initiated, RWCU valves V-16-1, V-16-2, and V-16-14 all isolate. RWCU valve V-16-61 remains open.</p> <p>B, C, and D are Incorrect. These distractors are plausible if the applicant does not recall which RWCU valves isolate when SLC is initiated.</p>	
References to be provided during exam:	None	
Lesson Plan	2621.828.0.0046, Standby Liquid Control	
Learning Objective/	SLC-10453, Explain or describe how this system is interrelated with other plant systems.	

Question Source (New, Modified, Bank)		Modified	
If Bank or Modified:			
VISION System/Question ID		506610	
Question Source		SLC-4	
Cognitive Level	Memory or Fundamental Knowledge	X 1:1	Comprehension or Analysis
	NUREG 1021 Appendix B: Interlocks, setpoints, or system (singular) response		
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	211000	PRA:	NO
Safety Function:	1	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

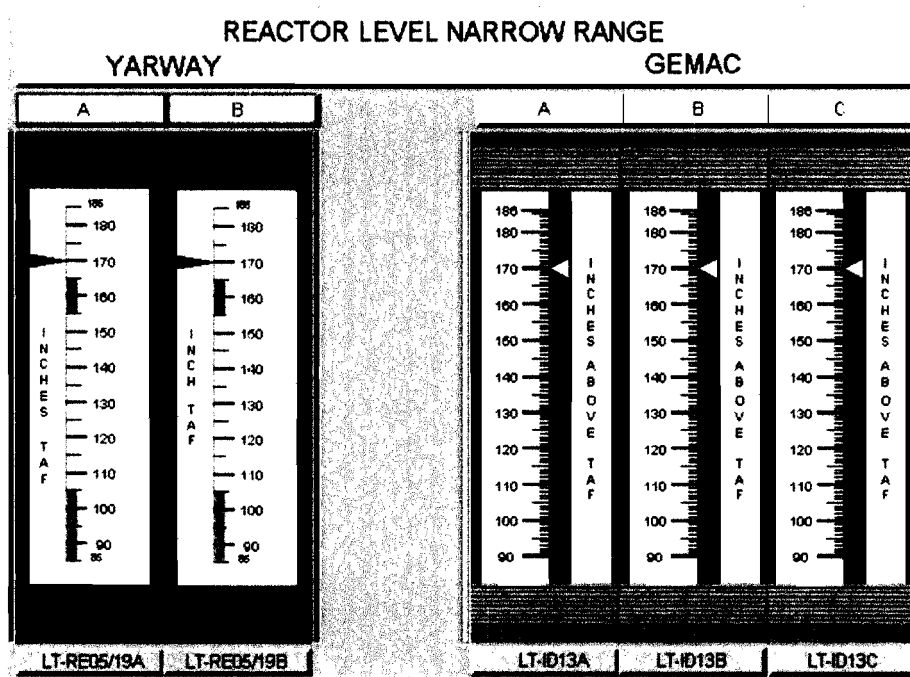
19

ID: 10-1 NRO19

Points: 1.00

The plant is at rated power. Which of the following indication(s) below **PROCEDURALLY REQUIRE** entry into ABN-1, Reactor Scram?

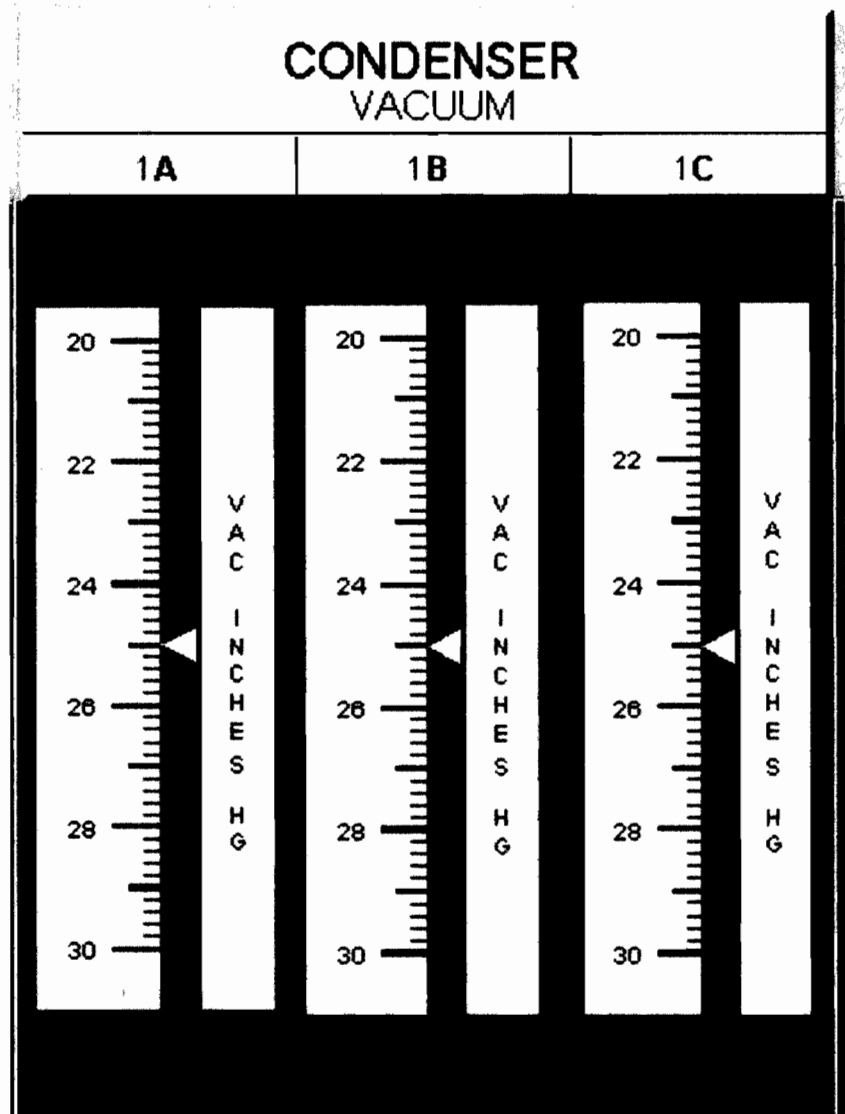
A.



EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

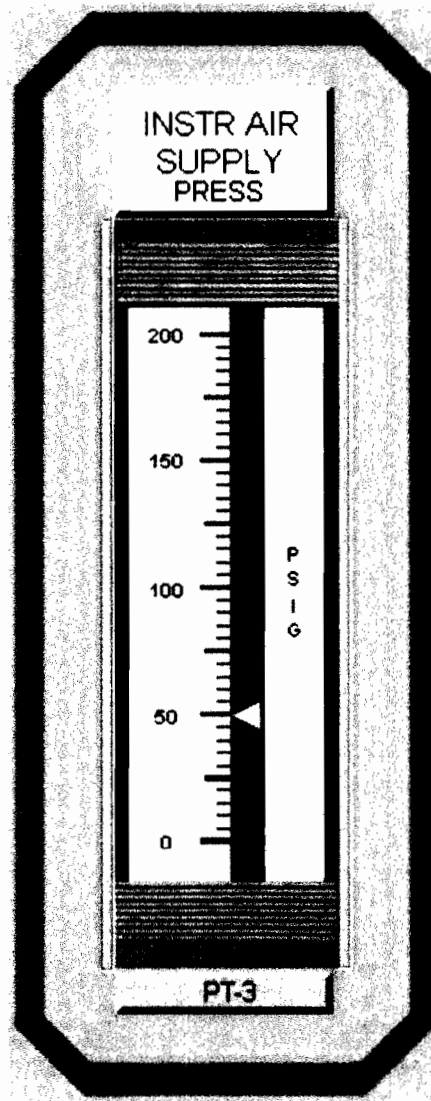
B.



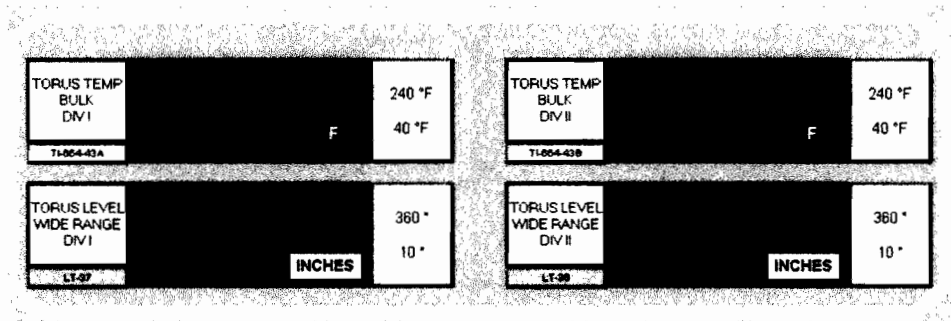
EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

C.



D.



Answer: C

Answer Explanation

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

QID: 10-1 NRO19		
Question #	19	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information						
K&A				Importance Rating		
				RO	SRO	
300000 Instrument Air A4.01 - Ability to manually operate and/or monitor in the control room: Pressure gauges				2.6	2.7	
Level	RO	Tier	2	Group	1	
General References	ABN-35					
Explanation	C is Correct. IAW ABN-35, Loss of Instrument Air, when Instrument Air Supply pressure on PT-3 (Panel 7F) indicates < 55 psig, enter ABN-1 and manually scram the reactor.					
	A is Incorrect. This distractor is plausible if the applicant believes the Main Turbine will trip at 170 inches. ABN-1 will have to be entered after the turbine trip. Actual turbine trip setpoint is 175 inches TAF.					
	B is Incorrect. This distractor is plausible if the applicant believes the reactor will trip on a low vacuum pressure of 25 in Hg. ABN-1 will require to be entered then. Actual low vacuum turbine/reactor trip setpoint is 22 in Hg.					
	D is Incorrect. This distractor is plausible if the applicant believes that a manual scram and entry into ABN-1 is required at 90F Torus temperature. A plant shutdown is required at 95F.					
References to be provided during exam:		None				
Lesson Plan	2621.828.0.0043, Service, Instrument, and Breathing Air.					
Learning Objective/	CAS-10445, Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.					

Question Source (New, Modified, Bank)	New
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EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

If Bank or Modified: VISION System/Question ID Question Source		N/A		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPK
	NUREG 1021 Appendix B: <u>S</u> olve a <u>P</u> roblem using <u>K</u> nowledge and its meaning			
10CRF55 Content	55.41	10	55.43	
	Administrative, normal, abnormal, and emergency operating procedures for the facility.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	300000	PRA:	NO	
Safety Function:	8	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

20

ID: 10-1 NRO20

Points: 1.00

The plant is at power when the following alarms and indications were noted:

- Annunciator DC PWR LOST – BUS C UV
- **BOTH** CHARGER C1 AND CHARGER C2 indicate 0 AMPS
- BATT C indicates 0 AMPS

Which of the following components can still be operated from the Control Room?

- A. CRD Pump A
- B. Feedwater Pump B
- C. Core Spray Main Pump NZ01D
- D. Containment Spray Pump 51B

Answer: B

Answer Explanation

QID: 10-1 NRO20

Question # 20 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
263000 DC Electrical Distribution A4.01 - Ability to manually operate and/or monitor in the control room: Major breakers and control power fuses				3.3	3.5
Level	RO	Tier	2	Group	1
General References	3033	3001B 3001C		3002	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>B is Correct. The question stem shows a low voltage condition on 125 VDC Bus C. It also shows that both chargers to Bus C show no current and that the C Battery also shows no current. These conditions depict a fault on 125 VDC Bus C and that both the chargers and the battery are disconnected from Bus C. DC Bus C provides the DC control power for remote breaker operation for 4160 VAC Bus 1A, 4160 VAC Bus 1C, 460 VAC Busses 1A1, 1A2, and 1A3. With breaker control power gone, there is no longer remote control of the breakers on the AC busses from the control room. Feedwater Pump B is powered from Bus 1B, and thus has DC power.</p> <p>A is Incorrect. This distractor is plausible if the applicant does not recall that CRD Pump A is powered from USS Bus 1A2, and thus has no DC power.</p> <p>C is Incorrect. This distractor is plausible if the applicant does not recall that Core spray main pump NZ01D is powered from Bus 1C, and thus has no DC power.</p> <p>D is Incorrect. This distractor is plausible if the applicant does not recall that Containment Spray Pump 51B is powered from USS 1A2, and thus has no DC power.</p>
References to be provided during exam:	None
Lesson Plan	2621.828.0.0017, Feed and Condensate System
Learning Objective/	CFW-10453, Explain or describe how this system is interrelated with other plant systems.

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified: VISION System/Question ID Question Source		663320 / CFW-IRH-001 ILT 08-1 NRC Exam		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPK
	NUREG 1021 Appendix B: <u>S</u> olve a <u>P</u> roblem using Knowledge and its meaning			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

10CRF55 Content	55.41	7	55.43	
	Administrative, normal, abnormal, and emergency operating procedures for the facility.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	263000	PRA:	NO	
Safety Function:	6	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

21

ID: 10-1 NRO21

Points: 1.00

The plant is at rated power when a **MAJOR FIRE** in the Control Room erupted. All personnel were evacuated. **NO** actions required by ABN-30, Control Room Evacuation, have been completed.

IAW ABN-30, which of the following local 'Backup Method' actions must be completed to scram the reactor and close the MSIVs? In addition, what location are these actions taking place?

	<u>Actions Required</u>	<u>Location</u>
A.	-Trip the RPS MG supply breakers -Trip the supply breakers to PS-1	Old Cable Spreading Room
B.	-Trip the RPS MG output circuit breakers -Turn off SW-733-169 -Turn off SW-733-170	480V Room
C.	-Trip the RPS MG output circuit breakers -Turn off SW-733-169 -Turn off SW-733-170	Old Cable Spreading Room
D.	-Trip the RPS MG supply breakers -Trip the supply breakers to PS-1	480V Room

Answer: D

Answer Explanation

QID: 10-1 NRO21

Question #	21	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
223002 PCIS/Nuclear Steam Supply Shutoff 2.1.30 - Conduct of Operations: Ability to locate and operate components, including local controls.				4.4	4.0
Level	RO	Tier	2	Group	1

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

General References	ABN-30 Att. ABN-30-1		
Explanation	<p>D is Correct. IAW ABN-30, Control Room Evacuation, the Backup Method to scram the reactor and close the MSIVs when a fire in the Control Room exists is Method 1. Locally scram the reactor and close the MSIVs by 1) Tripping the RPS MG supply breakers, and 2) Tripping the supply breaker to the PS-1 MTS from the 480V Room.</p> <p>A is Incorrect. This distractor is plausible if the applicant does not recall the location of these components.</p> <p>B & C are Incorrect. These distractors are plausible since these are alternate actions to scram and close MSIVs, however they are only performed if there is NOT a fire in the Control Room. Since there is, these actions are not an option IAW ABN-30.</p>		
References to be provided during exam:	None		
Lesson Plan	2621.828.0.0030, Nuclear Steam Supply System		
Learning Objective/	NSS-3957, List the automatic actions which occur when the MSIVs close (automatic and manual closure).		

Question Source (New, Modified, Bank)				New	
If Bank or Modified: VISION System/Question ID Question Source			N/A		
Cognitive Level	Memory or Fundamental Knowledge	X 1:F	Comprehension or Analysis		
	NUREG 1021 Appendix B: Facts				
10CRF55 Content	55.41	10	55.43		
	Administrative, normal, abnormal, and emergency operating procedures for the facility.				
Justification for LORT questions with K/A values < 3.0		N/A			
Time to Complete: 1-2 minutes			Point Value: 1		
System ID No.:	223002	PRA:		NO	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Safety Function:	5	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT
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EXAMINATION ANSWER KEY

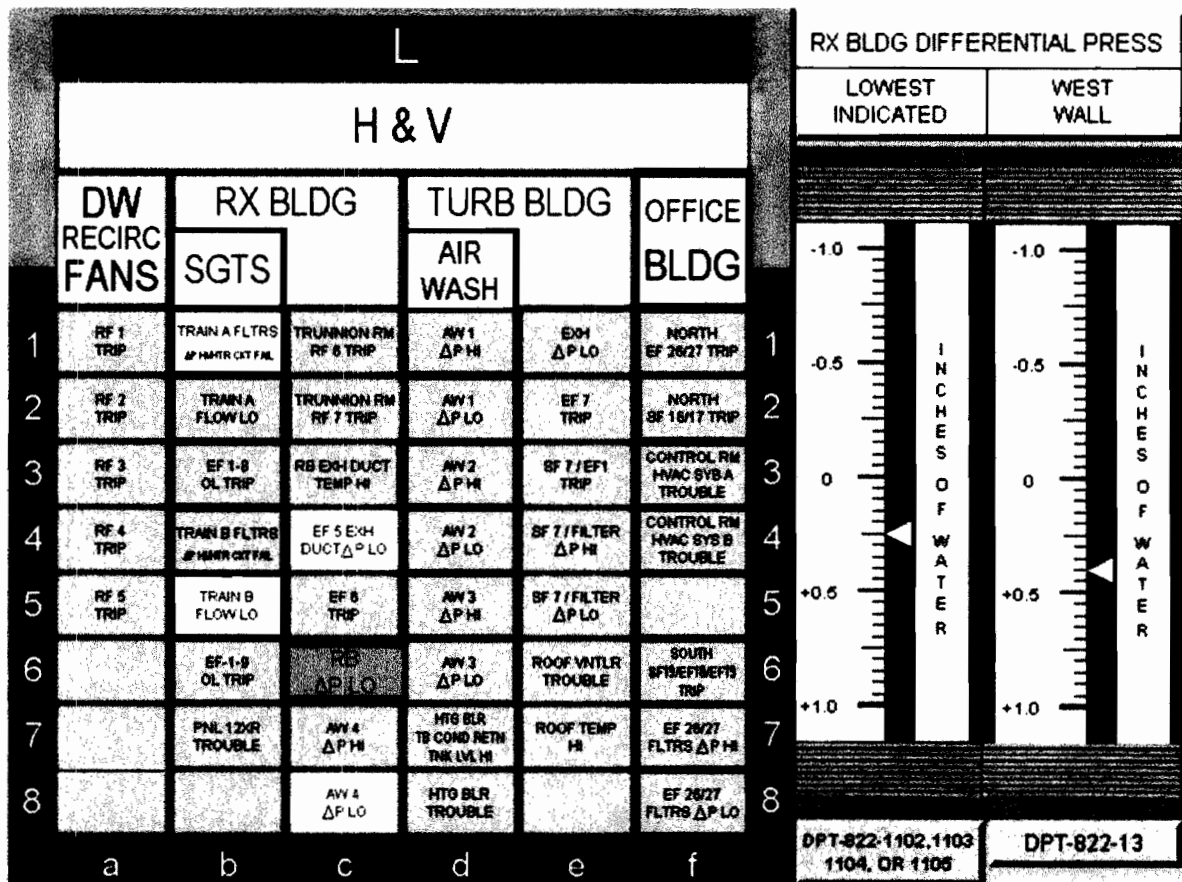
ILT 10-1 NRC RO Exam

22

ID: 10-1 NRO22

Points: 1.00

The plant was at rated power. An event then occurred and plant conditions now include the following:



EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Based **SOLELY** on the indications provided, which Standby Gas Treatment System (SGTS) is running **AND** state whether a Secondary Containment Control (SCC) EOP entry condition has been exceeded?

	<u>SGTS System Running</u>	<u>SCC EOP Entry Exceeded</u>
A.	SGTS 1	No
B.	SGTS 1	Yes
C.	SGTS 2	Yes
D.	SGTS 2	No

Answer: B

Answer Explanation

QID: 10-1 NRO22

Question #	22	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
261000 SGTS 2.4.31 - Emergency Procedures / Plan: Knowledge of annunciator alarms, indications, or response procedures.				4.2	4.1
Level	RO	Tier	2	Group	1
General References	EOP User's Guide		RAP-L1b RAP-L5b		SCC EOP

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>B is Correct. The question stem provides the operator indications that SGTS 1 is running, SGTS 2 has shutdown, and RB dP is > 0 in which requires entry into the SCC EOP.</p> <p>A is Incorrect. This distractor is plausible if the applicant does not recognize that a SCC EOP entry condition has been exceeded on RB dP being > 0 in.</p> <p>C is Incorrect. This distractor is plausible if the applicant does not recognize from the annunciators in alarm that SGTS 1 is running and SGTS 2 has shutdown.</p> <p>D is Incorrect. This distractor is plausible if the applicant does not recognize from the annunciators in alarm that SGTS 1 is running and SGTS 2 has shutdown. In addition, this distractor is plausible if the applicant does not recognize that a SCC EOP entry condition has been exceeded on RB dP being > 0 in.</p>
References to be provided during exam:	None
Lesson Plan	2621.845.0.0057, Secondary Containment Control
Learning Objective/	SCC-1667, Based upon specific plant parameters and conditions, determine if entry conditions for EOPs have been met and which EOPs are applicable to the conditions provided.

Question Source (New, Modified, Bank)		New	
If Bank or Modified: VISION System/Question ID Question Source		N/A	
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis
	NUREG 1021 Appendix B: Describing or recognizing Relationships		
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Justification for LORT questions with K/A values < 3.0	N/A		
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	261000	PRA:	NO
Safety Function:	9	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

23

ID: 10-1 NRO23

Points: 1.00

The plant was at rated power when an ATWS occurred. The Operator placed the STANDBY LIQUID CONTROL keylock switch to the FIRE SYS 2 position.

If **ONLY ONE** of the Standby Liquid Control System 2 squibs actuated, which of the following states the impact on the SLC System's ability to inject into the RPV?

SLC System 2.....

- A. will inject at the normal rate.
- B. will **NOT** inject into the RPV.
- C. will inject at $\frac{1}{2}$ the normal rate.
- D. will inject less than the normal rate, but $> \frac{1}{2}$ the rate.

Answer: A

Answer Explanation

QID: 10-1 NRO23

Question # 23 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
211000 SLC K5.04 - Knowledge of the operational implications of the following concepts as they apply to STANDBY LIQUID CONTROL SYSTEM: Explosive valve operation				3.1	3.2
Level	RO	Tier	2	Group	1
General References	157B6350 Sh. 188	304			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>A is Correct. Placing the keylock switch in SYS 2 will fire both System 2 squibs and start only the system SLC pump (Pump B). Only actuation of a single squib in System 2 needs to function to allow full SLC System flow.</p> <p>B, C, and D are Incorrect. These distractors are plausible if the applicant does not recall that only one squib valve needs to fire for SLC to inject and develop full flow.</p>		
References to be provided during exam:	None		
Lesson Plan	2621.828.0.004, Standby Liquid Control System		
Learning Objective/	SLC-10446, Identify and explain system operating controls under all plant operating conditions.		

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified:			
VISION System/Question ID		609049 / IRL-21-28-0046 / PRT-10	
Question Source		ILT 07-1 Audit	
Cognitive Level	Memory or Fundamental Knowledge	X 1:I	Comprehension or Analysis
	NUREG 1021 Appendix B: Interlocks, setpoints, or system (singular) response		
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	211000	PRA:	NO
Safety Function:	1	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

24

ID: 10-1 NRO24

Points: 1.00

The plant was at rated power. An electrical transient resulted in the following annunciators on Panel 9XF:

9XF					
ELECTRIC					
VITAL POWER					
AC			DC		
PWR LOST		XFERS	PWR LOST	XFERS	
1		VLOP-1 PWR XFER	BUS AB UV		REMOTE SD TROUBLE
2		MCC-1AB2 PWR XFER	BUS C UV		
3	PROT SYS PNL1 PWR LOST	VACP-1 PWR LOST	VACP-1 PWR XFER	DC-D PWR LOST	DC-D PWR XFER
4	PROT SYS PNL2 PWR LOST	CIP-3 PWR LOST	CIP-3 PWR XFER	DC-1 PWR LOST	DC-E PWR XFER
5		IP-4 PWR LOST	CIP-3 INV AC INV LOST	BUS C INPUT BRKR'S OPEN	MCC-DC-1 PWR XFER
6		IP-4A PWR LOST	CIP-3 INV RSP INV DC INV LOST	DC-F PWR LOST	BAT B BRKR OPEN
7		IP-4B PWR LOST	IP-4 PWR XFER	24VDC PP-A PWR LOST	
8		IP-4C PWR LOST		24VDC PP-B PWR LOST	BUS AB GROUND
	a	b	c	d	e

Which of the following describes the status of CIP-3?

CIP-3 is...

- A. **DE-ENERGIZED.**
- B. **ENERGIZED** via VMCC-1A2.
- C. **ENERGIZED** from the Rotary Inverter via DC-B.
- D. **ENERGIZED** from the Rotary Inverter via VMCC-1B2.

Answer: B

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Answer Explanation

QID: 10-1 NRO24

Question #	24	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A					Importance Rating	
					RO	SRO
262002 UPS (AC/DC) A3.01 - Ability to monitor automatic operations of the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) including: Transfer from preferred to alternate source					2.8	3.1
Level	RO	Tier	2	Group	1	
General References	BR 3013		RAP-9XF4c		RAP-9XF6c	
Explanation	B is Correct. The question stem provides annunciators that indicate CIP-3 has transferred to its alternate power source of VMCC-1A2. CIP-3 is normally powered from the Rotary Inverter which has a normal (AC from VMCC-1B2) and backup (DC from DC-B) power supply. Both annunciators 9XF-4-c and 9XF-6-c indicate the Rotary Inverter has lost all power. In this instance, Automatic Transfer Switch (ATS) IT-3 will automatically transfer, re-powering CIP-3 from VMCC-1A2, its alternate source of power.					
	A is Incorrect. This distractor is plausible if the applicant misinterprets the annunciator indications and believes that CIP-3 is now de-energized.					
	C is Incorrect. This distractor is plausible if the applicant misinterprets the annunciator indications and believes that the Rotary Inverter just lost its AC power source (VMCC-1B2).					
	D is Incorrect. This distractor is plausible if the applicant misinterprets the annunciator indications and believes that the Rotary Inverter just lost its DC power source (DC-B).					
References to be provided during exam:			None			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Lesson Plan	2621.828.0.0056, Vital AC Distribution System
Learning Objective/	VAC-10445, Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.

Question Source (New, Modified, Bank)		New	
If Bank or Modified: VISION System/Question ID Question Source		N/A	
Cognitive Level	Memory or Fundamenta l Knowledge		Comprehension or Analysis
	X 3:SPK		
NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	262002	PRA:	NO
Safety Function:	6	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

25

ID: 10-1 NRO25

Points: 1.00

The plant was at rated power. The following indications for EDG-1 were observed for several minutes on Panel 8F/9F:

- BREAKER OPEN light is LIT
- BREAKER CLOSED light is OFF
- UNIT IDLING light is LIT
- UNIT START light is OFF

Which of the following plant parameters would result in the above EDG-1 indications?

- A. Drywell Pressure indicates 2.7 psig
- B. RPV Water Level indicates 95 inches
- C. 4160 VAC Bus 1C indicates 2500 Volts
- D. EDG-1 Lube Oil Temperature is 80° F

Answer: D

Answer Explanation

QID: 10-1 NRO25		
Question #	25	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
264000 EDGs A1.01 - Ability to predict and/or monitor changes in parameters associated with operating the EMERGENCY GENERATORS (DIESEL/JET) controls including: Lube oil temperature				3.0	3.0
Level	RO	Tier	2	Group	1
General References	341	3E-861-21-1002			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>D is Correct. The question stem provides indications of an EDG-1 Idle Start. Conditions which will Idle Start and EDG are High Drywell Pressure (>3psig, 2.9psig setpoint), RPV Lo-Lo Water Level (<86", 90" setpoint), and EDG Lo Lube Oil Temperature (\leq 85F).</p> <p>A is Incorrect. This distractor is plausible if the applicant does not recall the correct EDG Idle Start logic.</p> <p>B is Incorrect. This distractor is plausible if the applicant does not recall the correct EDG Idle Start logic.</p> <p>C is Incorrect. This distractor is plausible if the applicant does not recall the correct EDG Idle Start logic. It is true that the EDG will Fast Start, however during a Fast Start, the UNIT START light will be LIT, not OFF, as indicated in the question stem.</p>
References to be provided during exam:	None
Lesson Plan	2621.828.0.0013, Emergency Diesel Generators
Learning Objective/	EDG-10444, Describe the interlock signals and setpoints for the affected system components and expected system response including power loss or failed components.

Question Source (New, Modified, Bank)			New	
If Bank or Modified: VISION System/Question ID Question Source		N/A		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPK
	NUREG 1021 Appendix B: <u>S</u> olve a <u>P</u> roblem using <u>K</u> nowledge and its meaning			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

10CRF55 Content	55.41	5	55.43	
	Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.			
Justification for LORT questions with K/A values < 3.0	N/A			
Time to Complete: 1-2 minutes		Point Value: 1		
System ID No.:	264000	PRA:	NO	
Safety Function:	6	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

26

ID: 10-1 NRO26

Points: 1.00

At Time = 0 seconds, the plant was at rated power when a LOCA occurred.

At Time = 30 seconds, the following conditions exist:

- RPV Pressure indicates 500 psig and lowering
- Annunciator ADS TIMER A START I **AND** ADS TIMER A START II came into alarm
- Annunciator ADS TIMER B START I **AND** ADS TIMER B START II came into alarm
- All EMRVs indicate **GREEN** light **ON**
- Core Spray Booster Pumps C **AND** D indicate **GREEN** light **ON**

At Time = 105 seconds, an operator placed **BOTH** ADS Timers in BYPASS.

At Time = 107 seconds, how many EMRVs will indicate **RED** light **ON**?

- A. 0
- B. 2
- C. 3
- D. 5

Answer: A

Answer Explanation

QID: 10-1 NRO26

Question # 26 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
218000 ADS 2.4.47 - Emergency Procedures / Plan: Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.				4.2	4.2
Level	RO	Tier	2	Group	1

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

General References	729E182	RAP-B1g RAP-B4g	ADS Lesson Plan
Explanation	<p>A is Correct. The plant was at power when a LOCA occurred. With all ADS TIMER START annunciators alarming, then the logic to open the EMRVs has been satisfied and a 105 second timer is counting down. When the times makes it to 0, then 2 EMRVs open immediately, 1 EMRV will open at 1.5 seconds later, and 2 EMRVs will open at the 3.25 second later mark. At Time = 107 seconds, the ADS timers have only counted down for 77 seconds, therefore NO EMRVs will be open. This question tests the K/A and examines the applicant's ability to use procedures in a timely manner in order to inhibit ADS IAW EOPs and examines their knowledge of trending by testing their knowledge on how long they have before EMRVs open when ADS logic is satisfied.</p> <p>B is Incorrect. This distractor is plausible if the applicant does not add 30 seconds to the 105 second time delay and believes only 2 EMRVs will be open.</p> <p>C is Incorrect. This distractor is plausible if the applicant does not add 30 seconds to the 105 second time delay since 3 EMRVs will be open 107 seconds after ADS Timers have started counting down.</p> <p>D is Incorrect. This distractor is plausible if the applicant does not recall that the EMRVs open on a staggered time delay and believes all EMRVs will be open.</p>		
References to be provided during exam:	None		
Lesson Plan	2621.828.0.0005, Automatic Depressurization System		
Learning Objective/	<p>ADS-379, Describe the operation of the ADS controls including: 1) Resetting ADS timers; 2) Bypassing ADS timers; 3) Disabling ADS; 4) Clearing and resetting ADS auto initiation signals; 5) Removal of ADS control logic fuses to close EMRVs; 6) Obtaining readings from EMRV temperature indicators</p>		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Question Source (New, Modified, Bank)		Modified	
If Bank or Modified:			
VISION System/Question ID		663297 / ADS-IRH-001	
Question Source		ILT 08-1 NRC RO#9	
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis
	X 3:PEO		
NUREG 1021 Appendix B: Predict an Event or Outcome			
10CRF55 Content	55.41	10	55.43
	Administrative, normal, abnormal, and emergency operating procedures for the facility.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	218000	PRA:	NO
Safety Function:	3	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

27

ID: 10-1 NRO27

Points: 1.00

Which of the following would **REQUIRE** entry into the Secondary Containment Control EOP?

- A. RB Δ P LO annunciator is at the alarm setpoint
- B. B-7, TIP VALVE AREA, on Panel 2R above MAX NORMAL
- C. Off-Site Radioactivity Release Rate above the ALERT level
- D. IB-13-A, TRUNNION ROOM EAST END RB ELEV 23 FT, indicates 140°F

Answer: B

Answer Explanation

QID: 10-1 NRO27

Question # 27 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
215001 Traversing In-core Probe K1.10 - Knowledge of the physical connections and/or cause- effect relationships between TRAVERSING IN-CORE PROBE and the following: Area radiation monitoring system: (Not-BWR1)				2.6	2.8
Level	RO	Tier	2	Group	2
General References	SCC EOP	EOP User's Guide		RAP-L6c	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>B is Correct. IAW the Secondary Containment Control EOP, ARM B-7 above the Max Normal requires entry into Secondary Containment Control. This ARM is installed specifically to determine radiation abnormalities associated with the TIP system. The indication for this alarm is on Panel 2R in the Control Room.</p> <p>A is Incorrect. The RB ΔP LO annunciator alarms at - 0.14" H₂O. The EOP entry into SCC is ≥ 0" H₂O. This distractor is plausible if the applicant does not recall the alarm setpoint is slightly less than the EOP setpoint in order to give the operator time to restore RB ΔP before entry into SCC is required.</p> <p>C is Incorrect. This is an entry into Radioactivity Release Control (which is contained on the same flowchart printout as SCC). This distractor is plausible if the applicant is confused by which EOP this condition requires entry into.</p> <p>D is Incorrect. The Trunnion Room East temperature EOP entry is at 160°F. This distractor is plausible if the applicant does not recall the Max Normal setpoint for this temperature indication.</p>
References to be provided during exam:	None
Lesson Plan	2621.828.0.033A, Plant Radiation Monitoring System
Learning Objective/	RAD-3025, Given key plant parameters, determine if entry conditions for the EOPs have been met and which, if any, EOP should be entered first for these conditions.

Question Source (New, Modified, Bank)		New	
If Bank or Modified: VISION System/Question ID Question Source		N/A	
Cognitive Level	Memory or Fundamental Knowledge	X 1:P	Comprehension or Analysis
	NUREG 1021 Appendix B: Procedure steps and cautions		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

10CRF55 Content	55.41	11	55.43	
	Purpose and operation of radiation monitoring systems, including alarms and survey equipment.			
Justification for LORT questions with K/A values < 3.0	N/A			
Time to Complete: 1-2 minutes		Point Value: 1		
System ID No.:	215001	PRA:	NO	
Safety Function:	7	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

28

ID: 10-1 NRO28

Points: 1.00

A loss of which of the following power supplies will render the Alternate Rod Injection (ARI) System INOPERABLE?

- A. DC-E
- B. DC-2
- C. VACP-1
- D. PAIPP-1

Answer: A

Answer Explanation

QID: 10-1 NRO28		
Question #	28	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information						
K&A					Importance Rating	
					RO	SRO
201001 CRD Hydraulic K2.05 - Knowledge of electrical power supplies to the following: Alternate rod insertion valve solenoids: Plant-Specific					4.5	4.5
Level	RO	Tier	2	Group	2	
General References		BR E0578		ABN-53		
Explanation		A is Correct. The power supply to the ARI system valve solenoids is DC-E. ARI initiation logic is energize to activate, therefore it requires power from DC-E or it will not operate.				
		All distractors are Incorrect but plausible sources of vital power.				
		NOTE: This question was changed to Low Cog from High Cog due to the maximum number of High Cog questions on the RO exam (45 max allowed by NUREG - 1021).				
References to be provided during exam:			None			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Lesson Plan	2621.828.0.0011, Control Rod Drive Hydraulic System
Learning Objective/	CRD-2010, Describe the initiation logic for the Alternate Rod Injection (ARI) System including signals and setpoints.

Question Source (New, Modified, Bank)		New	
If Bank or Modified: VISION System/Question ID Question Source		N/A	
Cognitive Level	Memory or Fundamental Knowledge	X 1:F	Comprehension or Analysis
	NUREG 1021 Appendix B: Facts		
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	201001	PRA:	NO
Safety Function:	1	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

29

ID: 10-1 NRO29

Points: 1.00

The plant was at rated power when an event then occurred. **5 seconds later**, plant conditions were observed to include the following:

- Annunciator MSIV CLOSED I is in alarm
- Annunciator MSIV CLOSED II is in alarm
- Panel 4F RPS 1 SCRAM SOLENOIDS lights are lit
- Panel 4F RPS 2 SCRAM SOLENOIDS lights are lit
- APRM power indicates 92% and lowering
- Torus temperature indicates 90°F and rising
- Drywell Pressure indicates 14 psig and rising
- RPV water level indicates 178 inches and rising

Based on these conditions, which of the following are in service and controlling RPV pressure? (Assume **NO** operator actions had been taken following the event)

1. EMRVs
 2. Safety Valves
 3. Isolation Condensers
- A. 1 **ONLY**
- B. 1 and 2 **ONLY**
- C. 1 and 3 **ONLY**
- D. 1, 2, **AND** 3

Answer: D

Answer Explanation

QID: 10-1 NRO29		
Question #	29	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information		
K&A	Importance Rating	
	RO	SRO

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

239001 Main and Reheat Steam						
K3.16 - Knowledge of the effect that a loss or malfunction of the MAIN AND REHEAT STEAM SYSTEM will have on following: Relief/safety valves					3.6	3.6
Level	RO	Tier	2	Group	2	
General References		420	BR 2002			
Explanation		<p>D is Correct. The question stem provides indications of an MSIV isolation (loss of the Main Steam System) combined with an Electrical ATWS. With an RPV Isolation and reactor power still at 92% power, RPV Pressure is being controlled by the ICs, EMRVs, and Safety Valves. ICs can remove a combined 6% steam demand, all 5 EMRVs remove 40% steam flow (to the Torus), and the remaining 46% steam demand is being discharged to the Drywell air space (Drywell pressure rising). This question matches the K/A by testing the response of the Relief/Safety valves during a loss of the Main Steam System in an ATWS condition.</p> <p>A, B, and C are Incorrect. These distractors are plausible if the applicant does recognize from the stem indications that both ICs and Safety valves are also in operation. ICs are not supposed to be manually initiated > 160". In this instance they would have automatically initiated. EMRVs are in every answer choice since it is low difficulty that the applicant would recognize that at least EMRVs would be in operation.</p>				
References to be provided during exam:		None				
Lesson Plan		2621.828.0.0026, Main Steam System				
Learning Objective/		MSS-10453, Explain or describe how this system is interrelated with other plant systems.				

Question Source (New, Modified, Bank)	New
If Bank or Modified:	N/A
VISION System/Question ID	
Question Source	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 2:RI
	NUREG 1021 Appendix B: Recognizing Interaction between systems (plural), including consequences and implications			
10CRF55 Content	55.41	7	55.43	
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	239001	PRA:	NO	
Safety Function:	3	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

30

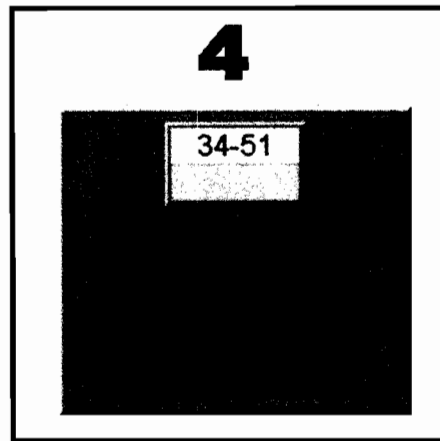
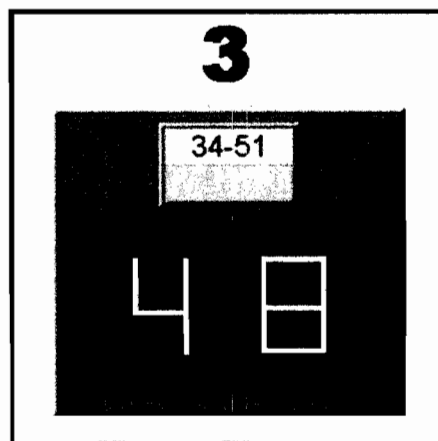
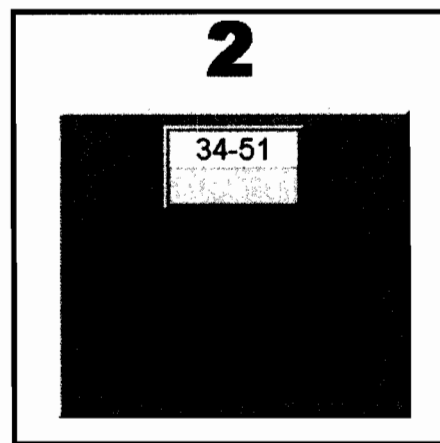
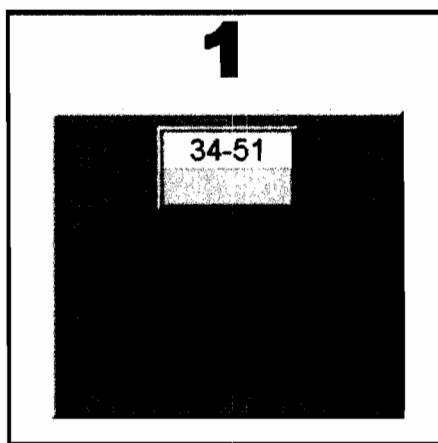
ID: 10-1 NRO30

Points: 1.00

A reactor startup is in progress. Control Rod 34-51 is being withdrawn to position 48. Upon reaching position 48 the following annunciator came into alarm:

- ROD OVERTRAVEL

Which of the following indications on Panel 4F would confirm Control Rod 34-51 is uncoupled?



- A. 1
B. 2
C. 3
D. 4

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Answer: B

Answer Explanation		
QID: 10-1 NRO30		
Question #	30	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
201003 Control Rod and Drive Mechanism K4.02 - Knowledge of CONTROL ROD AND DRIVE MECHANISM design feature(s) and/or interlocks which provide for the following: Detection of an uncoupled rod				3.8	3.9
Level	RO	Tier	2	Group	2
General References	302.2				
Explanation	<p>B is Correct. IAW 302.2, Control Rod Drive Manual Control System, if a control rod became uncoupled, the rod position display (on Panel 4F) will go dark (black with no position indication) and the ROD OVERTRAVEL alarm (H5a) will annunciate. These design features are what the applicant will use to detect if an uncoupled control rod condition exists.</p> <p>All distractors are incorrect but plausible since they are control rod display indications under conditions other than an uncoupled rod.</p>				
References to be provided during exam:	None				
Lesson Plan	2621.828.0.0011, Control Rod Drive and Hydraulics				
Learning Objective/	CRD-10460, Discribe the CRDM design features and/or interlocks which provide for the detection of an uncoupled control rod.				

Question Source (New, Modified, Bank)	New
If Bank or Modified: VISION System/Question ID Question Source	N/A

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPK
	NUREG 1021 Appendix B: <u>S</u>olve a <u>P</u>roblem using Knowledge and its meaning			
10CRF55 Content	55.41	7	55.43	
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	201003	PRA:	NO	
Safety Function:	1	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

31

ID: 10-1 NRO31

Points: 1.00

The plant was at power when Reactor Recirc Pump 'A' began to coast down and trip.

Which of the following would cause this event? (Assume all choices below reference the 'A' Recirc Pump MG Set)

- A. A loss of speed control signal to the Bailey Scoop Tube Positioner.
- B. A loss of the instrument air signal to the Bailey Scoop Tube Positioner.
- C. A complete speed feedback signal failure to the MG Set voltage regulator.
- D. A loss of power to the Recirc Pump MG Set Moore Controller on Panel 3F.

Answer: C

Answer Explanation

QID: 10-1 NRO31

Question # 31 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
202002 Recirculation Flow Control K5.02 - Knowledge of the operational implications of the following concepts as they apply to RECIRCULATION FLOW CONTROL SYSTEM : Feedback signals				2.6	2.6
Level	RO	Tier	2	Group	2
General References	RFC Lesson Plan		GE 148F961		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	C is Correct. The MG Set Tachometer provides a feedback signal to the MG Set Voltage Regulator. A complete loss of the Speed Feedback signal to the MG Set Voltage Regulator will result in the MG Set Main Exciter amps lowering to the point where the MG Field Breaker will trip on undervoltage.		
	A is Incorrect. This will result in a Scoop Tube lockup. This distractor is plausible if the applicant does not recognize what happens to the Recirc Pump on a loss of speed control signal from DFRCS to the Bailey Scoop Tube Positioner.		
	B is Incorrect. This will result in a Scoop Tube lockup. This distractor is plausible if the applicant does not recognize what happens to the Recirc Pump on a loss of air signal from DFRCS to the Bailey Scoop Tube Positioner.		
	D is Incorrect. This will result in the automatic transfer to Local-Manual control of the MG Set. This distractor is plausible if the applicant believes the Recirc Pump will trip on a loss of power to its Moore controller.		
References to be provided during exam:		None	
Lesson Plan	2621.828.0.0040, Recirc Flow Control System		
Learning Objective/	RFC-158, Describe the following components associated with the Recirc Flow Control System, including location, purpose, construction, operation, and power supply: 1) Tachometer, 2) Fluid Coupler, 3) Bailer Positioner, 4) Air Failure Brake, 5) Individual Flow Controller, 6) Master Flow Controller, 7) Transfer of Control Logic, 8) Digital Control Computers, 9) MG Set Drive Motor, 10) MG Set Variable Speed Generator, 11) DC Exciter		

Question Source (New, Modified, Bank)		New		
If Bank or Modified: VISION System/Question ID Question Source		N/A		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 2:DR

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

	NUREG 1021 Appendix B: Describing or recognizing Relationships		
10CRF55 Content	55.41	5	55.43
	Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.		
Justification for LORT questions with K/A values < 3.0	N/A		
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	202002	PRA:	NO
Safety Function:	1	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

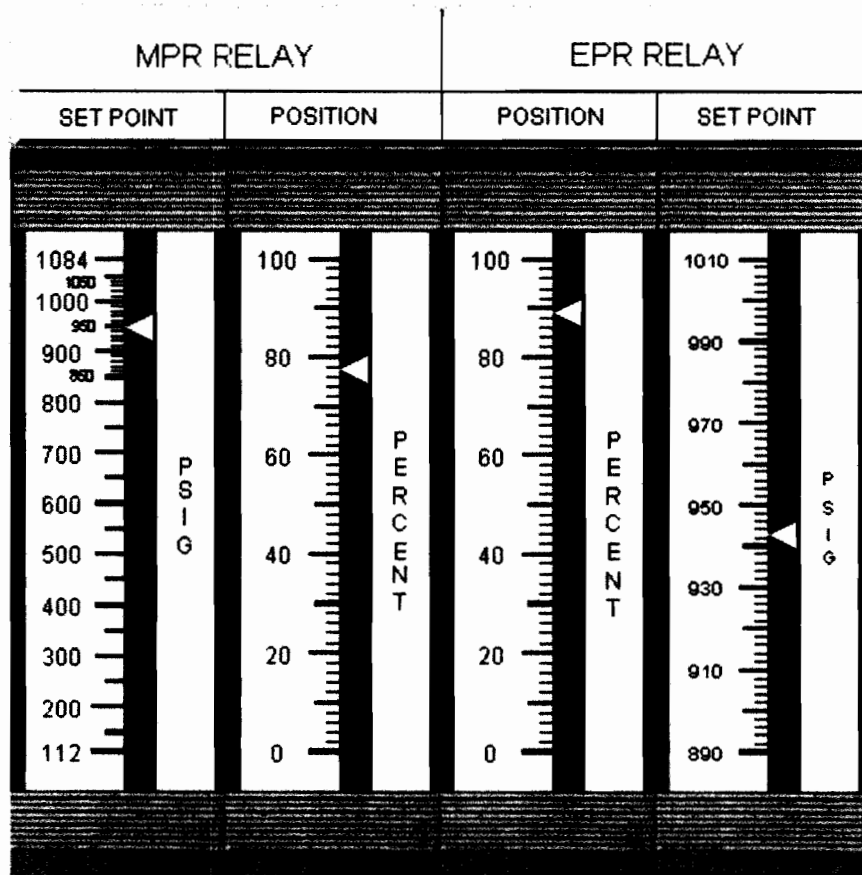
ILT 10-1 NRC RO Exam

32

ID: 10-1 NRO32

Points: 1.00

The plant is at rated power. Panel 7F indications include the following:



The steam sensing line to the EPR then breaks. What is the effect on Turbine Control Valves (TCVs) **AND** RPV Pressure from the break?

TCVs will...

RPV Pressure will...

- | | | |
|----|-------|---|
| A. | open | LOWER to 890 psig |
| B. | close | RISE until the MPR takes control |
| C. | open | LOWER until the MPR takes control |
| D. | close | RISE to the RPS high pressure scram setpoint |

Answer: B

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Answer Explanation						
QID: 10-1 NRO32						
Question #	32		Developer / Date: JJR / 7-11-11			
Knowledge and Ability Reference Information						
K&A					Importance Rating	
					RO	SRO
241000 Reactor/Turbine Pressure Regulating System K6.07 - Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR/TURBINE PRESSURE REGULATING SYSTEM: Turbine inlet pressure					3.4	3.4
Level	RO	Tier	2	Group	2	
General References		ABN-9				
Explanation		B is Correct. The question stem provides indications of a loss of steam flow input to the EPR which is the same as turbine inlet pressure. This will tell the EPR that RPV pressure is lowering (which it is trying to remain constant). The EPR will then close TCVs which will raise RPV Pressure. When the EPR Relay Setpoint exceeds the MPR relay setpoint, the MPR will take control of the Turbine Control System.				
		A is Incorrect. This distractor is plausible if the applicant is confused on the operation of the Turbine Control System. The value of 890 psig is plausible since this is where steam header pressure will stabilize if the TCVs failed open (and it's the bottom EPR Relay setpoint indication on Panel 7F).				
		C is Incorrect. This distractor is plausible if the applicant does not recognize this malfunction will result in TCVs closing to raise RPV pressure.				
		D is Incorrect. This distractor is plausible if the applicant does not believe the MPR will take control of RPV pressure before reaching the high RPV pressure scram setpoint.				
References to be provided during exam:		None				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Lesson Plan	2621.828.0.0051, Turbine Controls
Learning Objective/	TCS-10441, Given the system logic/electrical drawings, describe the system trip signals, setpoints and expected system response including power loss or failed components.

Question Source (New, Modified, Bank)		Modified	
If Bank or Modified:		507200	
VISION System/Question ID		448 (old OC LORT Bank)	
Question Source			
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis
			X 3:PEO
NUREG 1021 Appendix B: Predict an Event or Outcome			
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	241000	PRA:	NO
Safety Function:	3	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

33

ID: 10-1 NRO33

Points: 1.00

The plant was at rated power when an event resulted in a high Drywell pressure condition. Present plant conditions are as follows:

- Containment Spray Pump 51B and ESW Pump 52B are running in the Drywell Spray Mode
- Containment Spray Pump 51D and ESW Pump 52D are running in the Torus Cooling Mode

The following annunciator then alarms:

- LKOUT RELAY 86/S1B TRIP

Which of the following states the impact on the operating Containment Spray/ESW Pumps?

	<u>Containment Spray/ESW B</u>	<u>Containment Spray/ESW D</u>
A.	<ul style="list-style-type: none">• Both pumps trip• Both pumps can be immediately restarted	<ul style="list-style-type: none">• Both pumps remain running
B.	<ul style="list-style-type: none">• Both pumps remain running	<ul style="list-style-type: none">• Both pumps trip• Containment Spray Pump can be restarted after 200 seconds• ESW Pump can NOT be restarted
C.	<ul style="list-style-type: none">• Both pumps trip• Containment Spray Pump can be restarted after 200 seconds• ESW Pump can NOT be restarted	<ul style="list-style-type: none">• Both pumps trip• Both pumps can be immediately restarted
D.	<ul style="list-style-type: none">• Both pumps remain running	<ul style="list-style-type: none">• Both pumps trip• Both pumps can be restarted after 200 seconds

Answer: D

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Answer Explanation		
QID: 10-1 NRO33		
Question #	33	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
219000 RHR/LPCI: Torus/Suppression Pool Cooling Mode A1.07 - Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE controls including: Emergency generator loading				3.2	3.3
Level	RO	Tier	2	Group	2
General References	341	RAP-S1c		237E901	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>D is Correct. The plant was at rated power when an event occurred resulting in a high Drywell pressure condition. B Containment Spray Loop is in the Drywell Spray mode, and D Containment Spray Loop is in the Torus cooling mode. The annunciator provided shows that startup transformer S1B has tripped. It had been supplying 4160 Bus 1B, and Bus 1D (and Bus 1B2). When the transformer trips, Bus 1B becomes de-energized and EDG 2 starts and loads onto Bus 1D. Thus, Bus 1B is de-energized and EDG 2 is supplying Bus 1D (and Bus 1B2).</p>	
	<p>Loop B pumps are powered from 4160 Bus 1C (ESW pump) and Bus 1A2 (from Bus 1C for the Containment Spray pump). Both these busses are still powered from startup transformer S1A and are unaffected by the loss of the other startup transformer. Therefore, the Loop B pumps remain running.</p>	
	<p>Loop D pumps are powered from 4160 Bus 1D (ESW pump) and Bus 1B2 (from Bus 1D for the Containment Spray pump). Both these busses were initially powered from startup transformer S1B, which has been lost. Since Bus 1D has been re-powered by the EDG, ESW Pump D has power. EDG 2 immediately started and loaded onto Bus 1D. But, to prevent EDG loading concerns, the manual start of any containment spray pump and ESW pump on Bus 1D is prevented for 200 seconds after the EDG picks up the bus.</p>	
	<p>Therefore: Loop B pumps remain running, Loop D ESW Pump trips and can be re-started in 200 seconds, and containment spray pump D trips and can be manually restarted after 200 seconds.</p> <p>A, B, & C are Incorrect but plausible if the candidate does not know the meaning of the provided alarm, electrical distribution or the associated logic.</p>	
References to be provided during exam:	None	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Lesson Plan	2621.828.0.0009, Containment Spray/ESW System
Learning Objective/	CNS-10446, Identify and explain system operating controls/indications under all plant operating conditions.

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified: VISION System/Question ID		663341 / CNS-IRH-001		
Question Source		ILT 08-1 NRC RO EXAM		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 2:RI
	NUREG 1021 Appendix B: Recognizing Interaction between systems (plural), including consequences and implications			
10CRF55 Content	55.41	5	55.43	
	Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	219000	PRA:	NO	
Safety Function:	5	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

34

ID: 10-1 NRO34

Points: 1.00

The plant was at rated power when a common mode failure causes all Reactor Recirc flow controllers to drop to minimum frequency. Current plant conditions include the following:

- All APRM indications are cycling between 38 - 51%
- TOTAL RECIRC FLOW indicates 6.9×10^4 gpm

Which of the following actions is required **NEXT** and for what reason?

	<u>Action is to...</u>	<u>Reason is for...</u>
A.	manually scram the reactor.	power oscillations.
B.	insert rods or raise recirc flow.	entering the Exclusion Zone.
C.	manually scram the reactor.	multiple Recirc Pump trip.
D.	maintain a heightened awareness of Plant Parameters.	entering the Buffer Zone.

Answer: A

Answer Explanation

QID: 10-1 NRO34

Question # 34 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
202001 Recirculation A2.06 - Ability to (a) predict the impacts of the following on the RECIRCULATION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Inadvertent recirculation flow decrease				3.6	3.8
Level	RO	Tier	2	Group	2

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

General References	202.1		
Explanation	A is Correct. The question stem provides a condition where a Recirculation System failure resulted in Recirculation Flow lowering rapidly to minimum frequency (which is 11 Hz). With Reactor Power cycling between 38-51% (and at 45% avg) and Recirc Flow at 6.9x10E4, the plant is in the Buffer Zone however there are also power oscillations that resulted which are greater than $\pm 5\%$ on ≥ 2 APRMs. Procedure 202.1 then requires a reactor scram IAW ABN-1. Power oscillations are a major concern in high power low flow conditions and is the reason this is the first item an operator analyzes when recirculation flow lowers less than 8.5x10E4 gpm.		
	B is Incorrect. This distractor is plausible if the applicant does recognize that power ocillations exist and believes the plant has entered the Exclusion Zone.		
	C is Incorrect. This distractor is plausible if the applicant believes conditions have been met for a loss of multiple Recirc Pumps and a scram is required IAW ABN-2, Recirc Flow Abnormalities.		
	D is Incorrect. This distractor is plausible if the applicant does not recognize power oscillations exist greater than that required to scram by procedure. It is true the Buffer Zone has been entered which also makes this distractor plausible.		
References to be provided during exam:		Attachment 202.1-2	NOTE: This reference is also provided for RO question #15
Lesson Plan	2621.828.0.0038, Reactor Recirculation System		
Learning Objective/	RRS-10445, Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.		

Question Source (New, Modified, Bank)	Modified
If Bank or Modified:	
VISION System/Question ID	506449
Question Source	RFC-13

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPR
	NUREG 1021 Appendix B: Solve a Problem using References			
10CRF55 Content	55.41	5	55.43	
	Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	202001	PRA:	NO	
Safety Function:	1	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

35

ID: 10-1 NRO35

Points: 1.00

The plant is shutdown and fuel shuffling is taking place. The following annunciator is then received in the Control Room:

- ROD CNTRL – ROD BLOCK

Which of the following states the cause of this alarm?

- A. The Main Fuel Hoist was just loaded with a fuel bundle over the core.
- B. The Monorail Auxiliary Hoist was just loaded with a control rod blade over the core.
- C. The Main Fuel Hoist was positioned on a fuel bundle when the grapple ENGAGED light went **ON**.
- D. The Main Fuel Hoist was loaded with fuel in the Spent Fuel Pool when a control rod was withdrawn to position 02.

Answer: A

Answer Explanation

QID: 10-1 NRO35

Question # 35 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
234000 Fuel Handling Equipment A3.02 - Ability to monitor automatic operations of the FUEL HANDLING EQUIPMENT including: †Interlock operation				3.1	3.7
Level	RO	Tier	2	Group	2
General References	UFSAR Table 7.7-1				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	A is Correct. The plant is shutdown and fuel shuffling is underway. When the hoist loaded light comes on, this means that the hoist is loaded with fuel (as sensed by the load cell). When the hoist is loaded with fuel over the core, a control rod block is installed.		
	B is Incorrect but plausible. Even with the bridge over the core, a loaded Monorail Auxiliary Hoist does not install a control rod block.		
	C is Incorrect but plausible. There is not yet any load on the fuel hoist, even though it is positioned over the core. The grapple engaged light verifies that the grapple is closed. It does not input into the rodblock circuit.		
	D is Incorrect but plausible. A loaded hoist in the Spent Fuel Pool does not create a control rod block nor does a single control rod withdrawn to position 02.		
References to be provided during exam:		None	
Lesson Plan	2621.812.0.0003, Refueling		
Learning Objective/	RFL-2391, Demonstrate understanding of the interlocks and rod blocks associated with the following refueling platform components, including their purpose and applicable technical specifications: bridge and trolley, main hoist, aux. hoist.		

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified: VISION System/Question ID Question Source		609313 ILT 07-1 NRC RO EXAM	
Cognitive Level	Memory or Fundamental Knowledge	X 1:I	Comprehension or Analysis
	NUREG 1021 Appendix B: Interlocks, setpoints, or system (singular) response		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

10CRF55 Content	55.41	7	55.43	
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			
Justification for LORT questions with K/A values < 3.0	N/A			
Time to Complete: 1-2 minutes		Point Value: 1		
System ID No.:	234000	PRA:	NO	
Safety Function:	8	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

36

ID: 10-1 NRO36

Points: 1.00

The plant was at rated power when an ATWS occurred. Plant conditions include the following:

- The 'A' Reactor Feed Pump (RFP) is being placed in operation IAW SP-19, Feedwater/Condensate And CRD System Operation
- The BOP momentarily places the FEED PUMP 1A control switch to the START position
- The 'A' Reactor Feed Pump fails to start and annunciator FEED PUMP TRIP A comes into alarm

Which of the following would cause this condition?

- A. 'A' RFP shaft shear has occurred.
- B. 'A' RFP Aux Lube Oil Pump did **NOT** start.
- C. Reactor vessel water level is 165 inches above TAF.
- D. 120 VAC Control Power to starting circuitry is **NOT** available.

Answer: B

Answer Explanation

QID: 10-1 NRO36

Question # 36 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A					Importance Rating	
					RO	SRO
259001 Reactor Feedwater A4.02 - Ability to manually operate and/or monitor in the control room: Manually start/control a RFP/TDRFP					3.9	3.7
Level	RO	Tier	2	Group	2	
General References	RAP-J1d		223R0173 Sh. 7		157B6350 Sh. 184a	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>B is Correct. Since the lube oil permissive is required to start a feed pump taking the control switch to normal after start will close 7/7T and 9T/9. With the breaker open 52 3/3C is closed causing 30T to annunciate. The pump will not start because PSX1 contact did not close in the starting circuit.</p> <p>A is Incorrect but plausible. There is nothing in the trip circuitry which will trip the pump on a pump shaft shear. A seized shaft on the other hand would cause an overcurrent. The operator must have this knowledge to rule out this distractor.</p> <p>C is Incorrect but plausible. Although the ROPS would be a plausible answer it does not come into play until 181 inches. The operator must understand this is high end of the normal water level band.</p> <p>D is Incorrect but plausible since there are other large breakers in the plant that utilize 120 VAC for breaker control power.</p>
References to be provided during exam:	None
Lesson Plan	2621.828.0.0017, Feed and Condensate System
Learning Objective/	CFW-10449, State the function and interpretation of system alarms, alone and in combination, as applicable in accordance with the system RAPS.

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified: VISION System/Question ID Question Source		505913 FEED & COND-36	
Cognitive Level	Memory or Fundamental Knowledge	X 1:I	Comprehension or Analysis
	NUREG 1021 Appendix B: Interlocks, setpoints, or system (singular) response		
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Justification for LORT questions with K/A values < 3.0	N/A		
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	259001	PRA:	NO
Safety Function:	2	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

37

ID: 10-1 NRO37

Points: 1.00

The plant had reached the point of adding heat during a startup and has established a stable heatup rate. LETDOWN FLOW CONTROLLER FCV-ND22 was open to 20%.

If the airline to ND22 broke off, which of the following states the impact on RPV water level control and the corrective action to mitigate this impact?

	<u>Impact on RPV Water Level</u>	<u>Corrective Action</u>
A.	Lowers	Increase makeup to the RPV
B.	Rises	Open V-16-57, LETDOWN TO RADWASTE
C.	Rises	Limit makeup to the RPV
D.	Lowers	Close V-16-60, LETDOWN TO CONDENSER

Answer: C

Answer Explanation

QID: 10-1 NRO37

Question #	37	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
204000 RWCU 2.1.28 - Conduct of Operations: Knowledge of the purpose and function of major system components and controls.				4.1	4.1
Level	RO	Tier	2	Group	2
General References	ABN-35				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>C is Correct. During a startup with a heatup underway, RPV water level will rise due to thermal expansion. RPV water level control is through ND22 to the condenser. When air is lost to this valve, it fails closed. As the heatup continues, RPV water level will rise. The only course of action until letdown can be re-established is to limit makeup into the RPV. The applicant must have knowledge of the purpose and function of ND-22 (a major system component in the RWCU system) in order to answer this question.</p> <p>A & D are Incorrect but plausible since water level rises, not lower.</p> <p>B is Incorrect but plausible. Letdown to radwaste is downstream of ND22, which means that opening the radwaste letdown path will have no flow, and thus no impact on water level.</p>
References to be provided during exam:	None
Lesson Plan	2621.828.0.0039, Reactor Water Cleanup
Learning Objective/	SDC-10435, Given plant operating conditions, describe or explain the purpose(s)/function(s) of the system and its components.

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified:			
VISION System/Question ID		609072	
Question Source		ILT 07-1 RO Audit Exam	
Cognitive Level	Memory or Fundamental Knowledge	X 1:F 1:P	Comprehension or Analysis
	NUREG 1021 Appendix B: Facts; Procedure steps and cautions		
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		
Justification for LORT questions with K/A values < 3.0		N/A	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	204000	PRA:	NO
Safety Function:	2	<input checked="checked" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

38

ID: 10-1 NRO38

Points: 1.00

The plant was at rated power. I&C then informed the Control Room that **ALL** Lo-Lo-Lo Level Barton (RE-18A, 18B, 18C, and 18D) level instruments are frozen at 160 inches TAF and will **NOT** provide the correct level indication.

A primary coolant leak then developed outside of the Drywell.

If RPV water level lowered to 50 inches TAF, which of the following statements is correct?

- A. MSIVs are OPEN.
- B. EDGs are in STANDBY.
- C. RBCCW to the Drywell is in service.
- D. RWCU system isolation valves are OPEN.

Answer: C

Answer Explanation

QID: 10-1 NRO38		
Question #	38	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
216000 Nuclear Boiler Instrumentation K3.02 - Knowledge of the effect that a loss or malfunction of the NUCLEAR BOILER Instrumentation will have on following: PCIS/NSSSS				4.0	4.3
Level	RO	Tier	2	Group	2
General References	148F712	UFSAR Pg. 9.2-18		RVI Lesson Plan	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>C is Correct. The Lo-Lo-Lo Bartons provide an isolation signal for RBCCW to the Drywell and also have an input into ADS logic. Both Lo-Lo-Lo Bartons being isolated will prevent them from actuating. Note that a High Drywell Pressure input AND Lo-Lo Level input will isolate RBCCW to the Drywell also, however the question stem states that the leak is outside of the Drywell so it can be assumed that Drywell pressure is unaffected by the leak.</p> <p>A, B, and D are Incorrect. The Lo-Lo-Lo Bartons do not provide input for EDG start, MSIV closure, or RWCU system isolation. The logic for this comes off other vessel level instrumentation. These distractors are plausible if the applicant does not recall this information.</p>		
References to be provided during exam:	None		
Lesson Plan	2621.828.0.0055, Reactor Vessel Instrumentation		
Learning Objective/	RVI-10453, Explain or describe how this system is interrelated with other plant systems.		

Question Source (New, Modified, Bank)		New	
If Bank or Modified:		N/A	
VISION System/Question ID			
Question Source			
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis
			X 2:RI
NUREG 1021 Appendix B: Recognizing Interaction between systems (plural), including consequences and implications			
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	216000	PRA:	NO
Safety Function:	7	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

39

ID: 10-1 NRO39

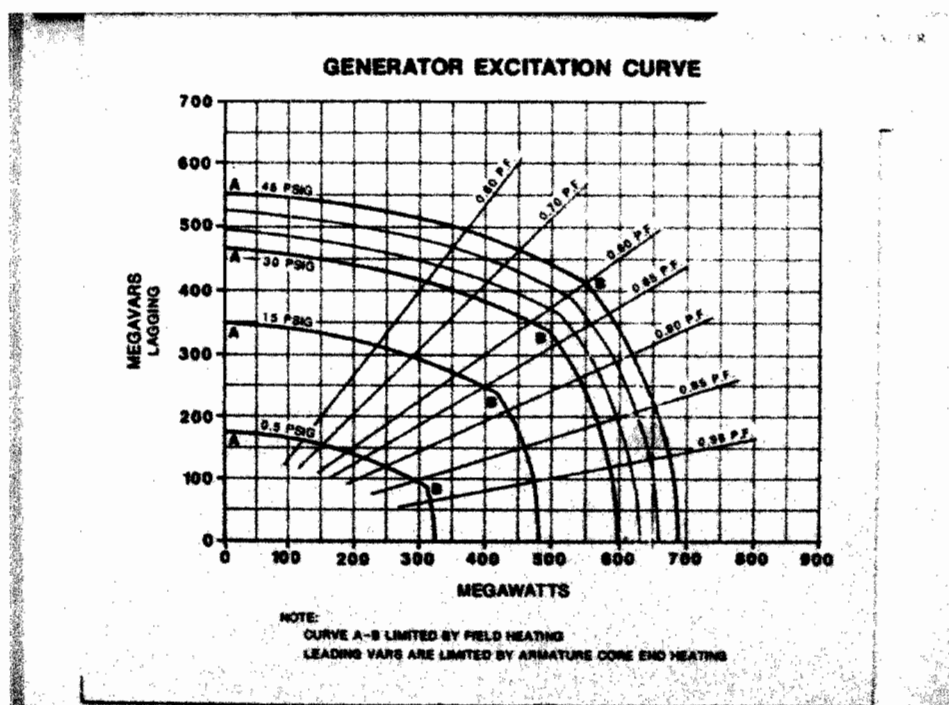
Points: 1.00

The plant is at rated power with the following conditions:

- Main Generator volts: 24KV
- Main Generator MW: 650 MW
- Main Generator VARS: 100 MVARs
- Hydrogen Pressure: 45 psig

A grid disturbance results in steadily **LOWERING** grid voltage. The Main Generator voltage regulator responds as designed by attempting to raise Main Generator terminal voltage.

Panel 8F/9F Generator Capability Curve is provided below.



With **NO** operator action, this transient could result in _____.

- A. overheating the Main Generator rotor windings
- B. overheating the Main Generator stator windings
- C. exceeding the Generator Under Excitation Limit
- D. Generator Lockout due to reverse power relay trip

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Answer: B

Answer Explanation

QID: 10-1 NRO39

Question #	39	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
700000 Generator Voltage and Electric Grid Disturbances AK1.01 - Knowledge of the operational implications of the following concepts as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES and the following: Over-excitation				3.3	3.4
Level	RO	Tier	1	Group	1
General References	336.1				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>B is Correct. The given conditions (lowering grid voltage) will cause the generator automatic voltage regulator to attempt to raise grid voltage, causing the generator to pick up additional VARS (i.e., move up on the Generator Capability Curve). Without operator action, this would result in exceeding the Generator Capability Curve (B-C) for 45 psig hydrogen pressure. Per procedure 336.1 Attachment 336.1-1, curve B-C is limited by armature (stator) heating.</p> <p>A is Incorrect but plausible since this would be true if curve A-B was the limiting factor. Also plausible if the applicant was confused between field, armature, rotor and stator.</p> <p>C is Incorrect but plausible since this would be true if grid voltage was rising, resulting in lowering VARS on the main generator (i.e., move down on the Generator Capability Curve).</p> <p>D is Incorrect. A reverse power trip occurs when real load (MW) is reduced to the point where the grid supplies the generator. The given conditions would not result in lowering MW, especially to the point of reverse power. Plausible if the applicant was confused on real vs. reactive load sharing between generators.</p>
References to be provided during exam:	None
Lesson Plan	2621.828.0.0025, Main Generator
Learning Objective/	GEN-10445, Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified: VISION System/Question ID Question Source		N/A Peach Bottom 2011 RO NRC Exam		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPK
	NUREG 1021 Appendix B: <u>Solve a Problem</u> using <u>Knowledge</u> and its meaning			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

10CRF55 Content	55.41	7	55.43	
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			
Justification for LORT questions with K/A values < 3.0	N/A			
Time to Complete: 1-2 minutes		Point Value: 1		
System ID No.:	700000	PRA:	NO	
Safety Function:	6	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

40

ID: 10-1 NRO40

Points: 1.00

The plant is operating at 75% power when a loss of 125 VDC control power to 4160 VAC Bus 1A occurs.

Which of the following describes the effect this event has on the Reactor Recirculation System?

The (1) Recirc Pump DRIVE MOTOR breakers have lost indication in the Control Room.

Placing their DRIVE MOTOR breaker switch in STOP (2) open the breaker.

	(1)	(2)
A.	A, B, & E	will
B.	A, C, & E	will
C.	A, B, & E	will NOT
D.	A, C, & E	will NOT

Answer: D

Answer Explanation

QID: 10-1 NRO40

Question #

40

Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
295004 Partial or Total Loss of DC Pwr / 6 AK1.05 - Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER : Loss of breaker protection				3.3	3.4
Level	RO	Tier	1	Group	1
General References	EB D-3033	BR 3001A			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>D is Correct. The question stem provides a condition where 125 VDC (from DC-C) Control Power is lost to 4160 VAC Bus 1A. Reactor Recirc Pump A, C, & E are powered from 4160 VAC Bus 1A and a loss of breaker control power to these pumps will result in a loss of breaker indication and remote operation of the breaker will become unavailable.</p> <p>A is Incorrect. This distractor is plausible since there is other logic (such as Recirc Pump ATWS logic) that affects the A, B, & E pumps together. The applicant may confuse pump power supplies with the ATWS logic and is plausible if the applicant does not recall that a loss of breaker control power disables remote operation of the breaker.</p> <p>B is Incorrect. This distractor is plausible if the applicant does not recall that a loss of breaker control power disables remote operation of the breaker.</p> <p>C is Incorrect. This distractor is plausible since there is other logic (such as Recirc Pump ATWS logic) that affects the A, B, & E pumps together. The applicant may confuse pump power supplies with the ATWS logic.</p>
References to be provided during exam:	None
Lesson Plan	2621.828.0.0012, DC Distribution
Learning Objective/	DCD-1121, State potential consequences on plant operation, plant equipment, and environment due to failure of DC Electrical systems.

Question Source (New, Modified, Bank)		Modified	
If Bank or Modified: VISION System/Question ID Question Source		507192 440	
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis X 2:RI
	NUREG 1021 Appendix B: Recognizing Interaction between systems (plural), including consequences and implications		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

10CRF55 Content	55.41	7	55.43	
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			
Justification for LORT questions with K/A values < 3.0	N/A			
Time to Complete: 1-2 minutes		Point Value: 1		
System ID No.:	295004	PRA:	NO	
Safety Function:	6	<input checked="checked" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

41

ID: 10-1 NRO41

Points: 1.00

Given the following conditions:

- Reactor power is 60% and steady
- Main Generator output indicates 330 MWe and steady

An event then occurs resulting in the sequential opening of **ALL** Turbine Bypass Valves over a 3 minute period. Plant conditions now include the following:

- Reactor power is 60% and steady
- Main Generator output indicates 110 MWe and steady

Based on current plant conditions, which one of the following states the plant impact if the Main Turbine were to trip?

The reactor would scram from....

- A. MSIV position.
- B. turbine acceleration relay.
- C. turbine stop valve position.
- D. reactor pressure or neutron monitoring.

Answer: D

Answer Explanation

QID: 10-1 NRO41

Question #	41	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
295005 Main Turbine Generator Trip / 3 AK1.01 - Knowledge of the operational implications of the following concepts as they apply to MAIN TURBINE GENERATOR TRIP: Pressure effects on reactor power				4.0	4.1
Level	RO	Tier	1	Group	1

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

General References	UFSAR 7.7.1.5	BR 2002 Sh. 4 ABN-10	LER 95-005
Explanation	<p>D is Correct. The turbine trip scram is bypassed (ie., no reactor scram if the turbine trips) when reactor power is less than 30%, but the mechanism to sense this amount of power is the HP turbine 3rd stage steam extraction pressure. When everything is normal, this pressure will be directly proportional to reactor power. In the case above, when the turbine bypass valves (TBVs) are open, the main turbine only sees about 20% reactor power, with the other 40% going through the TBVs. Now, it would seem as though the turbine trip-reactor scram is bypassed since the turbine only senses 20% power. Therefore, when the turbine does trip with reactor power at 60% and TBV passing only 40% steam flow, reactor will not scram from TSV closure and reactor pressure will rise. Void suppression will act to raise reactor power and the reactor will scram on either high pressure or nuclear instrumentation.</p> <p>A, B, & C are Incorrect but plausible if the applicant does not recall the turbine anticipatory scram logic. The action to not exceed 40% power until all TBVs are closed and to scram if the Turbine Trips at > 30% power are commitments in LER 95-005. All choices also provide their own scram signals, but not under the scenario for this question.</p>		
References to be provided during exam:	None		
Lesson Plan	2621.828.0.0038, Reactor Protection System		
Learning Objective/	RPS-1157, Describe all RPS scram logic trip signals, including the following: 1. Purpose / Design Basis; 2. Setpoints; 3. Conditions that allow bypassing scram signals; 4. How bypassing scram signals is accomplished.		

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified:			
VISION System/Question ID		608552	
Question Source		ILT 07-1 Comp 3	
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis
			X 3:PEO

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

	NUREG 1021 Appendix B: <u>P</u>redict an <u>E</u>vent or <u>O</u>utcome		
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		
Justification for LORT questions with K/A values < 3.0	N/A		
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	295005	PRA:	NO
Safety Function:	3	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

42

ID: 10-1 NRO42

Points: 1.00

IAW procedure 205.0, Reactor Refueling, which of the following choices would be the **MAXIMUM** fuel pool temperature where fuel transfers into the fuel pool would still be allowed?

- A. 90°F
- B. 100°F
- C. 115°F
- D. 125°F

Answer: C

Answer Explanation

QID: 10-1 NRO42		
Question #	42	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
295023 Refueling Acc Cooling Mode / 8 AK2.02 - Knowledge of the interrelations between REFUELING ACCIDENTS and the following: Fuel pool cooling and cleanup system				2.9	3.2
Level	RO	Tier	1	Group	1
General References	205.0				
Explanation	<p>D is Correct. IAW 205.0, Reactor Refueling, fuel transfers into the fuel pool are not permitted if fuel pool temperature exceeds 115°F. This requirement applies in case there is an event which results in a loss of fuel pool cooling during refuel operations.</p> <p>All distractors are Incorrect but plausible if the applicant does not recall the correct temperature value.</p>				
References to be provided during exam:	None				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Lesson Plan	2621.812.0.0003, Refueling
Learning Objective/	RFL-7442, Describe, in general, refueling and fuel handling procedures to include precautions and limitations per Procedure 205 series.

Question Source (New, Modified, Bank)		New	
If Bank or Modified: VISION System/Question ID Question Source		N/A	
Cognitive Level	Memory or Fundamental Knowledge	X 1:P	Comprehension or Analysis
	NUREG 1021 Appendix B: Procedure steps and cautions		
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	295023	PRA:	NO
Safety Function:	8	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

43

ID: 10-1 NRO43

Points: 1.00

The plant was at rated power when an event occurred resulting in an airborne radiological release outside of the plant structures. Plant conditions include the following:

- All control rods indicate full-in
- A radiological release is in-progress

Which of the following states how and why the control room HVAC system should be aligned?

- A. System A must be run in the PART RECIRC Mode to maintain a positive pressure in the Control Room.
- B. System B must be run in the FULL RECIRC Mode to minimize the use of outside air into the Control Room.
- C. System A must be run in the PURGE Mode, to remove contaminated air from the Control Room, utilizing the fan only.
- D. System B must be run in the PURGE Mode, to remove contaminated air from the Control Room, utilizing the fan only.

Answer: A

Answer Explanation		
QID: 10-1 NRO43		
Question #	43	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
295038 High Off-site Release Rate / 9 EK2.03 - Knowledge of the interrelations between HIGH OFF-SITE RELEASE RATE and the following: Plant ventilation systems				3.6	3.8
Level	RO	Tier	1	Group	1
General References	331.1				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	A is Correct. There are no automatic actions of the control room ventilation system from any high radiation signal.		
	Procedure 331.1, Control Room and Old Cable Spreading Room Heating, Ventilation and Air Conditioning System, describes the partial recirculation mode: this mode of operation is provided to minimize contamination infiltration into the control room by maintaining a positive pressure in the control room using partial outside air.		
	Section 8.1.1 of 331.1, provides guidance for a radiological release with offsite power available. With offsite power available, System B or System A should be run in PART RECIRC mode. Only when there is a loss of offsite power, shall the System be run with the fan only (to limit EDG loading).		
	B is Incorrect but plausible. Running System A in the FULL RECIRC Mode is incorrect. Full Recirc mode is used to minimize the intrusion of toxic gases into the control room.		
	C is Incorrect but plausible. Running System A in the PURGE mode is incorrect. Purge mode is used to remove smoke, fumes, or other undesirable odors from the control room. Also, running the systems with fans only is required only when combined with a loss of off-site power to reduce EDG loading.		
	D is Incorrect but plausible. Running System B in the PURGE mode is incorrect. Purge mode is used to remove smoke, fumes, or other undesirable odors from the control room.		
References to be provided during exam:		None	
Lesson Plan	2621.828.0.0054, Turbine Building & MISC HVAC		
Learning Objective/	SDC-2324, Explain the basis, with use of procedure, the four different modes of control room ventilation damper alignment and the effects of the damper alignment modes on control room habitability.		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified:			
VISION System/Question ID		510832	
Question Source		ILT 05-1 NRC RO EXAM	
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis
	X 3:SPK		
NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	295038	PRA:	NO
Safety Function:	9	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

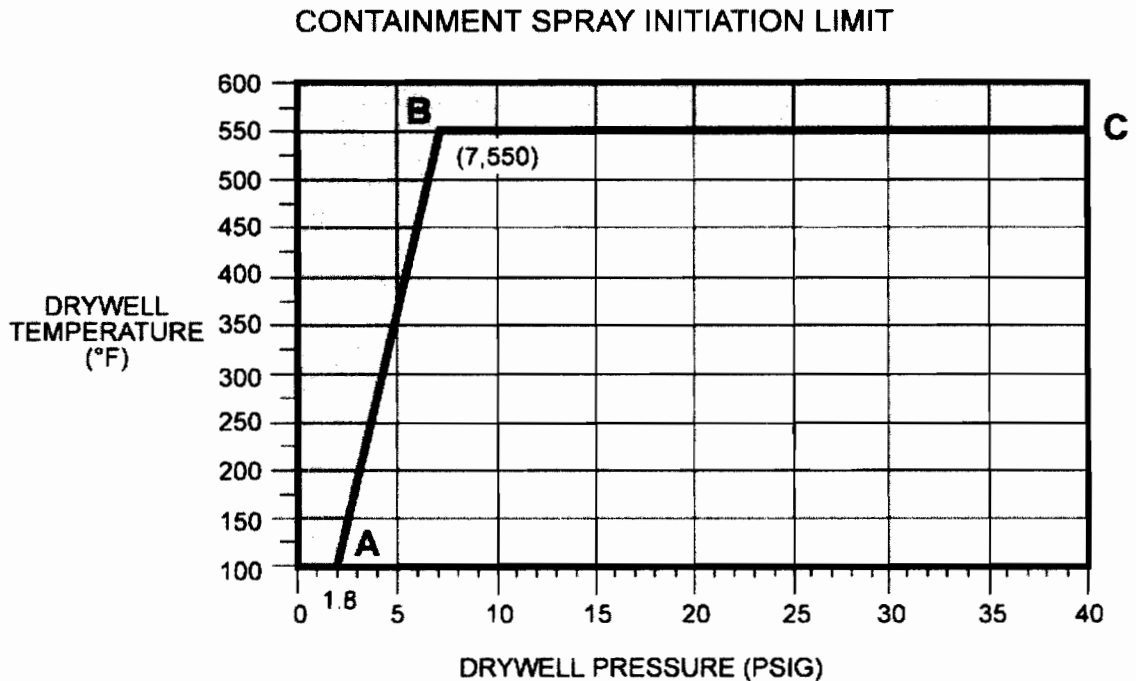
ILT 10-1 NRC RO Exam

44

ID: 10-1 NRO44

Points: 1.00

Under which of the following conditions **CAN** Containment Sprays be initiated in the DW SPRAY mode during high drywell temperature conditions?



	Drywell Pressure (psig)	Drywell Temperature (°F)
A.	2	200
B.	3	250
C.	5	300
D.	6	470

Answer: C

Answer Explanation

QID: 10-1 NRO44

Question #

44

Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

K&A					Importance Rating	
					RO	SRO
295028 High Drywell Temperature / 5 EK2.01 - Knowledge of the interrelations between HIGH DRYWELL TEMPERATURE and the following: Drywell spray: Mark-I&II					3.7	4.1
Level	RO	Tier	1	Group	1	
General References	PCC EOP		EOP User's Guide			
Explanation	C is Correct. Starting containment spray due to high DW temperature can be performed only when DW temp/DW pressure point is below the containment spray initiation limit (CSIL) curve. Only answer C is below the curve and others are above. All distractors are Incorrect but plausible if the applicant does not correctly interpret the CSIL graph or understand the basis for the CSIL curve.					
References to be provided during exam:		None				
Lesson Plan	2621.845.0.0056, Primary Containment Control					
Learning Objective/	PCC-3000, Using the EOP User's Guide, evaluate the technical bases for each step in the procedure and apply this evaluation to determine correct courses of action under emergency conditions.					

Question Source (New, Modified, Bank)				Bank	
If Bank or Modified: VISION System/Question ID Question Source			609031 ILT 07-1 AUDIT RO EXAM		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPR	
	NUREG 1021 Appendix B: <u>S</u> olve a <u>P</u> roblem using <u>R</u> eferences				
10CRF55 Content	55.41	10	55.43		
	Administrative, normal, abnormal, and emergency operating procedures for the facility.				
Justification for LORT questions with K/A values < 3.0		N/A			
Time to Complete: 1-2 minutes			Point Value: 1		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

System ID No.:	295028	PRA:	NO
Safety Function:	5	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

45

ID: 10-1 NRO45

Points: 1.00

The plant was at rated power when an event resulted in the following conditions:

- RPV water level indicates 0" and lowering slowly
- **NO** RPV injection systems are available

The Steam Cooling EOP has been entered. Which of the following is correct?

IAW the EOP Users Guide, an RPV water level of ____ **(1)** ____, would still provide enough steam flow through the core to prevent exceeding ____ **(2)** ____ clad temperature.

	(1)	(2)
A.	-17"	1500 °F
B.	-23"	1500 °F
C.	-33"	1800 °F
D.	-38"	1800 °F

Answer: C

Answer Explanation

QID: 10-1 NRO45

Question #	45	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
295031 Reactor Low Water Level EK3.04 - Knowledge of the reasons for the following responses as they apply to REACTOR LOW WATER LEVEL: Steam cooling				4.0	4.3
Level	RO	Tier	1	Group	1
General References	EOP User's Guide				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>C is Correct. The Steam Cooling EOP has been entered. Core cooling is maintained from the steam passing the uncovered portions of the fuel by one of two mechanisms: injection into the RPV is available or injection is not available. If injection is available, as long as RPV water level is $\geq -20"$, then cladding temperature will remain ≤ 1500 °F. If no injection is available, as long as RPV water level is $\geq -35"$, then cladding temperature will remain ≤ 1800 °F. With no RPV injection, an RPV water level of $-33"$ ensures clad temperature ≤ 1800 °F.</p> <p>A & B are Incorrect but plausible due to level above $-35"$, but the temperature limit is incorrect.</p> <p>D is Incorrect but plausible due to level being less than $-35"$.</p>	
References to be provided during exam:	None	
Lesson Plan	2621.845.0.0055, Steam Cooling	
Learning Objective/	ESC-3004, Describe in detail each step or conditional statement including the technical basis and how to verify or perform each step as required.	

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified: VISION System/Question ID		718322	
Question Source		ILT 09-1 NRC RO EXAM	
Cognitive Level	Memory or Fundamental Knowledge	X 1:B	Comprehension or Analysis
	NUREG 1021 Appendix B: Bases or purpose		
10CRF55 Content	55.41	10	55.43
	Administrative, normal, abnormal, and emergency operating procedures for the facility.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	295031	PRA:	NO
Safety Function:	2	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

46

ID: 10-1 NRO46

Points: 1.00

The plant was at rated power when an event resulted in a scram. The plant is currently cooling down with the Shutdown Cooling System (SDC). Current conditions are as follows:

- RPV water level is 181 in TAF and steady
- Recirculation Pump suction temperature is 265°F
- SDC Pump C is operating, with the other SDC Pumps unavailable
- Main Condenser vacuum indicates 8 in Hg

An electrical fault in the breaker cubicle for SDC C discharge valve V-17-57 causes the valve to close. RPV temperature starts to rise.

Under these conditions, which of the following methods (and reason for using that method) can be used to cooldown the RPV?

- A. Isolation Condensers since using this method will preserve RPV water inventory.
- B. The Turbine Bypass Valves since this is the preferred method for rejecting decay heat from the reactor.
- C. Feed with CRD and Bleed with Reactor Water Cleanup System letdown since the hotwell can still be considered to be available.
- D. Alternate shutdown cooling with Safety Valves and Core Spray since this is the method recommended by ABN-3, Loss of Shutdown Cooling.

Answer: C

Answer Explanation

QID: 10-1 NRO46

Question #	46	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
295021 Loss of Shutdown Cooling / 4 AK3.02 - Knowledge of the reasons for the following responses as they apply to LOSS OF SHUTDOWN COOLING : Feeding and bleeding reactor vessel				3.3	3.4
Level	RO	Tier	1	Group	1

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

General References	ABN-3	303	
Explanation	<p>C is Correct. The question stem describes a loss of main condenser vacuum followed by a total loss of Shutdown Cooling (SDC). ABN-3, Loss of SDC, describes several methods of alternate cooling. Feed (with CRD/Cond Pump) and Bleed (with RWCU letdown) are the only choices available due to the conditions in the question stem. The reason the RWCU letdown can be used is even with no condenser vacuum, the condenser is still considered intact and available. RWCU to the hotwell might reach 120-130F, however this is not steam conditions.</p> <p>A is Incorrect. This distractor is plausible if the applicant does not recall that Isolation Condensers cannot be used when RPV water level is > 160 in TAF.</p> <p>B is Incorrect. This distractor is plausible if the applicant does not recall that the Main Condenser is not capable of accepting steam with no vacuum since the Bypass Valves will be closed.</p> <p>D is Incorrect. This distractor is plausible since this method is available if EMRVs were used instead of SRVs, which the distractor states. SRVs do not have the capability to be manually operated.</p>		
References to be provided during exam:	None		
Lesson Plan	2621.828.0.0045, Shutdown Cooling System		
Learning Objective/	SDC-10453, Explain or describe how this system is interrelated with other plant systems.		

Question Source (New, Modified, Bank)			Modified	
If Bank or Modified: VISION System/Question ID		510757		
Question Source		ILT 05-1 RO AUDIT EXAM		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPK
	NUREG 1021 Appendix B: <u>Solve a Problem</u> using <u>Knowledge</u> and its meaning			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

10CRF55 Content	55.41	5	55.43	
	Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes		Point Value: 1		
System ID No.:	295021	PRA:	NO	
Safety Function:	4	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

47

ID: 10-1 NRO47

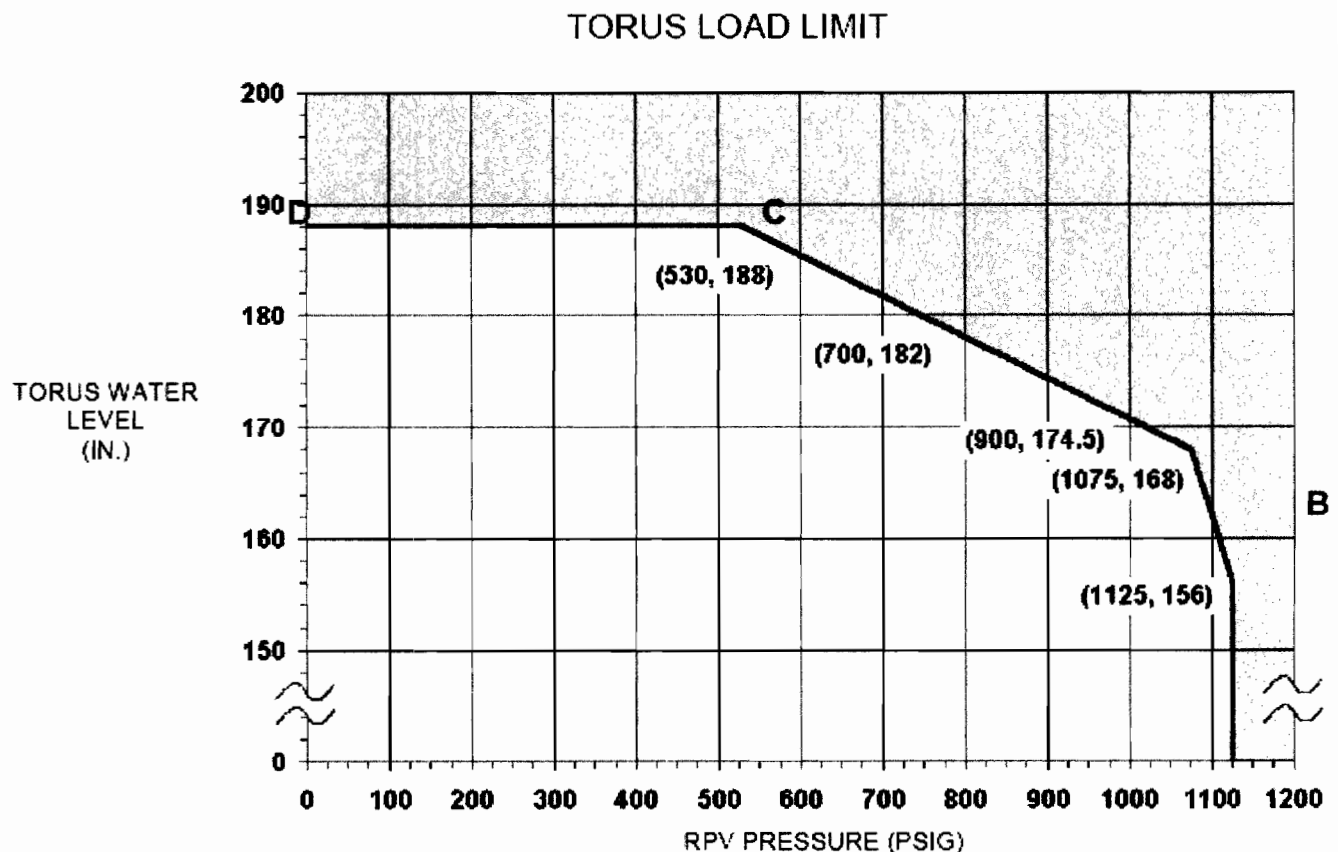
Points: 1.00

The plant was at rated power when an event resulted in a large break LOCA. Plant conditions include the following:

- Reactor Power indicates 1% on all APRMs
- Reactor Pressure indicates 600 psig and lowering
- Torus temperature indicates 95°F and rising
- Torus water level indicates 150 inches and rising
- Drywell Pressure indicates 30 psig and rising
- Torus Pressure indicates 28 psig and rising

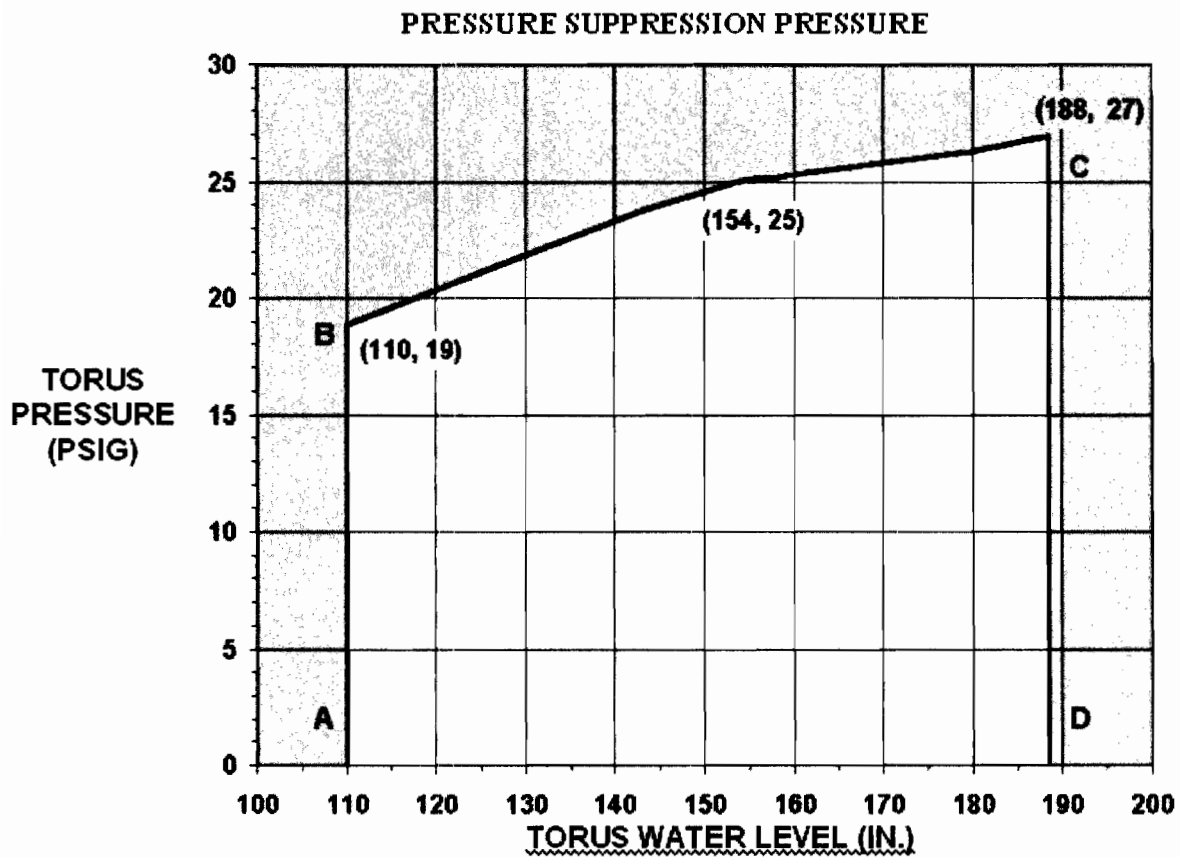
Based on the above plant parameters, the US enters and directs Emergency Depressurization (ED) due to exceeding an EOP Figure limit.

Refer to the EOP Figures below.



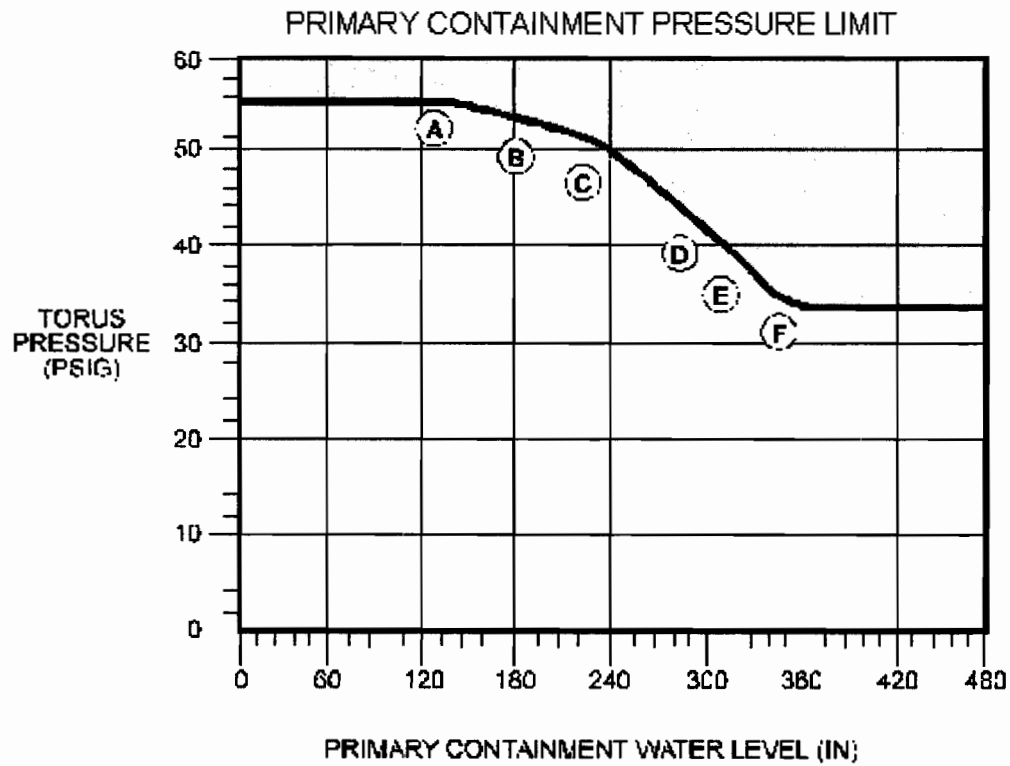
EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam



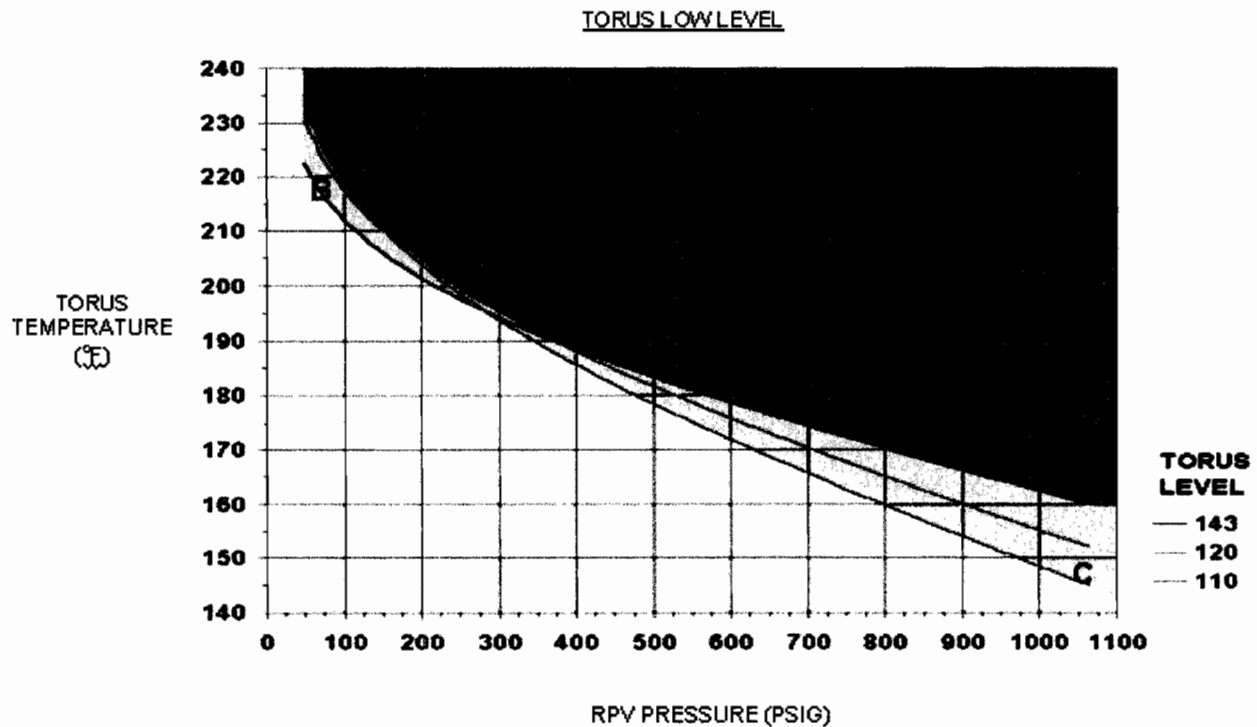
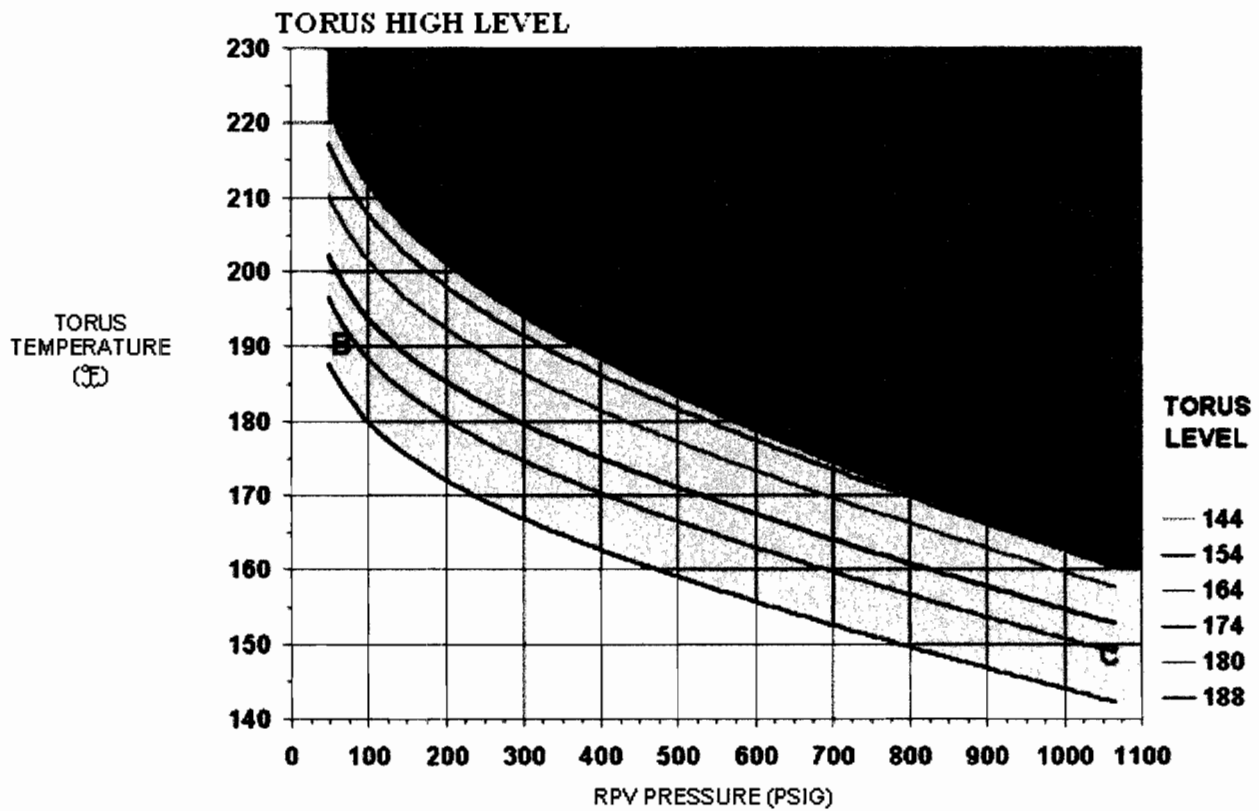
EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam



EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam



EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

What EOP Figure limit has been exceed?

- A. Torus Load Limit (TLL)
- B. Pressure Supression Pressure (PSP)
- C. Heat Capacity Temperature Limit (HCTL)
- D. Primary Containment Pressure Limit (PCPL)

Answer: B

Answer Explanation

QID: 10-1 NRO47		
Question #	47	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information						
K&A					Importance Rating	
					RO	SRO
295024 High Drywell Pressure / 5 EK3.04 - Knowledge of the reasons for the following responses as they apply to HIGH DRYWELL PRESSURE : Emergency depressurization					3.7	4.1
Level	RO	Tier	1	Group	1	
General References		PCC EOP		EOP User's Guide		
Explanation		B is Correct. The question stem provides a condition plant parameters where an EOP Figure Limit has been exceeded. The applicant must analyze the conditions and determine that the reason an ED was directed was the PSP had been exceeded (Torus Pressure at 28 psig and Torus Level at 150 in exceeds the limit). Drywell pressure and Torus pressure are relatively equal in a Mark-I containment during LOCA conditions.				
		All distractors are plausible if the applican does not interpret the plant parameters correctly. All distractors are EOP Figures that if they were exceeded would require an ED.				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

References to be provided during exam:	None	
Lesson Plan	2621.845.0.0056, Primary Containment Control	
Learning Objective/	PCC-3000, Using the EOP User's Guide, evaluate the technical bases for each step in the procedure and apply this evaluation to determine correct courses of action under emergency conditions.	

Question Source (New, Modified, Bank)			New	
If Bank or Modified: VISION System/Question ID Question Source		N/A		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPK
	NUREG 1021 Appendix B: <u>Solve a Problem</u> using Knowledge and its meaning			
10CRF55 Content	55.41	10	55.43	
	Administrative, normal, abnormal, and emergency operating procedures for the facility.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes		Point Value: 1		
System ID No.:	295024	PRA:	NO	
Safety Function:	5	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

48

ID: 10-1 NRO48

Points: 1.00

Given the following conditions:

- Operation of the plant is being controlled from the Remote Shutdown Panel
- RPV pressure is 1050 PSIG and rising
- RPV water level is 100 inches TAF and lowering
- Isolation Condenser Transfer Switches for Train "A" and "B" are in ALTERNATE
- **ALL** actions required to be performed prior to exiting the Control Room have been completed

Concerning the Isolation Condensers, which of the following will occur if an initiation signal is received?

- A. ONLY the "A" Isolation Condenser will automatically initiate
- B. ONLY the "B" Isolation Condenser will automatically initiate
- C. Initiation signals are bypassed; the operator must open the DC Condensate Return Valve to place "A" Isolation Condenser in service
- D. Initiation signals are bypassed; the operator must open the DC Condensate Return Valve to place "B" Isolation Condenser in service

Answer: D

Answer Explanation

QID: 10-1 NRO48		
Question #	48	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
295016 Control Room Abandonment / 7 AA1.09 - Ability to operate and/or monitor the following as they apply to CONTROL ROOM ABANDONMENT : Isolation/emergency condenser(s): Plant-Specific				4.0	4.0
Level	RO	Tier	1	Group	1
General References	ABN-30	346			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>D is Correct. Only the 'B' Isolation Condenser (IC) can be operated from the Remote Shutdown Panel (RSP). When 'A' and 'B' IC Train switches are in ALTERNATE, all automatic initiations are bypassed. The 'B' IC Condensate Return Valve, V-14-35, must be manually opened on the RSP.</p> <p>All distractors are Incorrect but plausible if the applicant does not recall the IC initiation logic when their Train controls are in Alternate.</p>	
References to be provided during exam:	None	
Lesson Plan	2621.828.0.0023, Isolation Condensers	
Learning Objective/	ICS-10456, Describe the Isolation Condenser System design feature which provides for the following: a. System control outside of the control room (including automatic actions bypassed) b. Removal of non-condensable gases.	

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified: VISION System/Question ID		507169		
Question Source		417		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:PEO
	NUREG 1021 Appendix B: <u>P</u> redict an <u>E</u> vent or <u>O</u> utcome			
10CRF55 Content	55.41	7	55.43	
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	295016	PRA:	NO	
Safety Function:	7	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

49

ID: 10-1 NRO49

Points: 1.00

The plant was at rated power. An event then occurs and plant conditions include the following:

At Time = 0 seconds:

- Annunciator 4160V STATION POWER - BUS 1C VOLTS LO comes into alarm
- Panel 8F/9F 4160V BUS 1C voltage indicates 3750 AC VOLTS

Based on these conditions, at what time will the following Panel 8F/9F indications be observed?

- At Time = (1) seconds, EDG 1 white UNIT START light will be lit.
- At Time = (2) seconds, MAIN BREAKER IC green OPEN light will be **LIT**, and red CLOSED light will be **OFF**.

	(1)	(2)
A.	0	3
B.	3	3
C.	3	10
D.	10	10

Answer: D

Answer Explanation

QID: 10-1 NRO49

Question #

49

Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A	Importance Rating	
	RO	SRO

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

295003 Partial or Complete Loss of AC / 6 AA1.03 - Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : Systems necessary to assure safe plant shutdown					4.4	4.4
Level	RO	Tier	1	Group	1	
General References		RAP-T3a		UFSAR 7.4		
Explanation		<p>D is Correct. The question stem provides a condition where 4160 VAC Bus 1C is experiencing a low Voltage condition (<3830 volts). IAW RAP T-3-a, after 10 seconds, 4160 V Breaker 1C will trip and EDG-1 will Fast Start. IAW the UFSAR, the EDGs are part of Systems Required for Safe Shutdown. This question examines the applicants ability to monitor this system upon a loss of 4160 VAC to the 1C emergency bus.</p> <p>All distractors are Incorrect. On a complete loss of voltage, or voltage < 2704 V for 3 seconds, 4160 V Breaker 1C will trip and EDG-1 will Fast Start at the 3 second mark. These distractors are plausible if the applicant does not recall all automatic breaker trip logic or EDG fast start logic.</p>				
References to be provided during exam:			None			
Lesson Plan		2621.828.0.0016, AC Electrical Distribution				
Learning Objective/		EDS-10449, State the function and interpretation of system alarms, alone and in combination, as applicable in accordance with the system RAPS.				

Question Source (New, Modified, Bank)			Modified		
If Bank or Modified: VISION System/Question ID Question Source			510791 ILT 05-1 RO AUDIT EXAM		
Cognitive Level	Memory or Fundamental Knowledge	X 1:1	Comprehension or Analysis		
	NUREG 1021 Appendix B: Interlocks, setpoints, or system (singular) response				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

10CRF55 Content	55.41	7	55.43	
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			
Justification for LORT questions with K/A values < 3.0	N/A			
Time to Complete: 1-2 minutes		Point Value: 1		
System ID No.:	295003	PRA:	NO	
Safety Function:	6	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

50

ID: 10-1 NRO50

Points: 1.00

The reactor is at rated power. An event then occurred and plant conditions include the following:

- RPV Pressure indicated 1070 psig for several seconds, then started lowering

How did the plant respond?

- A. Isolation Condenser 'A' **ONLY** is in service and its vent valves are **CLOSED**
- B. Isolation Condenser 'B' **ONLY** is in service and its vent valves are **OPEN**
- C. **NEITHER** Isolation Condenser is in service and their vent valves are **OPEN**
- D. **BOTH** Isolation Condensers are in service and their vent valves are **CLOSED**

Answer: D

Answer Explanation

QID: 10-1 NRO50

Question # 50 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
295025 High Reactor Pressure / 3 EA1.06 - Ability to operate and/or monitor the following as they apply to HIGH REACTOR PRESSURE: Isolation condenser: Plant-Specific				4.5	4.5
Level	RO	Tier	2	Group	1
General References	RAP-C1a	BR 3029		IC Lesson Plan	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>D is Correct. The question stem provides a condition where RPV pressure rose above the EMRV lift setpoint. When RPV pressure is > 1051 psig for 1.5 seconds, both ICs will initiate and their vent valves will close. The question stem indicates that the EMRV rose for several seconds.</p> <p>A is Incorrect. The first EMRV to lift would be the 'A' EMRV due to its setpoint and location in the main steam header. This distractor is plausible if the applicant believes that only 'A' EMRV lifted, only 'A' IC will initiate.</p> <p>B is Incorrect. This distractor is plausible if the applicant does not recall that both ICs initiate when a high RPV pressure condition exists.</p> <p>C is Incorrect. This distractor is plausible if the applicant does not recall that ICs should have initiated on high RPV pressure.</p>
References to be provided during exam:	None
Lesson Plan	2621.828.0.0023, Isolation Condensers
Learning Objective/	ICS-2030, Describe the Isolation Condenser design feature(s) and/or interlocks (including signals and setpoints) which provide for the following: a) Automatic system initiation; b) Automatic system isolation

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified: VISION System/Question ID Question Source		510768 ILT 05-1 RO AUDIT EXAM	
Cognitive Level	Memory or Fundamental Knowledge	X 1:1	Comprehension or Analysis
	NUREG 1021 Appendix B: Interlocks, setpoints, or system (singular) response		
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Justification for LORT questions with K/A values < 3.0	N/A		
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	295025	PRA:	NO
Safety Function:	3	<input checked="checked" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

51

ID: 10-1 NRO51

Points: 1.00

The plant was at rated power when an event occurred requiring entry into the Primary Containment Control EOP.

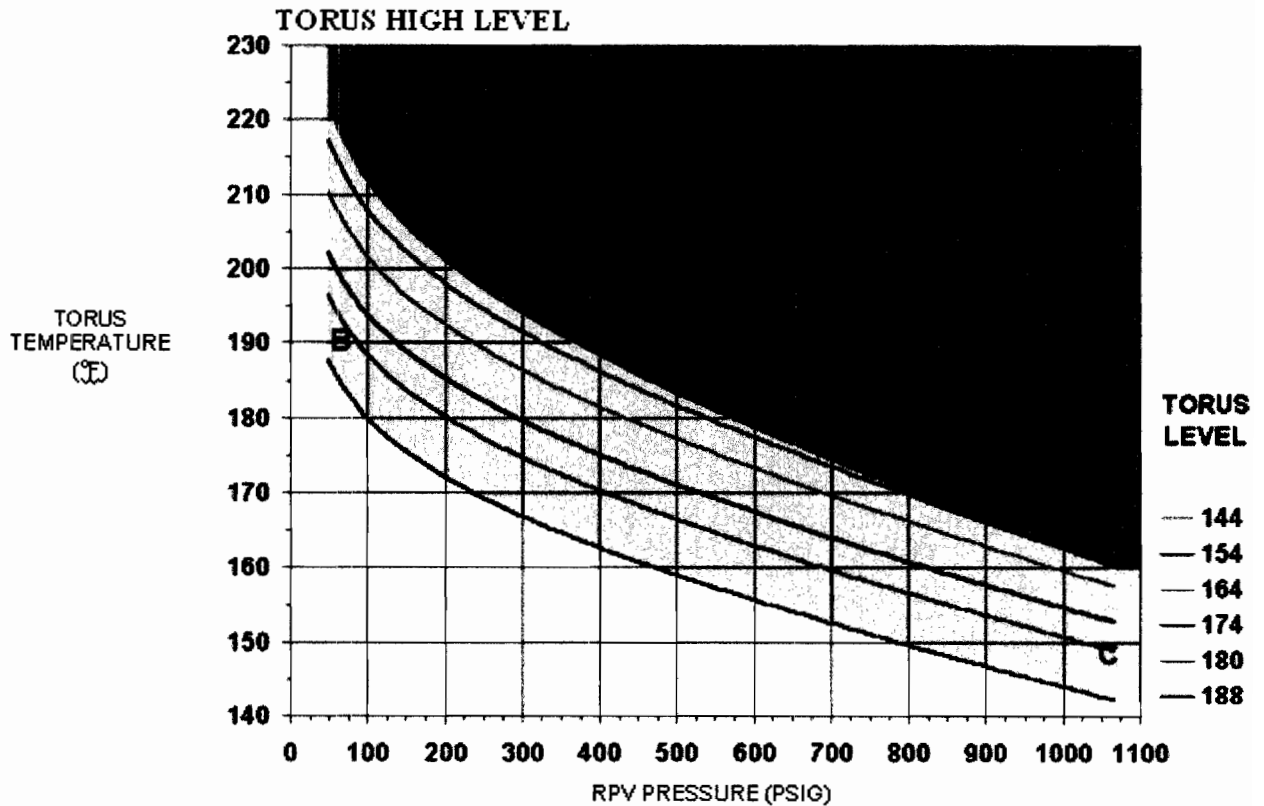
Panel 1F/2F Torus indications are as follows (assume these parameters remain constant):

<div>TORUS TEMP BULK DIV I</div> <div>T1-004-43A</div>	<div>F</div>	<div>240 °F</div> <div>40 °F</div>
<div>TORUS LEVEL WIDE RANGE DIV I</div> <div>LT-37</div>	<div>INCHES</div>	<div>360 "</div> <div>10 "</div>
<div>TORUS TEMP BULK DIV II</div> <div>T1-004-43B</div>	<div>F</div>	<div>240 °F</div> <div>40 °F</div>
<div>TORUS LEVEL WIDE RANGE DIV II</div> <div>LT-38</div>	<div>INCHES</div>	<div>360 "</div> <div>10 "</div>

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Which of the following choices below indicates the **MAXIMUM** RPV Pressure allowed before the Heat Capacity Temperature Limit (HCTL) has been exceeded?



- A. 450 psig
- B. 650 psig
- C. 750 psig
- D. 800 psig

Answer: B

Answer Explanation

QID: 10-1 NRO51

Question # 51 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A

Importance Rating

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

					RO	SRO
295026 Suppression Pool High Water Temp. / 5 EA2.03 - Ability to determine and/or interpret the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: Reactor pressure					3.9	4.0
Level	RO	Tier	1	Group	1	
General References		PCC EOP		EOP User's Guide		
Explanation		<p>B is Correct. At a Torus level of 177", the green 180" Torus level line applies. RPV Pressure must be maintained below the green line. The maximum RPV pressure listed where Torus temperature and level intersect without exceeding the HCTL is 650 psig.</p> <p>A is Incorrect. This distractor is plausible if the applicant swaps Torus Temperature and Torus Level indications when interpreting the EOP Figure limit. In this instance the orange 164" level line would apply and from the choices listed, only 450 psig would not violate the HCTL.</p> <p>C is Incorrect. This distractor is plausible if the applicant tries to extrapolate the Torus level of 177" in between the green and orange level lines. In this case, 175 psig is the maximum pressure listed which would not violate the HCTL.</p> <p>D is Incorrect. This distractor is plausible if the applicant chooses the orange 174" level line to maintain pressure below. In this case the applicant will choose 800 psig as the maximum RPV pressure listed which will not violate the HCTL.</p>				
References to be provided during exam:			None			
Lesson Plan		2621.845.0.0056, Primary Containment Control				
Learning Objective/		PCC-10445, Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.				
Question Source (New, Modified, Bank)					New	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

If Bank or Modified: VISION System/Question ID Question Source		N/A		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPK
	NUREG 1021 Appendix B: Solve a Problem using References			
10CRF55 Content	55.41	10	55.43	
	Administrative, normal, abnormal, and emergency operating procedures for the facility.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	295026	PRA:	NO	
Safety Function:	5	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

52

ID: 10-1 NRO52

Points: 1.00

The plant was at rated power when a fire was confirmed in the 'A' 480V Switchgear Room. Several minutes later the following indications were observed in the Control Room:

- EMRV NR-108B and NR-108E indicate spuriously opening and closing
- **ALL** other EMRVs indicate closed and have **NOT** opened

IAW ABN-29, Plant Fires, which of the following actions is required due to the condition stated above?

Enter ABN-1, Reactor Scram, and place...

- A. **ALL** EMRV keylocks in DISABLE.
- B. **ALL** EMRV control switches in OFF.
- C. **ONLY** EMRV NR-108B and NR-108E keylocks in DISABLE.
- D. **ONLY** EMRV NR-108B and NR-108E control switches in OFF.

Answer: C

Answer Explanation

QID: 10-1 NRO52

Question # 52 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
600000 Plant Fire On-site / 8 AA2.16 - Ability to determine and interpret the following as they apply to PLANT FIRE ON SITE: Vital equipment and control systems to be maintained and operated during a fire				3.0	3.5
Level	RO	Tier	1	Group	1
General References	FSP-OB6A	ABN-29			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	A is Correct. The question stem provides a condition where there is a fire in the 'A' 480V Switchgear Room. Fire Support Procedure (FSP)-OB6A directs manually scrambling the reactor and disabling the spuriously opening EMRVs if spurious operation is observed. This is due to the fire causing hot shorts in the EMRV circuitry.		
	FSP-OB6A also states that all EMRV can be un-DISABLED if required by EOPs. EMRVs are Vital Equipment required for ADS and overpressure protection. This is how their operation is managed during a plant fire in the 'A' 480V Switchgear Room testing their knowledge per the K/A.		
	All distractors are Incorrect but plausible if the applicant does not recall the correct action to take in this situation. Too difficult (level 5) without reference.		
References to be provided during exam:		FSP-OB6A	
Lesson Plan	2621.828.0.0019, Fire Protection System		
Learning Objective/	FPS-10450, Describe and interpret procedure sections and steps for plant emergency or off-normal conditions that involve this system including personnel allocation and equipment operation IAW applicable ABN, SDRP, EOP & EOP support procedures and EP Procedures.		

Question Source (New, Modified, Bank)		New	
If Bank or Modified: VISION System/Question ID Question Source		N/A	
Cognitive Level	Memory or Fundamental Knowledge	X 1:P	Comprehension or Analysis
	NUREG 1021 Appendix B: Procedure steps and cautions		
10CRF55 Content	55.41	10	55.43
	Administrative, normal, abnormal, and emergency operating procedures for the facility.		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Justification for LORT questions with K/A values < 3.0	N/A		
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	600000	PRA:	NO
Safety Function:	8	<input checked="checked" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

53

ID: 10-1 NRO53

Points: 1.00

The plant is in hot shutdown and has just commenced cooling down for an outage utilizing the Shutdown Cooling System, when the following Panel 1F/2F annunciator came into alarm:



Which of the following annunciators would be the **NEXT** expected annunciator to come into alarm?

- A. TORUS/DRYWELL - DW TEMP HI
- B. MAIN STEAM - TRUNNION RM TEMP HI
- C. RBCCW - CCW/SD CLG/FUEL POOL TEMP HI
- D. CLEANUP SYSTEM - AUX PUMP CCW TEMP HI

Answer: A

Answer Explanation

QID: 10-1 NRO53

Question #	53	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A					Importance Rating	
					RO	SRO
295018 Partial or Total Loss of CCW / 8 AA2.01 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER : Component temperatures					3.3	3.4
Level	RO	Tier	1	Group	1	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

General References	RAP-C2c	RAP-C8h	
Explanation	<p>A is Correct. The given alarm in the question stem shows that one of the RBCCW to primary containment isolation valves is not full open (RAP-C2c). [RBCCW DW Isolation Valve V-5-147, V-5-166, or V-5-167 not full open]. This would prevent/hinder RBCCW flow to all Primary Containment loads. Answer A is the only alarm listed whose components (loss of RBCCW cooling to the DW air coolers would result in DW temperature high alarm) is cooled by RBCCW and are located within the primary containment (RAP-C8h).</p> <p>B is Incorrect but plausible. This is indicative of a high temperature in the trunion room (also cooled by RBCCW) but it also is outside the primary containment and is unaffected by the loss of cooling to the primary containment.</p> <p>C & D are Incorrect but plausible. These distractors could result from a total loss of RBCCW, but these components are located outside the primary containment and are not effected by the loss of RBCCW to the primary containment components.</p>		
References to be provided during exam:	None		
Lesson Plan	2621.828.0.0035, RBCCW System		
Learning Objective/	RBC-0048, List possible causes, system response, and affected RBCCW system components for an isolation signal.		

Question Source (New, Modified, Bank)		Bank		
If Bank or Modified:				
VISION System/Question ID		510676		
Question Source		ILT 05-1 RO AUDIT EXAM		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 2:RI
	NUREG 1021 Appendix B: Recognizing Interaction between systems (plural), including consequences and implications			
10CRF55 Content	55.41	10	55.43	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

	Administrative, normal, abnormal, and emergency operating procedures for the facility.		
Justification for LORT questions with K/A values < 3.0	N/A		
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	295018	PRA:	NO
Safety Function:	8	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

54

ID: 10-1 NRO54

Points: 1.00

The plant is at 70% power. The Panel 7F Air Compressor lineup is as follows:

COMPRESSOR 1

- LEAD compressor
- Indicates RED light ON and GREEN light OFF
- RED breaker flag is showing

COMPRESSOR 2

- LAG compressor
- Indicates GREEN light ON and RED light OFF
- GREEN breaker flag is showing

COMPRESSOR 3

- STANDBY compressor
- Indicates GREEN light ON and RED light OFF
- GREEN breaker flag is showing

A seismic event results in a leak in the Instrument Air Header and an electrical fault on Unit Substation 1A1. Plant indications now include the following:

- Panel 7F meter INSTR AIR SUPPLY PRESS indicates 60 psig and slowly lowering

Which of the following describes the current Air Compressor indications?
(assume **NO** operator action has been taken)

- A.
 - COMPRESSOR 1 indicates GREEN light ON
 - COMPRESSOR 2 indicates RED light ON
 - COMPRESSOR 3 indicates RED light ON
- B.
 - COMPRESSOR 1 indicates GREEN light ON
 - COMPRESSOR 2 indicates RED light ON
 - COMPRESSOR 3 indicates GREEN light ON
- C.
 - COMPRESSOR 1 indicates RED light ON
 - COMPRESSOR 2 indicates GREEN light ON
 - COMPRESSOR 3 indicates RED light ON
- D.
 - COMPRESSOR 1 indicates RED light ON
 - COMPRESSOR 2 indicates RED light ON
 - COMPRESSOR 3 indicates GREEN light ON

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Answer: A

Answer Explanation

QID: 10-1 NRO54

Question # 54 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
295019 Partial or Total Loss of Inst. Air / 8 2.1.31 - Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup.				4.6	4.3
Level	RO	Tier	1	Group	1
General References	334				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>A is Correct. The question stem provides a condition Air Compressor 1 is in LEAD, Compressor 2 is in LAG, and Compressor 3 is in STANDBY. A seismic event results in a loss of USS-1A1 which is the power supply to Compressor 1. The event also results in an Instrument Air leak. As Instrument Air pressure lowers, the LAG Compressor will start at 95 psig and STANDBY Compressor will start at 85 psig. The applicant just be able to recognize what Compressor indications are expected to be for the current situation in the question stem.</p>		
	<p>B is Incorrect. This distractor is plausible if the applicant does not recall that the STANDBY Compressor #3 will also start. The applicant might believe it must be manually started (and the stem states no operator action has been taken).</p>		
	<p>C is Incorrect. This distractor is plausible if the applicant does not recognize that Compressor 1 lost power from the loss of USS-1A1, not Compressor 2. These would be the expected indications if Compressor 2 had lost power.</p>		
	<p>D is Incorrect. This distractor is plausible if the applicant believes that neither Compressor has lost power and that Compressor 3 must be manually started.</p>		
References to be provided during exam:		None	
Lesson Plan	2621.828.0.0043, Service, Instrument, and Breathing Air		
Learning Objective/	CAS-10440, Given the system logic/electrical drawings, describe the system auto isolation signals, setpoints and expected system response including power loss or failed components.		

Question Source (New, Modified, Bank)		New		
If Bank or Modified: VISION System/Question ID Question Source		N/A		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 2:DR

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

	NUREG 1021 Appendix B: Describing or recognizing Relationships		
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		
Justification for LORT questions with K/A values < 3.0	N/A		
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	295019	PRA:	NO
Safety Function:	8	<input checked="checked" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

55

ID: 10-1 NRO55

Points: 1.00

The plant was at rated power when a turbine trip/reactor scram occurred. Plant conditions include the following:

- Both Isolation Condensers have auto initiated.
- Two (2) EMRV's are OPEN.
- Isolation Condenser B level is 7.7 feet and rising
- Annunciator SHELL TEMP HI is in alarm
- Attempts to isolate the affected isolation condenser have failed
- Torus bulk temperature is 91 degrees F and steady
- 51' Cleanup Pump area radiation monitor C-1 is reading 5 mr/hr (annunciator AREA MON HI is not in alarm)
- NO other annunciators are in alarm

IN ADDITION TO RPV CONTROL –NO ATWS EOP, which EOP(s) has(have) met entry conditions and require implementation?

- A. Primary Containment Control EOP **AND** Radioactivity Release Control EOP
- B. Primary Containment Control EOP **ONLY**
- C. Radioactivity Release Control EOP **ONLY**
- D. Secondary Containment Control EOP **ONLY**

Answer: C

Answer Explanation

QID: 10-1 NRO55

Question #	55	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
295006 SCRAM / 1 2.4.4 - Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.				4.5	4.7
Level	RO	Tier	1	Group	1

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

General References	RR EOP	EOP User's Guide	
Explanation	<p>C is Correct. The question stem provides a conditions of an Isolation Condenser Tube Leak. IAW the Radioactivity Release EOP, an confirmed IC tube leak requires entry into the RR EOP.</p> <p>A & B are Incorrect. These distractors are plausible if the applicant does not recognize Torus Temperature is below that required for entry into the Primary Containment Control EOP.</p> <p>D is Incorrect. This distractor is plausible if the applicant does not recognize that the 51' Cleanup Pump area radiation monitor C-1 is below that which requires entry into Secondary Containment Control.</p>		
References to be provided during exam:	None		
Lesson Plan	2621.845.0.0058, Radioactivity Release Control		
Learning Objective/	RRC-01667, Based upon specific plant parameters and conditions, determine if entry conditions for EOPs have been met and which EOPs are applicable to the conditions provided.		

Question Source (New, Modified, Bank)				Bank	
If Bank or Modified: VISION System/Question ID Question Source			608565 ILT 07-1 Comp # 3		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis		X 3:SPK
	NUREG 1021 Appendix B: <u>S</u> olve a <u>P</u> roblem using <u>K</u> nowledge and its meaning				
10CRF55 Content	55.41	10	55.43		
	Administrative, normal, abnormal, and emergency operating procedures for the facility.				
Justification for LORT questions with K/A values < 3.0		N/A			
Time to Complete: 1-2 minutes			Point Value: 1		
System ID No.:	295006		PRA:	NO	
Safety Function:	1	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

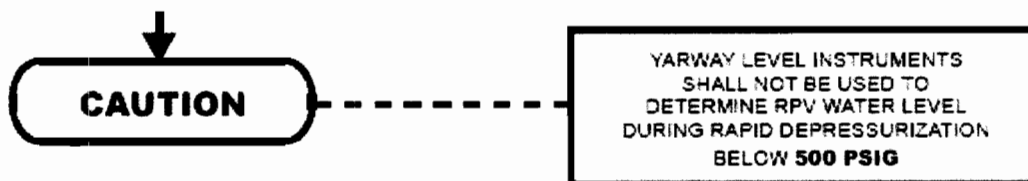
56

ID: 10-1 NRO56

Points: 1.00

The plant was at rated power when a combined RPV Isolation and ATWS occurred. Several EMRVs are cycling open and closed.

In the RPV Control - with ATWS EOP Pressure Leg, the following caution resides:



According to the EOP Users Guide, which one of the following states the basis for this caution?

- A. Cold reference legs can provide higher RPV water level indication.
- B. Heated reference legs can provide higher RPV water level indication.
- C. Flashing variable legs can provide lower RPV water level indication.
- D. Flashing variable legs can provide erratic RPV water level indication.

Answer: B

Answer Explanation

QID: 10-1 NRO56		
Question #	56	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
295025 High Reactor Pressure / 3 2.4.20 - Emergency Procedures / Plan: Knowledge of operational implications of EOP warnings, cautions, and notes				3.8	4.3
Level	RO	Tier	1	Group	1
General References	RPV Control- with ATWS EOP	EOP User's Guide			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>B is Correct. EOP Users Guide provides the following (page 1A-51): The caution warns the operator that rapid depressurization of the RPV can cause flashing and possible loss of liquid inventory from the water level instrument reference legs resulting in erratic RPV water level indications substantially higher than actual. This effect applies only to RPV water level instruments with heated reference legs (YARWAY level instruments). Since heated reference leg temperatures seldom exceed 450F (saturation temperature for 500 psig), this phenomenon occurs only during rapid depressurization below 500 psig.</p> <p>A is Incorrect but plausible since it refers to a cold reference leg - not a heated reference leg. The applicant may confuse this difference.</p> <p>C & D are Incorrect but plausible since they refer to flashing in the variable legs - not the reference leg. The applicant may confuse this difference.</p>	
References to be provided during exam:	None	
Lesson Plan	2621.845.0.0052, RPV Control - no ATWS	
Learning Objective/	ENA-3056, Given a copy of RPV Control-no ATWS, describe in detail each Caution or Note, including the technical basis and how to verify conformance at any time.	

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified:			
VISION System/Question ID		510709	
Question Source		ILT 05-1 RO Audit Exam	
Cognitive Level	Memory or Fundamental Knowledge	X 1:B	Comprehension or Analysis
	NUREG 1021 Appendix B: Bases or purpose		
10CRF55 Content	55.41	10	55.43
	Administrative, normal, abnormal, and emergency operating procedures for the facility.		
Justification for LORT questions with K/A values < 3.0		N/A	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	295025	PRA:	NO
Safety Function:	3	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

57

ID: 10-1 NRO57

Points: 1.00

The plant was at rated power when an event resulted in the following annunciator:

- RX RECIRC PUMPS/DRIVES RECIRC PUMP A MG SET - DRV MOT BRKR TRIP A

After the plant becomes stable, the operator placed the recirculation loop in an IDLE condition in accordance with ABN-2, Recirculation System Failures.

Which of the following states the response of ACTUAL total core flow (flow through the core):

- (1) from when the annunciator came into alarm until the plant was stable, and
(2) as a result of the operator action?

ACTUAL total core flow will....

- A. (1) drop **ONLY**
(2) rise slightly
- B. (1) drop, then rise slightly
(2) rise slightly
- C. (1) drop **ONLY**
(2) remain the same
- D. (1) drop, then rise slightly
(2) remain the same

Answer: A

Answer Explanation

QID: 10-1 NRO57

Question #	57	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A	Importance Rating	
	RO	SRO

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4 AA2.03 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: Actual core flow				3.3	3.3
Level	RO	Tier	1	Group	1
General References	ABN-2	RAP-E1c			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>A is Correct. A Recirc pump trip results in a drop in ACTUAL total core flow (less flow through the core). When the operator place the recirc loop in an IDLE condion, more flow will be directed through the core and actual total core flow will rise slightly. Indicated total core flow however is different. Total indicated core flow will drop as the pump slows down. Forward flow through the loop stops (which represents the lowest core flow value) and then there will be reverse flow through the idle recirc loop driven by the remaining operating pumps. This reverse flow is sensed by the A Recirculation loop flow transmitters as flow through the loop. Total core flow is a summation of the recirculation loop flows. Total core flow rises from its minimum flow (when forward flow stopped) then raises slightly to account for the reverse flow in recirculation loop A. ABN-2 provides the definition of an idle recirculation loop as the discharge valve closed, and suction/discharge bypass valves as open. As the discharge valve is closed, indicated core flow will decrease.</p> <p>B is Incorrect. This distractor is plausible if the applicant confuses Actual core flow with Indicated core flow.</p> <p>C is Incorrect. This distractor is plausible if the applicant does not recall that placing a loop in an IDLE condition forces more actual flow through the core.</p> <p>D is Incorrect. This distractor is plausible if the applicant confuses Actual core flow with Indicated core flow and does not recall that placing a loop in an IDLE condition forces more actual flow through the core.</p>
References to be provided during exam:	None
Lesson Plan	2621.828.0.0038, Reactor Recirculation System
Learning Objective/	RRS-10445, Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Question Source (New, Modified, Bank)			Modified	
If Bank or Modified:				
VISION System/Question ID		510673		
Question Source		ILT 05-1 RO Audit Exam		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:PEO
	NUREG 1021 Appendix B: Predict an Event or Outcome			
10CRF55 Content	55.41	5	55.43	
	Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	295001	PRA:	NO	
Safety Function:	1 & 4	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

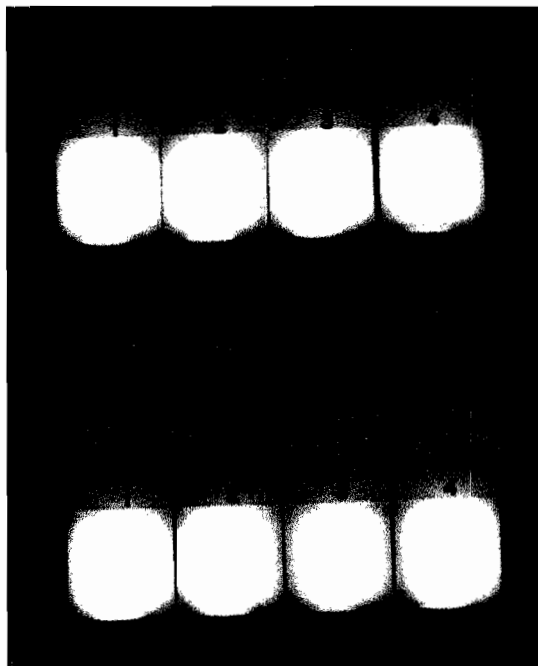
58

ID: 10-1 NRO58

Points: 1.00

The plant was at rated power when an event required the crew to manually scram the reactor. The following crew actions have been completed:

- **BOTH** MANUAL SCRAM BUS 1 and BUS 2 pushbuttons have been depressed
- The REACTOR MODE SELECTOR switch has been placed in SHUTDOWN
- **NO** additional operator actions have occurred
- Panel 4F indications include the following:



IAW EOPs, which **ONE** of the following can be used to determine if the reactor is SHUTDOWN under all conditions without boron?

SRM - Source Range Monitor
LPRM - Local Power Range Monitor
APRM - Average Power Range Monitor
RPIS - Rod Position Indication System

- A. SRM readings
- B. LPRM readings
- C. RPIS indications
- D. LPRM downscale lights

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Answer: C

Answer Explanation

QID: 10-1 NRO58

Question # 58 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A					Importance Rating	
					RO	SRO
295037 SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown / 1 EK2.14 - Knowledge of the interrelations between SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN and the following: RPIS: Plant-Specific					3.6	3.9
Level	RO	Tier	1	Group	1	
General References		RPV Control EOP	EOP User's Guide			
Explanation		C is Correct. IAW the EOP User's Guide, the reactor can be considered shutdown under all conditions without boron if all rods are at or beyond position 04 (RPIS indication). All distractors are Incorrect but plausible since they will all indicate reactor power, however in an ATWS condition, the RPV Control - with ATWS EOP only allows for all rods at or beyond position 04 to be used when transitioning to RPV Control - no ATWS.				
References to be provided during exam:		None				
Lesson Plan		2621.845.0.0053, RPV Control - with ATWS				
Learning Objective/		EWA-3053, Explain the basis for each of the RPV Control - with ATWS entry conditions.				

Question Source (New, Modified, Bank)	Modified
If Bank or Modified:	
VISION System/Question ID	560406
Question Source	Limerick ILT

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 2:DR
	NUREG 1021 Appendix B: Describing or recognizing Relationships			
10CRF55 Content	55.41	7	55.43	
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	295037	PRA:	NO	
Safety Function:	1	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

59

ID: 10-1 NRO59

Points: 1.00

The plant was at rated power when the Secondary Containment Control EOP, EMG-3200.11, was entered due to high area temperatures (not due to a fire).

Which of the following area leak detection system annunciators will indicate an automatic isolation of the affected system?

- A. Cleanup System area leak detection: CLEANUP SYSTEM - RWCU HELB annunciators
- B. Shutdown Cooling System area leak detection: SD HX CLG - SD HX PUMP RM TEMP HI annunciators
- C. Isolation Condenser System area leak detection: ISOL COND - COND AREA TEMP HI annunciators
- D. Trunion Room area leak detection: MAIN STEAM - TRUNION RM TEMP HI annunciators

Answer: A

Answer Explanation

QID: 10-1 NRO59		
Question #	59	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
295032 High Secondary Containment Area Temperature / 5 EK1.03 - Knowledge of the operational implications of the following concepts as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE: Secondary containment leakage detection: Plant-Specific				3.5	3.9
Level	RO	Tier	1	Group	2
General References	RAP-D1d	RAP-D2d			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>A is Correct. Cleanup system leaks will be annunciated by D-1-d and D-2-d (RWCU HELB at 160F) and by D-8-d (CU ROOM TEMP HI). The HELB annunciators, when alarmed simultaneously, will isolate the cleanup system at 160F area temperature.</p> <p>B is Incorrect but plausible. Shutdown cooling system leaks will be annunciated by C-8-d (SD HX PUMP RM TEMP HI) but provide no automatic actions.</p> <p>C is Incorrect but plausible. Isolation condenser leaks will be annunciated by C-8-b (COND AREA TEMP HI) but provide no automatic actions.</p> <p>D is Incorrect but plausible. Trunion room leaks will be annunciated by J-8-a (TRUNION RM TEMP HI) but provide no automatic actions.</p>		
References to be provided during exam:	None		
Lesson Plan	2621.828.0.0039, Reactor Water Cleanup		
Learning Objective/	RCU-10450, Describe and interpret procedure sections and steps for plant emergency or off-normal conditions that involve this system including personnel allocation and equipment operation IAW applicable ABN, SDRP, EOP & EOP support procedures and EP Procedures.		

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified:			
VISION System/Question ID		510835	
Question Source		ILT 05-1 RO NRC Exam	
Cognitive Level	Memory or Fundamental Knowledge	X 1:1	Comprehension or Analysis
	NUREG 1021 Appendix B: Interlocks, setpoints, or system (singular) response		
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Justification for LORT questions with K/A values < 3.0	N/A		
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	295032	PRA:	NO
Safety Function:	5	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

60

ID: 10-1 NRO60

Points: 1.00

Given the following conditions:

- RPV water level is 85 in and slowly lowering
- Drywell pressure is 8.6 psig and slowly rising
- Torus temperature is 96° F and rising
- EDG-1 is out of service
- 4160VAC Bus 1C MAIN BREAKER 1C is open

What operator actions are required by procedure and can be executed with the above conditions present?

- A. Start Containment Spray pump 51B and ESW pump 52B in Torus Cooling mode.
- B. Start Containment Spray pump 51C and ESW pump 52C in Torus Cooling mode.
- C. Start Containment Spray pump 51B and ESW pump 52B in Drywell Spray mode.
- D. Start Containment Spray pump 51C and ESW pump 52C in Drywell Spray mode.

Answer: B

Answer Explanation

QID: 10-1 NRO60

Question # 60 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
295013 High Suppression Pool Temperature / 5 AK2.01 - Knowledge of the interrelations between HIGH SUPPRESSION POOL TEMPERATURE and the following: Suppression pool cooling				3.6	3.1
Level	RO	Tier	1	Group	2

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

General References	EMG-SP25	BR 3001C	BR 3002 Sh. 2
Explanation	<p>B is Correct. The question stem provides a condition where Torus Temperature is above the Primary Containment Control EOP Entry of 95F. Torus Cooling is then directed to be put in service. Due to 4160VAC Bus 1C not having power, only System 2 Containment Spray/ESW Pumps have power (CS Pump 51C and ESW Pump 52C are in System 2).</p> <p>A is Incorrect but plausible if the applicant does not recognize that System 1 Containment Spray/ESW Pumps do not have any power.</p> <p>C is Incorrect. This distractor is plausible if the applicant does not recognize that System 1 Containment Spray/ESW Pumps do not have any power and that Drywell Sprays are not required (required at 12 psig Torus/Drywell pressure).</p> <p>D is Incorrect. This distractor is plausible if the applicant does not recognize that Drywell Sprays are not required.</p>		
References to be provided during exam:	None		
Lesson Plan	2621.828.0.0009, Containment Spray/ESW		
Learning Objective/	CNS-10445, Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.		

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified: VISION System/Question ID Question Source		607938 ILT 07-1 RO Comp #1		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 2:RI
	NUREG 1021 Appendix B: <u>Recognizing Interaction</u> between systems (plural), including consequences and implications			
10CRF55 Content	55.41	10	55.43	
	Administrative, normal, abnormal, and emergency operating procedures for the facility.			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Justification for LORT questions with K/A values < 3.0	N/A		
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	295013	PRA:	NO
Safety Function:	5	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

61

ID: 10-1 NRO61

Points: 1.00

The plant was at rated power. The following plant condition existed at the start of shift:

- DRYWELL PRESS indicates 1.21 psig

Plant conditions at the end of shift include the following:

- Annunciator DW PRESS HI/LO is in alarm
- DRYWELL PRESS indicates 1.45 psig

Consider the following two conditions below for Drywell Temperature from the start of shift to the end of shift:

- CONDITION (1): PPC indicates Drywell Temperature is **UNCHANGED**
- CONDITION (2): PPC indicates Drywell Temperature has **RISEN**

Which of the following could cause the indications for CONDITION (1) and CONDITION (2)?

- A. (1) The barometric pressure has fallen.
(2) A Drywell Recirc Fan has tripped.
- B. (1) Nitrogen has been added to the Drywell.
(2) A TBCCW pump has tripped.
- C. (1) Reactor Recirc Pump 'D' has tripped.
(2) Yarway reference leg has a small leak.
- D. (1) All Fuel Pool Cooling Pumps have tripped.
(2) Intake temperature has RISEN.

Answer: A

Answer Explanation

QID: 10-1 NRO61		
Question #	61	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information		
K&A	Importance Rating	
	RO	SRO

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

295010 High Drywell Pressure / 5						
AK3.05 - Knowledge of the reasons for the following responses as they apply to HIGH DRYWELL PRESSURE: Temperature monitoring					3.5	3.4
Level	RO	Tier	1	Group	2	
General References		RAP-C3f		Thermo - Units & Properties		
Explanation		A is Correct. The question stem provides a condition where Drywell Pressure has reached the DW PRESS HI/LO alarm. IAW RAP-C3f, Drywell Temperature must be checked due to determine cause of the DW pressure rise. To demonstrate the reason for and importance of checking (monitoring) DW Temperature, the question asks the applicant to recognize a condition where DW Pressure would rise without a change in DW Temp, and a condition where DW Pressure would rise with a concurrent rise in DW Temp. This is important to diagnose the cause of the DW pressure rise. For Condition 1, barometric (atmospheric) pressure falling would result in indicated DW Pressure rising. DW pressure is measured in gauge ($P_{\text{gauge}} = P_{\text{absolute}} - P_{\text{atmosphere}}$). For Condition 2, a trip of a Drywell Recirc Fan will result in Drywell Pressure and Temperature rising. RAP-C3f also has the applicant verify proper DW cooler operation.				
		B is Incorrect but plausible. For Condition 1, N2 added to the DW will result in DW Pressure rise without a change in DW Temp, however for Condition 2, a trip of a TBCCW pump will not cause DW Temperature to lower.				
		C is Incorrect but plausible. For Condition 1, a Recirc Pump trip will result in DW Press and Temp lowering.				
		D is Incorrect but plausible. For Condition 1, a trip of all Fuel Pool Cooling pumps will result in reduced RBCCW temperature due to heat no longer being removed from the Fuel Pool Heat Exchanger. DW Press and Temp will lower. The applicant may believe this will have to affect on DW Temp, however DW Pressure would not have risen.				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

References to be provided during exam:	None	
Lesson Plan	2621.828.0.0032, Primary Containment	
Learning Objective/	PCS-432, Interpret given control room and/or local Primary Containment system indications and evaluate them in terms of limits and trends, using available data.	

Question Source (New, Modified, Bank)			Modified	
If Bank or Modified: VISION System/Question ID		666827		
Question Source		ILT 08-1 RO Audit Exam		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 2:RI
	NUREG 1021 Appendix B: Recognizing Interaction between systems (plural), including consequences and implications			
10CRF55 Content	55.41	5	55.43	
	Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	295010	PRA:	NO	
Safety Function:	5	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

62

ID: 10-1 NRO62

Points: 1.00

The reactor was at rated power when the following annunciator came into alarm:

- TURBINE VAC/SEALS – COND VAC LO 25 INCHES

The reactor operator lowered recirculation flow as directed by the associated RAP/ABN. Condenser vacuum has now recovered to 25.8 in Hg and is steady. The Unit Supervisor then directs you to restore RPV pressure to the pre-event value by adjusting the EPR.

Which of the following lists the required action and its effect?

Take the EPR RELAY POSITION control switch to (1) position which will cause MWe to (2).

	(1)	(2)
A.	LOWER (↑%)	lower
B.	LOWER (↑%)	rise
C.	RAISE (↓%)	rise
D.	RAISE (↓%)	lower

Answer: D

Answer Explanation

QID: 10-1 NRO62

Question #	62	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
295002 Loss of Main Condenser Vac / 3 AA1.06 - Ability to operate and/or monitor the following as they apply to LOSS OF MAIN CONDENSER VACUUM: Reactor/turbine pressure regulating system				3.0	3.1
Level	RO	Tier	1	Group	2

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

General References	315.5 202.1	RAP-Q3c	ABN-14
Explanation	<p>D is Correct. As power is reduced, the EPR relay position also goes down (proportional to turbine load). To raise RPV pressure back up, the turbine control valves must close down some. Lowering the EPR relay position even further will do this (Raise (↓%)). As the TCV close down some, RPV pressure will rise. Therefore, the EPR relay position must be taken to the RAISE position, which will cause turbine control valves to close further, causing RPV pressure to rise, control valves close and electrical output lowers.</p> <p>All distractors are Incorrect but plausible since they either manipulate the switch in the incorrect direction or the plant effect is incorrect. The applicant may also confuse where RPV pressure was at following the power reduction compared to its initial value which will result in an incorrect answer.</p>		
References to be provided during exam:	None		
Lesson Plan	2621.828.0.0051, Turbine Controls		
Learning Objective/	TCS-10446, Identify and explain system operating controls / indications under all plant operating conditions.		

Question Source (New, Modified, Bank)		Bank		
If Bank or Modified: VISION System/Question ID Question Source		606550 ILT 05-1 RO NRC Exam		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:PEO
	NUREG 1021 Appendix B: <u>Predict an Event or Outcome</u>			
10CRF55 Content	55.41	7	55.43	
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Justification for LORT questions with K/A values < 3.0	N/A		
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	295002	PRA:	NO
Safety Function:	3	<input checked="checked" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

63

ID: 10-1 NRO63

Points: 1.00

Given the following conditions:

- Plant is at rated power
- 'A' CRD pump is **NOT** available for operation
- 'B' CRD pump trips and **CANNOT** be restarted
- Annunciator CHAR WTR PRESS LO is in alarm

Which of the following conditions requires a Reactor Scram?

- A. Two or more CRD high temperature alarms are received.
- B. Two or more CRD accumulator trouble alarms are received.
- C. Five minutes after the 'B' CRD pump trips one CRD pump is still **NOT** operating.
- D. Five minutes after the 'B' CRD pump trips one CRD accumulator trouble alarm is received.

Answer: B

Answer Explanation

QID: 10-1 NRO63		
Question #	63	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
295022 Loss of CRD Pumps / 1 AA2.01 - Ability to determine and/or interpret the following as they apply to LOSS OF CRD PUMPS: Accumulator pressure				3.5	3.6
Level	RO	Tier	1	Group	2
General References	RAP-H2c				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>B is Correct. IAW RAP-H2c, if Reactor pressure is > 850 psig (stem states plant is at rated power), CRD flow cannot be immediately established, and two or more CRD accumulator pressure alarms are received (accumulator pressure alarm will be received for loss of both CRD pumps), then manually scram the reactor. The applicant must be able to determine that two accumulator pressure alarms have been received in order to execute the procedure correctly. Two accumulator alarms are signified by the accumulator trouble annunciator accompanied by an accumulator rod block.</p> <p>All distractors are Incorrect but plausible if the applicant does not recall actions required for a trip or both CRD pumps.</p>	
References to be provided during exam:	None	
Lesson Plan	2621.828.0.0011, CRD & Hydraulics	
Learning Objective/	CRD-10449, State the function and interpretation of system alarms, alone and in combination, as applicable in accordance with the system RAPS.	

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified: VISION System/Question ID Question Source		505739 CRD-23		
Cognitive Level	Memory or Fundamental Knowledge	X 1:P	Comprehension or Analysis	
	NUREG 1021 Appendix B: Procedure steps and cautions			
10CRF55 Content	55.41	10	55.43	
	Administrative, normal, abnormal, and emergency operating procedures for the facility.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes		Point Value: 1		
System ID No.:	295022	PRA:	NO	
Safety Function:	1	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

64

ID: 10-1 NRO64

Points: 1.00

Complete the following sentences:

The NE Corner Room water level can be **CONFIRMED** at the MAX SAFE value by (1).

(2) are not considered OPERABLE at water level greater than MAX SAFE in the NE Corner Room.

- A. (1) a valid 1-7 Sump HI LEVEL alarm.
(2) System 1 Core Spray Pumps
- B. (1) an EO reporting water level is at the RED LINE.
(2) System 1 Core Spray Pumps
- C. (1) a valid 1-7 Sump HI LEVEL alarm.
(2) System 1 Containment Spray Pumps
- D. (1) an EO reporting water level is at the RED LINE.
(2) System 1 Containment Spray Pumps

Answer: D

Answer Explanation

QID: 10-1 NRO64		
Question #	64	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
295036 Secondary Containment High Sump/Area Water Level / 5 2.4.35 - Emergency Procedures / Plan: Knowledge of local auxiliary operator tasks during emergency and the resultant operational effects.				3.8	4.0
Level	RO	Tier	1	Group	2
General References	SCC EOP	EOP User's Guide			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>D is Correct. IAW the EOP User's Guide, the MAX SAFE level of 16" in the Corner Rooms is signified by a RED LINE (painted) on the wall in the room. An EO must be dispatched to verify level visually in the Corner Rooms. System 1 Containment Spray Pumps are located in the NE Corner Room.</p> <p>All distractors are Incorrect but plausible. The 1-7 Sump Hi Level Alarm in New Radwaste signifies the water may exist in the corner rooms and requires entry into Secondary Containment Control, however this is a Max Normal value, not Max Safe. In addition, the operator may be confused by which System 1 components are in the NE Corner Room (Containment Spray Pumps or Core Spray Pumps).</p>		
References to be provided during exam:	None		
Lesson Plan	2621.845.0.0057, Secondary Containment Control		
Learning Objective/	<p>SCC-1667, Based upon specific plant parameters and conditions, determine if entry conditions into EOPs have been met and determine which EOPs are applicable to the conditions provided.</p>		

Question Source (New, Modified, Bank)		New	
If Bank or Modified:		N/A	
VISION System/Question ID			
Question Source			
Cognitive Level	Memory or Fundamental Knowledge	X 1:P 1:S	Comprehension or Analysis
	NUREG 1021 Appendix B: Procedure steps and cautions; Structures and locations		
10CRF55 Content	55.41	10	55.43
	Administrative, normal, abnormal, and emergency operating procedures for the facility.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	295036	PRA:	NO
Safety Function:	5	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

65

ID: 10-1 NRO65

Points: 1.00

The plant was at 50% power when an event resulted in the crew inserting a manual scram due to lowering RPV water level. Plant conditions include the following:

- RPV water level continues to lower

IAW ABN-1, Reactor Scram, as RPV level continues to lower, at which point, if any, is the crew **REQUIRED** to perform the following actions below?

- Exit ABN-1 (ie. stop controlling RPV water level IAW ABN-1) **AND**;
 - Enter and use the RPV Control - no ATWS EOP for level control
- A. When directed by the US **ONLY**.
- B. When RPV water level is less than 138" **ONLY**.
- C. ABN-1 will always be performed concurrently with EOPs.
- D. When RPV water level is less than 138" **AND** directed by the US.

Answer: D

Answer Explanation

QID: 10-1 NRO65		
Question #	65	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
295009 Low Reactor Water Level / 2 2.4.8 - Emergency Procedures / Plan: Knowledge of how abnormal operating procedures are used in conjunction with EOP's.				3.8	4.5
Level	RO	Tier	1	Group	2
General References	ABN-1				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>D is Correct. IAW ABN-1, if RPV water level goes below 138" post scram, Notify the US, EXIT ABN-1, and Enter EOP level control when directed by the US.</p> <p>All distractors are Incorrect but plausible if the applicant is not familiar with the procedural requirements to transition from ABN-1 level control to level control IAW EOP support procedures.</p>	
References to be provided during exam:	None	
Lesson Plan	2621.882.0.0001, Reactor Scram	
Learning Objective/	ABN-1, Perform actions required by ABN-1: Reactor Scram	

Question Source (New, Modified, Bank)		New	
If Bank or Modified: VISION System/Question ID Question Source		N/A	
Cognitive Level	Memory or Fundamental Knowledge	X 1:P	Comprehension or Analysis
	NUREG 1021 Appendix B: Procedure steps and cautions		
10CRF55 Content	55.41	10	55.43
	Administrative, normal, abnormal, and emergency operating procedures for the facility.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	295009	PRA:	NO
Safety Function:	2	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

66

ID: 10-1 NRO66

Points: 1.00

A reactor startup is in progress with the following conditions:

- The 'A' Feed String is in service on the 'A' Low Flow Reg Valve
- One Turbine Bypass Valve is open

An overload trip of the 'A' Reactor Feed Pump then occurs. IAW station procedures, which of the following actions are required by the URO?

- A. Immediately insert a manual scram, then inform the US the scram was inserted due to approaching a scram setpoint.
- B. Announce the 'A' Reactor Feed Pump tripped, pause to ensure the US received the communication, then immediately perform a Rapid Power Reduction.
- C. Announce the 'A' Reactor Feed Pump tripped, immediately start another feed pump, then update the US on critical plant parameters once RPV level has stabilized.
- D. Announce the 'A' Reactor Feed Pump tripped and intention to scram, pause to ensure the US received the communication, then immediately insert a Manual Scram.

Answer: D

Answer Explanation

QID: 10-1 NRO66		
Question #	66	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
2.1.39 - Knowledge of conservative decision making practices.				3.6	4.3
Level	RO	Tier	3	Category	COO
General References	OP-OC-101-111-1001	ABN-17		ABN-1	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>D is Correct. The question stem provides a condition where a plant startup is in progress with one feed pump in operation. An overload trip of the feed pump will required a manual scram due to lowering RPV water level approaching the Low Level Scram Setpoint. ABN-17, Feedwater System Abnormal Conditions will direct inserting a manual scram. OP-OC-101-111-1001, Strategies For Successful Transient Mitigation, provides further conservative decision making guidance and directs the operator to announce that the 'A' Feed Pump has tripped, pause to ensure the US received the communication, then immediately insert a manual scram. ABN-1, Reactor Scram, also implies that a manual scram should be inserted BEFORE reaching an automatic scram setpoint which provides positive operator control over the plant.</p>	
	<p>A is Incorrect but plausible if the applicant does not recall the conservative decision making guidance provided in Strategies For Successful Transient Mitigation.</p>	
	<p>B is Incorrect. This distractor is plausible this this is the correct action for a single feed pump trip, however this situation implies the reactor had all 3 feed pumps running and was above 70% power.</p>	
	<p>C is Incorrect. This distractor is plausible if the applicant does not recall immediate actions of ABN-17 for feed pump trips.</p>	
References to be provided during exam:	None	
Lesson Plan	2621.830.0.0017, Conduct of Operations - Admin	
Learning Objective/	2.1.39, Knowledge of conservative decision making practices.	

Question Source (New, Modified, Bank)		New		
If Bank or Modified: VISION System/Question ID Question Source		N/A		
Cognitive Level	Memory or Fundamental Knowledge	X 1:P	Comprehension or Analysis	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

	NUREG 1021 Appendix B: Procedure steps and cautions		
10CRF55 Content	55.41	10	55.43
	Administrative, normal, abnormal, and emergency operating procedures for the facility.		
Justification for LORT questions with K/A values < 3.0	N/A		
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	N/A	PRA:	NO
Safety Function:	N/A	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

67

ID: 10-1 NRO67

Points: 1.00

The plant was at rated power when an event occurred. Indications and investigations revealed the following:

- Battery Charger MG Set A Breaker has opened.
- Battery A Main Breaker has opened.

Which of the following states the proper function of a DC Distribution System Automatic Transfer Switch under the given conditions?

The power to 125 VDC Bus (1) has automatically transferred to 125 VDC Bus (2).

	(1)	(2)
A.	DC-F	DC-C
B.	DC-1	DC-C
C.	DC-2	DC-B
D.	DC-E	DC-B

Answer: D

Answer Explanation

QID: 10-1 NRO67

Question #	67	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
2.1.28 - Knowledge of the purpose and function of major system components and controls.				4.1	4.1
Level	RO	Tier	3	Category	COO
General References	RAP-9XF4e				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>D is Correct. The question stem describes a loss of power to 125 VDC Bus DC-A (both the battery charger and battery become disconnected from the Bus). When this bus de-energizes, then automatic transfer switch DC-E swaps from DC-A as the source of input power to 125 VDC Bus DC-B.</p> <p>A is Incorrect but plausible if the applicant does not recall Bus DC-F normally receives power from Bus DC-C, which is not affected by the loss of DC-A.</p> <p>B is Incorrect but plausible if the applicant does not recall Bus DC-1 normally receives power from Bus DC-B, which is not affected by the loss of DC-A.</p> <p>C is Incorrect but plausible if the applicant does not recall Bus DC-2 normally receives power from Bus DC-C, which is not affected by the loss of DC-A.</p>		
References to be provided during exam:	None		
Lesson Plan	2621.830.0.0017, Conduct of Operations - Admin		
Learning Objective/	2.1.28, Knowledge of the purpose and function of major system components and controls.		

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified:			
VISION System/Question ID		606388	
Question Source		ILT 07-1 RO NRC Exam	
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis
			X 3:SPK
NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	N/A	PRA:	NO
Safety Function:	N/A	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

68

ID: 10-1 NRO68

Points: 1.00

The reactor is in COLD SHUTDOWN and pre-startup evolutions are in progress. The 'B' Reactor Recirculation Pump is being placed in service and is aligned as follows:

- The MG set drive motor breaker is shut
- The scoop tube is positioned at 100%
- The WARM light has just illuminated

Which one of the following describes what happens when the STRT/NORM pushbutton is depressed?

- A. The field breaker will close immediately and the scoop tube will remain at 100%.
- B. The field breaker will close immediately and the scoop tube will start running back.
- C. The scoop tube will start running back and the field breaker will close when the scoop tube reaches the low speed position.
- D. The scoop tube will start running back and the field breaker will close when the scoop tube passes through the 40% to 30% range.

Answer: D

Answer Explanation

QID: 10-1 NRO68		
Question #	68	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
2.2.1 - Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.				4.5	4.4
Level	RO	Tier	3	Category	EQC
General References	301.2				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>D is Correct. The question stem provides a condition where a plant pre-startup evolutions are in progress with the 'B' Recirc Pump being placed in service. As soon as the STRT/NORM pushbutton is depressed the scoop tube begins to run back. When it reaches the 40-30% position, the field breaker will close and the recirc pump will start. The scoop tube will continue to run back to the low speed position.</p> <p>All distractors are Incorrect but plausible if the applicant does not recall the correct startup sequence for Recirculation Pumps.</p>
References to be provided during exam:	None
Lesson Plan	2621.830.0.0018, Equipment Control - Admin
Learning Objective/	2.2.1, Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified: VISION System/Question ID Question Source		510894 ILT 05-1 RO NRC Exam		
Cognitive Level	Memory or Fundamental Knowledge	X 1:P	Comprehension or Analysis	
	NUREG 1021 Appendix B: Procedure steps and cautions			
10CRF55 Content	55.41	10	55.43	
	Administrative, normal, abnormal, and emergency operating procedures for the facility.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes		Point Value: 1		
System ID No.:	N/A	PRA:	NO	
Safety Function:	N/A	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

69

ID: 10-1 NRO69

Points: 1.00

The plant is at rated power. You have just come in for day shift turnover and plant status includes the following:

- 'A' Standby Liquid Control Pump was removed from service at 0300 today
- A 7 day LCO IAW Tech Spec 3.2.C, Standby Liquid Control System, was entered.

Which of the following maintenance activities, if it resulted in tripping the breaker, will **DIRECTLY** impact the LCO for Tech Spec 3.2.C?

- A. MCC 1B21
- B. MCC 1B22
- C. MCC 1B23
- D. MCC 1B24

Answer: A

Answer Explanation

QID: 10-1 NRO69						
Question #		69		Developer / Date: JJR / 7-11-11		
Knowledge and Ability Reference Information						
K&A				Importance Rating		
				RO	SRO	
2.2.36 - Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.				3.1	4.2	
Level	RO		Tier	3	Category	EQC
General References		Tech Spec 3.2.C		BR 3004 Sh. 3		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>A is Correct. The question stem provides a condition where the 'A' Standby Liquid Control (SLC) Pump was removed from service and the plant is in a 7 day LCO. The 'B' SLC Pump is powered from MCC 1B21. A loss of this MCC will result in a loss of all SLC pumps and the plant must be brought to a COLD SHUTDOWN condition within 24 hrs. It is not required knowledge for the RO applicant to know what the LCO is, however it is RO required knowledge to recognize that the LCO was impacted by the loss of the redundant SLC pump.</p> <p>All distractors are Incorrect but plausible if the applicant doesn't recall the correct power supply to the B SLC pump.</p>	
References to be provided during exam:	None	
Lesson Plan.	2621.850.0.0090, Overview and Highlights of Technical Specifications	
Learning Objective/	TSX-1920, Given various plant indications, evaluate the indications to determine plant status with respect to operating license and technical specifications.	

Question Source (New, Modified, Bank)		New	
If Bank or Modified: VISION System/Question ID Question Source		N/A	
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis
			X 2:DR
NUREG 1021 Appendix B: Describing or recognizing Relationships			
10CRF55 Content	55.41	10	55.43
	Administrative, normal, abnormal, and emergency operating procedures for the facility.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	N/A	PRA:	NO
Safety Function:	N/A	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

70

ID: 10-1 NRO70

Points: 1.00

Given the following plant conditions:

- The plant is operating at 100% power.
- Operators note rising Off-Gas Radiation Levels on RN-05E & 05F [Off Gas Channel 1 & 2 radiation monitors on 1R].
- At 10:30 both monitors read 100 mr/hr
- The readings are rising at the rate of 150 mr/hr every 5 minutes

Based on these conditions, when will the augmented off-gas (AOG) system automatically isolate? (Use actual setpoint values)

Time of AOG Isolation

- A. 11:00
- B. 11:15
- C. 11:30
- D. 12:15

Answer: B

Answer Explanation

QID: 10-1 NRO70

Question #	70	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
2.3.15 - Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.				2.9	3.1
Level	RO	Tier	3	Category	RPT
General References	RAP-10F1c				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	B is Correct. V-7-31/29 and OG-AOV-001A(B) isolate the off-gas system at the stack after a 14-15 minute time delay with coincident upscale trips of both channels at 1000 mr/hr (Off Gas Hi-Hi alarm). 1000 mr/hr is reached at 1100, at 1115 AOG isolation occurs. Increasing A/E off-gas radiation levels is an indication of leaking fuel (cladding failure). (TS value for high radiation in off-gas is 2000 mr/hr). All distractors are Incorrect but plausible if the applicant doesn't recall the correct setpoint value for the Off Gas Hi-Hi alarm or doesn't recall the isolation logic.		
References to be provided during exam:	None		
Lesson Plan	2621.828.0.033A, Plant Radiation Monitoring System		
Learning Objective/	RAD-10453, Explain or describe how this system is interrelated with other plant systems.		

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified:			
VISION System/Question ID		607956	
Question Source		ILT 07-1 RO Comp #1	
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis
			X 2:RI
NUREG 1021 Appendix B: Recognizing Interaction between systems (plural), including consequences and implications			
10CRF55 Content	55.41	7	55.43
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	N/A	PRA:	NO
Safety Function:	N/A	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

71

ID: 10-1 NRO71

Points: 1.00

The plant was at power when it was determined that an Operator needed to enter an area inside the RCA where the dose rate was 1100 mrem/hr. (This was a non-emergency evolution.)

IAW RP-AA-460, Controls for High and Very High Radiation Areas, which of the following are correct in order to enter the room to isolate the leak?

- Prior to entry, a briefing must be conducted by (1) .
- The key for entry will be issued by (2) .

	(1)	(2)
A.	OPS	OPS
B.	RP	RP
C.	RP	OPS
D.	OPS	RP

Answer: B

Answer Explanation

QID: 10-1 NRO71

Question #	71	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
2.3.12 - Knowledge of Radiological Safety Principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.				3.2	3.7
Level	RO	Tier	3	Category	RPT
General References	RP-AA-460				

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>B is Correct. IAW the reference, the area will be classified as a locked high radiation area (≥ 1000 mrem at 30 cm in 1 hour). Also, the procedure requires a briefing by RP, with keys issued by RP. The procedure does account for master keys to be used in times of an emergency, but the question stem states that this is not an emergency.</p> <p>All distractors are Incorrect but plausible. They provide either the incorrect area designation, incorrect briefing provider or incorrect key issuer.</p>
References to be provided during exam:	None
Lesson Plan	2621.830.0.0015, Radiation Control - Admin
Learning Objective/	2.3.12, Knowledge of Radialogical Safety Principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified: VISION System/Question ID Question Source		667552 ILT 08-1 RO Audit Exam		
Cognitive Level	Memory or Fundamental Knowledge	X 1:P	Comprehension or Analysis	
	NUREG 1021 Appendix B: Procedure steps and cautions			
10CRF55 Content	55.41	12	55.43	
	Radiological safety principles and procedures.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes		Point Value: 1		
System ID No.:	N/A	PRA:	NO	
Safety Function:	N/A	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

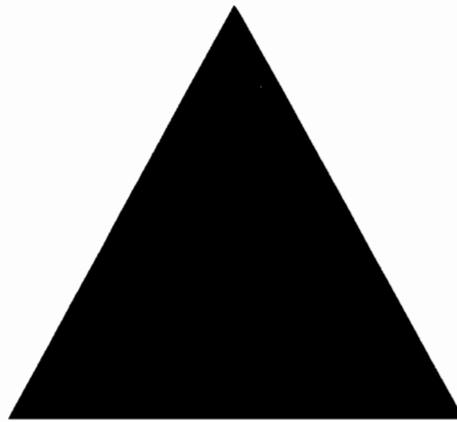
ILT 10-1 NRC RO Exam

72

ID: 10-1 NRO72

Points: 1.00

Which of the following states the definition of the following EOP symbol?



This designates a Support Procedure

- A. as high **Importance**.
- B. may override plant **Interlocks**.
- C. could cause an **Increase** in off-site release rate.
- D. to be completed **Immediately**, and without delay, once started.

Answer: B

Answer Explanation

QID: 10-1 NRO72

Question # 72 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
2.4.19 - Knowledge of EOP layout, symbols, and icons.				3.4	4.1
Level	RO	Tier	3	Category	EOP

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

General References	EOP User's Guide		
Explanation	<p>B is Correct. IAW the EOP User's Guide, the symbol designates that a support procedure will override plant interlocks.</p> <p>All distractors are Incorrect but plausible if the applicant does not recall the correct definition for this EOP symbol.</p>		
References to be provided during exam:	None		
Lesson Plan	2621.830.0.0016, Emergency Procedures / Plan - Admin		
Learning Objective/	2.4.19, Knowledge of EOP layout, symbols, and icons.		

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified:			
VISION System/Question ID		608088	
Question Source		ILT 07-1 RO Audit Exam	
Cognitive Level	Memory or Fundamental Knowledge	X 1:D	Comprehension or Analysis
	NUREG 1021 Appendix B: Definitions		
10CRF55 Content	55.41	10	55.43
	Administrative, normal, abnormal, and emergency operating procedures for the facility.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	N/A	PRA:	NO
Safety Function:	N/A	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

73

ID: 10-1 NRO73

Points: 1.00

The plant was at rated power when RPV pressure spiked to 1055 psig. The following plant conditions currently exist:

- RPV water level indicates 155"
- The Operator has depressed both MANUAL SCRAM pushbuttons, and has placed the REACTOR MODE SELECTOR switch in SHUTDOWN
- APRMs indicate > 2% power

IAW OP-OC-101-111-1001, Strategies for Successful Transient Mitigation, which of the following actions is immediately required under the conditions given, and the correct reason for the action?

- A. Place **ALL** Recirculation MG Set DRIVE MOTOR switches to STOP to reduce reactor power.
- B. Depress the ALT ROD INJECTION INITIATION pushbutton to energize the ARI solenoids.
- C. Place the SLC keylock switch in FIRE SYS 1 (or 2) to initiate the Standby Liquid Control System.
- D. Place the ROPS switch in BYPASS since over-fill protection will **NOT** function as designed under the conditions that currently exist.

Answer: B

Answer Explanation

QID: 10-1 NRO73

Question #	73	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
2.4.1 - Knowledge of EOP entry conditions and immediate action steps.				3.6	4.3
Level	RO	Tier	3	Category	EOP
General References	OP-OC-101-111-1001	EOP User's Guide			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>B is Correct. The plant was at power when an RPV over-pressure event occurred. The reactor should have scrammed at 1045 psig, but indications show that an ATWS is in-progress. IAW OP-OC-101-111-1001, and RPV Control - with ATWS EOP, the Panel 4F Operator shall depress the scram button, place the mode switch in shutdown, and initiate ARI. The ARI solenoids are de-energized and are inter-locked de-energized until manually initiated, or automatically from RPV high pressure (1090 psig) or from RPV water level lo-lo (90"). When ARI is initiated, vent valve solenoids and the ARI isolation valve solenoids energize to isolate/vent the scram air header. This allows the scram valves to open to allow the CRD hydraulics to insert more control rods.</p> <p>A is Incorrect but plausible. The same reference directs the panel operator to take recirculation flow to minimum - not to trip the pumps/MG.</p> <p>C is Incorrect but plausible. Initiating SLC is only directed from the ATWS EOP.</p> <p>D is Incorrect but plausible. The reference also directs the Operator to place ROPS in BYPASS, but the EOP Users Guide states this is done to prevent an inadvertent FW pump trip - not because ROPS is not designed during an ATWS.</p>
References to be provided during exam:	None
Lesson Plan	2621.845.0.0053, RPV Control - with ATWS
Learning Objective/	EWA-3052, State the plant conditions requiring entry into RPV Control - with ATWS.

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified: VISION System/Question ID Question Source		718212 ILT 09-1 RO Audit Exam	
Cognitive Level	Memory or Fundamental Knowledge	X 1:P	Comprehension or Analysis
	NUREG 1021 Appendix B: Procedure steps and cautions		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

10CRF55 Content	55.41	10	55.43	
	Administrative, normal, abnormal, and emergency operating procedures for the facility.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	N/A	PRA:	NO	
Safety Function:	N/A	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

74

ID: 10-1 NRO74

Points: 1.00

A plant startup is in-progress with the following conditions:

- The REACTOR MODE switch is in STARTUP, with control rod withdrawals in-progress.
- IRMs 11, 12, 15, 16, 18 read 72-74 % of scale on Range 1.
- IRMs 13, 14, and 17 read 10 % of scale on Range 2.

A malfunction in the IRM drive circuitry caused IRM 13 to withdraw to the full-out position.

Which of the following states the effect on the plant and the required Operator actions to continue withdrawing control rods?

- A. There are panel annunciators **ONLY**; withdrawing control rods may continue without any other control panel manipulations.
- B. There are panel annunciators and a rodblock from IRM downscale **ONLY**; bypassing the IRM is required to continue withdrawing control rods.
- C. There are panel annunciators and a rodblock from IRM downscale **AND** IRM detector position; bypassing the IRM is required to continue withdrawing control rods.
- D. There are panel annunciators, a rodblock and a 1/2 scram; bypassing the IRM and resetting the 1/2 scram is required to continue withdrawing control rods.

Answer: C

Answer Explanation

QID: 10-1 NRO74		
Question #	74	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information		
K&A	Importance Rating	
	RO	SRO
2.2.2 - Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.	4.6	4.1

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Level	RO	Tier	3	Category	EQC
General References	RAP-H7a		402.4		
Explanation	<p>C is Correct. The following IRM parameters provide rodblocks only (no scram input): IRM downscale (in REFUAL and STARTUP; bypassed in Range 1 or in RUN), detector not fully inserted (bypassed in RUN), and IRM high (bypassed in RUN). When the IRM comes off the full-in position, a rodblock is instituted (plus panel annunciators). It is expected that the IRM will also go downscale as it drives to the fully withdrawn position (downscale also gives a rodblock except in Range 1). There are no 1/2 scrams from these conditions. Therefore, to continue to move control rods, IRM 13 (which is instituting a rodblock both from downscale and IRM position) must be bypassed.</p> <p>A is Incorrect but plausible if the applicant does not recall that rodblocks should exist.</p> <p>B is Incorrect but plausible if the applicant does not recall that a rodblock should exist for IRM detector position also.</p> <p>D is Incorrect but plausible if the applicant does not recall that there should not be a 1/2 scram for these conditions.</p>				
References to be provided during exam:	None				
Lesson Plan	2621.828.0.0029, Nuclear Instrumentation				
Learning Objective/	NIS-10445, Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.				

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified: VISION System/Question ID		510857		
Question Source		ILT 05-1 RO NRC Exam		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:PEO
	NUREG 1021 Appendix B: Predict an Event or Outcome			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

10CRF55 Content	55.41	6	55.43	
	Design, components, and functions of reactivity control mechanisms and instrumentation.			
Justification for LORT questions with K/A values < 3.0	N/A			
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	N/A	PRA:	NO	
Safety Function:	N/A	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

75

ID: 10-1 NRO75

Points: 1.00

The plant was at rated power when a large break **LOCA and ATWS** occur. Plant conditions include the following:

- RPV water level is -18" and lowering

Which **ONE** of the following sources of water does the RPV Control - with ATWS EOP recommend as the **LOWEST** priority (**LAST** alternative) for makeup to the RPV **AND** IAW the EOP User's Guide, what is a basis for this priority?

- A. Fire Water via the Core Spray system due to its corrosive affect on core components.
- B. Condensate Transfer via the Core Spray system due to its low discharge head and flow rate.
- C. The Feedwater/Condensate system since it is secured while Terminating and Preventing Injection.
- D. The Core Spray System since it will result in large quantities of cold, unborated water injecting inside the core shroud.

Answer: D

Answer Explanation

QID: 10-1 NRO75

Question #	75	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
2.4.22 - Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.				3.6	4.4
Level	RO	Tier	3	Category	EOP
General References	RPVC - with ATWS EOP	EOP User's Guide			

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Explanation	<p>D is Correct. IAW the EOP User's Guide, the Core Spray System is used only after all other sources of injection have proven inadequate for restoring and maintaining RPV level above -20 in. The Core Spray System has two significant drawbacks:</p> <ol style="list-style-type: none"> 1. Injection into the RPV occurs inside the shroud, not outside the shroud, where the relatively cold, unborated water injected by Core Spray would not have an opportunity to mix with the warm, borated water in the lower plenum before reaching the core. 2. Since the Core Spray injection valves are unable to be remotely throttled, injection into the RPV cannot be readily controlled, resulting in large quantities of relatively cold, unborated water entering the core region directly from the Core Spray sparger. <p>The combination of these two factors makes the choice of operating the Core Spray System the least desirable alternative for providing RPV injection when the Reactor may be critical or just barely subcritical. However, the undesirable consequences of prolonged uncovering of the core and loss of adequate core cooling requires operation of the Core Spray System even at the risk of a Reactor power excursion.</p> <p>All distractors are Incorrect but plausible due to being actual sources of makeup water. The applicant may not recall the bases for makeup water priority or confuse the priority.</p>
References to be provided during exam:	None
Lesson Plan	2621.845.0.0053, RPV Control - with ATWS
Learning Objective/	EWA-3054, Describe the parameters monitored and controlled by the RPV Control EOP.

Question Source (New, Modified, Bank)	New
If Bank or Modified: VISION System/Question ID Question Source	N/A

EXAMINATION ANSWER KEY

ILT 10-1 NRC RO Exam

Cognitive Level	Memory or Fundamental Knowledge	X 1:B	Comprehension or Analysis	
	NUREG 1021 Appendix B: Bases or purpose			
10CRF55 Content	55.41	10	55.43	
	Administrative, normal, abnormal, and emergency operating procedures for the facility.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	N/A	PRA:	NO	
Safety Function:	N/A	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

1

ID: 10-1 NSRO1

Points: 1.00

The plant was at 50% power when an event occurred due to electrical bus losses. Present plant conditions are as follows:

- All ARPM drawers have failed downscale
- All control rod position indications have been lost
- GD1 and GC1 are open
- Both Isolation condensers are in-service
- RPV Pressure is 1000 psig and stable
- MSIVs are closed
- Drywell pressure is 3.1 psig and steady
- Torus water temperature is 90 °F and steady

Which of the following actions is required?

- A. Place the ADS TIMER switches to BYPASS per RPV Control - with ATWS EOP Level/Power Leg.
- B. Transfer RPV pressure control to the EMRVs **ONLY** per RPV Control - with ATWS EOP Pressure Leg.
- C. Place one Containment Spray System in the Torus Cooling Mode per Primary Containment Control EOP Torus Temperature Leg.
- D. Maintain RPV water level 138" – 175" with Feedwater/Condensate and/or CRD per RPV Control - no ATWS EOP Level Leg.

Answer: A

Answer Explanation

QID: 10-1 NSRO1

Question #	1	Developer / Date: JJR / 7-11-11
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EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Knowledge and Ability Reference Information						
K&A					Importance Rating	
					RO	SRO
295006 SCRAM / 1 AA2.05 - Ability to determine and/or interpret the following as they apply to SCRAM : Whether a reactor SCRAM has occurred					4.6	4.6
Level	SRO	Tier	1	Group	1	
General References	RPVC - with ATWS EOP		EOP User's Guide			
Explanation	A is Correct. The question stem describes an event where a scram should have occurred (loss of power to all APRMs gives INOPs to both RPS 1 and 2; also indications that the generator has tripped), but both primary indicators of the reactor shutdown, APRMs and control rod position indication, are lost. But with both isolation condensers in-service and reactor pressure constant at 1000 psig, then all steam generated is going to the ICs (6%) and the RPV is not cooling down. Therefore, reactor power is 6%. Thus, an ATWS has occurred with power at 6%. Placing ADS in bypass is required in the level/power leg of the ATWS EOP.					
	B is Incorrect but plausible. The ATWS EOP allows RPV pressure with ICs or EMRVs, or other systems, but there is no requirement to transfer from one method that is working OK to another.					
	C is Incorrect but plausible. The stem also provides entry into the primary containment control EOP on DW pressure. Torus cooling is initiated to maintain torus temperature < 95 °F. The stem says it is 90 °F and steady – thus there is no need to start it.					
	D is Incorrect. The RPV water level (answer D) is found both in the RPV Control – w/o ATWS EOP, and in the ATWS EOP. To control in the normal band in the ATWS EOP, reactor power must be < 2%. As stated, power is above this valve.					
References to be provided during exam:		None				

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Lesson Plan	2621.845.0.0053, RPV Control - with ATWS
Learning Objective/	EWA-2257, Given the EOP, describe in detail each step/statement, including the technical basis, and how to verify or perform each step.

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified:			
VISION System/Question ID		609216	
Question Source		ILT 07-1 SRO Audit Exam	
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis
	X 3:SPK		
NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			
10CRF55 Content	55.41		55.43
	5		
Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.			
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	295006	PRA:	NO
Safety Function:	1	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

2

ID: 10-1 NSRO2

Points: 1.00

The plant was at rated power when an event occurred. The Operator reports the following observations:

- BUS 1B CNTRL DC LOST has alarmed
- BUS 1D CNTRL DC LOST has alarmed
- **ALL** Isolation Condenser A valves on Panel 1F/2F indicate green light on
- Annunciator DC-E PWR XFER has **NOT** alarmed
- Annunciator DC-D PWR XFER has **NOT** alarmed

Which **ONE** of the following is the cause for the indications listed above **AND** which of the following shall the SRO direct?

NOTE:

ABN-53 is DC A and Panel Failures

ABN-54 is DC B and Panel/MCC Failures

ABN-55 is DC C and Panel/MCC Failures

- A. IAW ABN-54, direct an Operator to manually align DC-1 transfer switch to DC-A.
- B. IAW ABN-53, direct an Operator to manually align DC-E transfer switch to DC-B.
- C. IAW ABN-54, direct an Operator to manually align DC-D transfer switch to DC-A.
- D. IAW ABN-55, direct an Operator to manually operate supply and load breakers at DC-2 as required.

Answer: C

Answer Explanation

QID: 10-1 NSRO2

Question #

2

Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A	Importance Rating	
	RO	SRO

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

295004 Partial or Total Loss of DC Pwr / 6 AA2.01 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER : Cause of partial or complete loss of D.C. power				3.2	3.6
Level	SRO	Tier	1	Group	1
General References	ABN-54				
Explanation	<p>C is Correct. The plant was at rated power when DC control power was lost to Bus 1B & 1D. This DC power comes from 125 VDC Bus DC-B. Thus, there is a loss of DC-B and ABN-54 applies. The provided information also states that DC-D & DC-E did not transfer to their alternate DC supply. Of these, only DC-D is fed from DC-B. The question stem also states that the valve positions for Isolation Condenser A indicate their normal positions. Two of the valves are powered by DC-1, which is fed by DC-B. Since the indications do show valve positions, then DC-1 has transferred to its alternate DC supply (DC-A). Thus, DC-B has been lost and DC-D did not auto transfer. IAW ABN-54, manually performing the transfer of DC-D is correct.</p> <p>A is Incorrect but plausible. ABN-54 does direct manually transferring the power supply for DC-1 if it didn't auto transfer. From the indications provided, it did auto transfer.</p> <p>B is Incorrect but plausible. DC-E is normally powered from DC-A and the alternate supply is DC-B. But since DC-A has not lost power, performing actions IAW ABN-53 is not appropriate.</p> <p>D is Incorrect but plausible since the action in answer D is correct IAW ABN-55, but this ABN will not be entered under the given conditions since DC-C has not lost power.</p>				
References to be provided during exam:	None				
Lesson Plan	2621.828.0.0012, DC Distribution				
Learning Objective/	DCD-10445, Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.				

Question Source (New, Modified, Bank)	Bank
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EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

If Bank or Modified:				
VISION System/Question ID		718366		
Question Source		ILT 09-1 SRO NRC Exam		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPK
	NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			
10CRF55 Content	55.41		55.43	5
	Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	295004	PRA:	NO	
Safety Function:	6	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

3

ID: 10-1 NSRO3

Points: 1.00

The plant is at rated power. An event then occurred and control room indications now include the following:

- Annunciator ROD BLOCK is in alarm
- Annunciator ACCUM PRESS LO/LEVEL HI is in alarm
- Annunciator 24 VDC CHG TROUBLE is in alarm
- All SDV 'A' Train valve indications are extinguished
- All STABILIZER VALVES SELECT NC19 valve position indications are extinguished
- All HOTWELL LEVEL meters indicate downscale

Which **ONE** of the following is the cause for the indications listed **AND** what shall the SRO direct?

NOTE:

ABN-54 is DC B and Panel/MCC Failures

ABN-55 is DC C and Panel/MCC Failures

ABN-58 is Instrument Power Failures

The cause for the indications listed is a loss of ...

- A. VACP-1. IAW ABN-58 direct manually starting the Standby Gas Treatment System.
- B. DC-D. IAW ABN-54, direct manually aligning Auto Transfer Switch for DC-D to DC-A.
- C. IP-4A. IAW ABN-58, direct adjusting Reactor Recirculation Flow for required power changes.
- D. DC-2. IAW ABN-55 direct manually operating Isolation Condenser 'B' DC valves if required for operation.

Answer: C

Answer Explanation

QID: 10-1 NSRO3

Question #

3

Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

K&A					Importance Rating	
					RO	SRO
295003 Partial or Complete Loss of AC / 6 AA2.05 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : Whether a partial or complete loss of A.C. power has occurred					3.9	4.2
Level	SRO	Tier	1	Group	1	
General References	ABN-58					
Explanation	C is Correct. The question stem provides indications of a loss of IP-4A. IAW ABN-58, Instrument Power Failures, reactor power will be required to be manipulated using Reactor Recirculation Flow due to the Reactor Manual Control System losing power. In order to examine the K/A, the applicant must correctly diagnose a loss of an AC bus has occurred, not DC. The SRO must then direct an action required by each ABN. All distractors are Incorrect but plausible. It is RO knowledge to diagnose which bus is lost, however it is SRO Only knowledge to know what action to direct IAW the applicable ABN. A choice of two Vital AC buses and two DC buses are given as choices in order for the applican to determine whether a partial or complete loss of AC power has occurred IAW the K/A.					
References to be provided during exam:		None				
Lesson Plan	2621.828.0.0056, Vital AC Distribution					
Learning Objective/	VAC-10445, Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.					

Question Source (New, Modified, Bank)	New
If Bank or Modified: VISION System/Question ID Question Source	N/A

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPK
	NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			
10CRF55 Content	55.41		55.43	5
	Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	295003	PRA:	NO	
Safety Function:	6	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

4

ID: 10-1 NSRO4

Points: 1.00

A plant startup is in progress with the following:

- EMRV testing is in progress
- Torus average water temperature is rising

Which one of the following describes the Torus average water temperature limits during and after the test, in accordance with Technical Specifications?

Torus average water temperature shall **NOT** exceed (1) during performance of the test and must be reduced below the normal power operation limit within (2).

	(1)	(2)
A.	95°F	12 hours
B.	105°F	12 hours
C.	95°F	24 hours
D.	105°F	24 hours

Answer: D

Answer Explanation

QID: 10-1 NSRO4

Question # 4 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
295026 Suppression Pool High Water Temp./ 5 2.2.38 - Knowledge of conditions and limitations in the facility license.				3.6	4.5
Level	SRO	Tier	1	Group	1
General References	TS 3.5.A.1				

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Explanation	<p>D is Correct. IAW TS 3.5.A.1.c.(2), During testing which adds heat to the suppression pool, the water temperature shall not exceed 10F above the normal Power Operation limit (95F). In connection with such testing, the pool temperature must be reduced below the Power Operation limit within 24 hours.</p> <p>A is Incorrect. This distractor is plausible if the applicant does not recall the Max power limit value of 95F and that temperature is allowed to be 10F above that limit. In addition, 24 hrs are allowed to return pool temperature below the Power Operation limit, not 12 hrs.</p> <p>B is Incorrect. This distractor is plausible if the applicant does not recall that 24 hrs are allowed to return pool temperature below the Power Operation limit, not 12 hrs.</p> <p>C is Incorrect. This distractor is plausible if the applicant does not recall the Max power limit value of 95F and that temperature is allowed to be 10F above that limit.</p>
References to be provided during exam:	None
Lesson Plan	2621.850.0.0090, Overview/Highlights of Technical Specifications
Learning Objective/	TSX-1661, Using the Tech Specs, determine if LCO requirements are/are not being met and determine the appropriate plant/operator response and state the basis for the response.

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified:		SRO Question #80	
VISION System/Question ID		2010 NMP-1 SRO NRC Exam	
Cognitive Level	Memory or Fundamental Knowledge	X 1:P	Comprehension or Analysis
	NUREG 1021 Appendix B: Procedure steps and cautions		
10CRF55 Content	55.41		55.43
	Conditions and limitations in the facility license.		
Justification for LORT questions with K/A values < 3.0		N/A	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	295026	PRA:	NO
Safety Function:	5	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

5

ID: 10-1 NSRO5

Points: 1.00

A plant startup is in progress with all IRMs on Range 8. An event then occurred and plant indications now include the following:

- Annunciator ROD BLOCK is in alarm
- Annunciator IRM HI-HI / INOP I is in alarm
- Panel 4F IRM 12 DN SCL OR INOP white light is illuminated
- All Panel 4F RPS SCRAM SOLENIOD white lights are illuminated
- All IRM indications on Panel 4F are stable

Which **ONE** of the following actions shall the SRO direct **NEXT**?

- A. IAW ABN-39, RPS Failures, direct manually inserting a half scram on RPS I.
- B. IAW RAP-G1e, IRM HI-HI/INOP, direct bypassing IRM 12 IAW procedure 402.4, IRM Bypass Operation.
- C. IAW ABN-39, RPS Failures, direct placing the RPS I Sub Channel Test Keylocks in the TRIP position.
- D. IAW RPV Control - with ATWS EOP, following Immediate Failure to Scram Actions, direct placing both ADS Timers in BYPASS.

Answer: A

Answer Explanation

QID: 10-1 NSRO5

Question # 5 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
295037 SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown / 1 2.4.8 - Emergency Procedures / Plan: Knowledge of how abnormal operating procedures are used in conjunction with EOP's.				3.8	4.5
Level	SRO	Tier	1	Group	1

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

General References	ABN-39		
Explanation	<p>A is Correct. The question stem provides a condition where IRM 12 has failed INOP. With the Rod Block and IRM Hi-Hi/INOP alarm in, a 1/2 scram on RPS I should've been received and was not. IAW ABN-39, RPS Failures, a subsequent action in the ABN is to manually insert a 1/2 scram on RPS I.</p> <p>B is Incorrect. This distractor is plausible since this is an action the crew will perform, however conservative decision making will require the SRO to direct FIRST inserting a manual 1/2 scram on RPS I. The action to bypass IRM 12 (and continue with the plant startup) would come from plant management.</p> <p>C is Incorrect. This distractor is plausible since this is a subsequent action IAW ABN-39, however the action to insert (or attempt to insert) a manual 1/2 scram on RPS I is before placing the Sub Channel Test Keylocks in TRIP.</p> <p>D is Incorrect. This distractor is plausible since it is an action the crew would take, but only if a valid scram signal is received on both RPS systems. In this case, a valid scram signal was received on RPS system I only.</p> <p>This question examines the SRO's ability to interpret plant indications and prioritize ABN-39 over RPV Control - with ATWS EOP in this case. If actions of ABN-39 are not successful, then entry into the EOP is required.</p>		
References to be provided during exam:	None		
Lesson Plan	2621.828.0.0039, Reactor Protection System		
Learning Objective/	RPS-10450, Describe and interpret procedure sections and steps for plant emergency or off-normal conditions that involve this system including personnel allocation and equipment operation IAW applicable ABN, SDRP, EOP & EOP support procedures and EP Procedures.		

Question Source (New, Modified, Bank)	New
If Bank or Modified: VISION System/Question ID Question Source	N/A

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 2:RI
	NUREG 1021 Appendix B: Recognizing Interaction between systems (plural), including consequences and implications			
10CRF55 Content	55.41		55.43	5
	Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	295037	PRA:	NO	
Safety Function:	1	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

6

ID: 10-1 NSRO6

Points: 1.00

The plant is cooling down for a refuel outage with the following current conditions:

- RPV water level is 160" and steady
- RPV pressure is 85 psig and lowering slowly
- Shutdown Cooling Pumps A and B are in service

Which of the following annunciators/indications indicate a **TOTAL** loss of shutdown cooling flow, and what action is required?

	<u>Annunciator/Indication</u>	<u>Required Action</u>
A.	Annunciator DW PRESS HI/LO is alarming	Raise RPV water level to > 185" IAW ABN-3, Loss of Shutdown Cooling
B.	Annunciator SHUT DN CLG - ISOL VALVES OPEN clearing (NOT in alarm)	Establish an RPV alternate cooldown using the Turbine Bypass Valves IAW ABN-3, Loss of Shutdown Cooling
C.	Annunciator SD HX PUMP RM TEMP HI is alarming	Confirm SDC automatic isolation IAW the Secondary Containment Control EOP
D.	RPV pressure indication rises to 90 psig	Bypass the isolation and restore SDC IAW 305, Shutdown Cooling System Operation

Answer: B

Answer Explanation		
QID: 10-1 NSRO6		
Question #	6	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information		
K&A	Importance Rating	
	RO	SRO

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

295021 Loss of Shutdown Cooling / 4					4.1	4.3
2.4.45 - Ability to prioritize and interpret the significance of each annunciator or alarm.						
Level	SRO	Tier	1	Group	1	
General References		ABN-3				
Explanation		B is Correct. The plant is cooling down with SDC. Annunciator ISOL VALVES OPEN would be in the alarm state with SDC in service. This annunciator alarms when ever SDC V-17-19 or V-17-54 is NOT in the full closed position. When this annunciator clears, then both valves are in the full closed position. With these valves closed, all SDC flow is lost. IAW ABN-3, Loss of Shutdown Cooling, if SDC is lost, then re-establish alternate cooling IAW Attachment ABN-3-3. At 85 psig, RPV coolant temperature is about 327F, and the Attachment allows the use of the main turbine bypass valves to cooldown.				
		A is Incorrect but plausible. SDC will isolate on high DW pressure (3.0 psig). But the annunciator provided in answer A alarms at 1.4 psig and thus there is no isolation signal. The action listed in answer A is correct for a high DW pressure isolation of SDC.				
		C is Incorrect but plausible. If a primary leak were to occur in the SDC Room, then the Secondary Containment Control EOP would require isolation of the leak, which could be performed by isolating the SDC system. This would result in a total loss of SDC flow. But, the alarm provided, which does indicate a SDC leak, does not result in an automatic SDC isolation. The SDC system isolation is manual.				
		D is Incorrect but plausible. SDC will isolate if recirculation pump loop temperature reaches 350F. But at 90 psig, the temperature is only about 331F, and no automatic isolation occurs.				
References to be provided during exam:			Attachment 203-2			
Lesson Plan		2621.828.0.0045, Shutdown Cooling System				
Learning Objective/		SDC-10445, Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.				

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified:			
VISION System/Question ID		718253	
Question Source		ILT 09-1 SRO Audit Exam	
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis
			X 3:SPR
NUREG 1021 Appendix B: Solve a Problem using References			
10CRF55 Content	55.41		55.43
	5		
Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.			
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	295021	PRA:	NO
Safety Function:	4	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

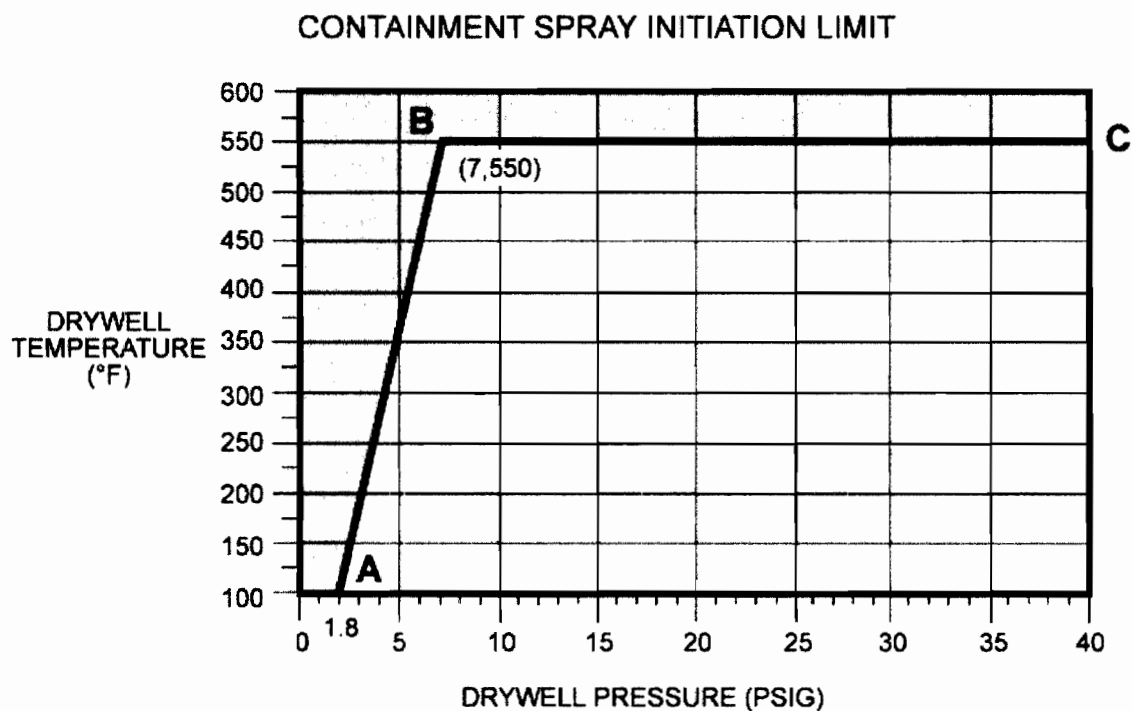
7

ID: 10-1 NSRO7

Points: 1.00

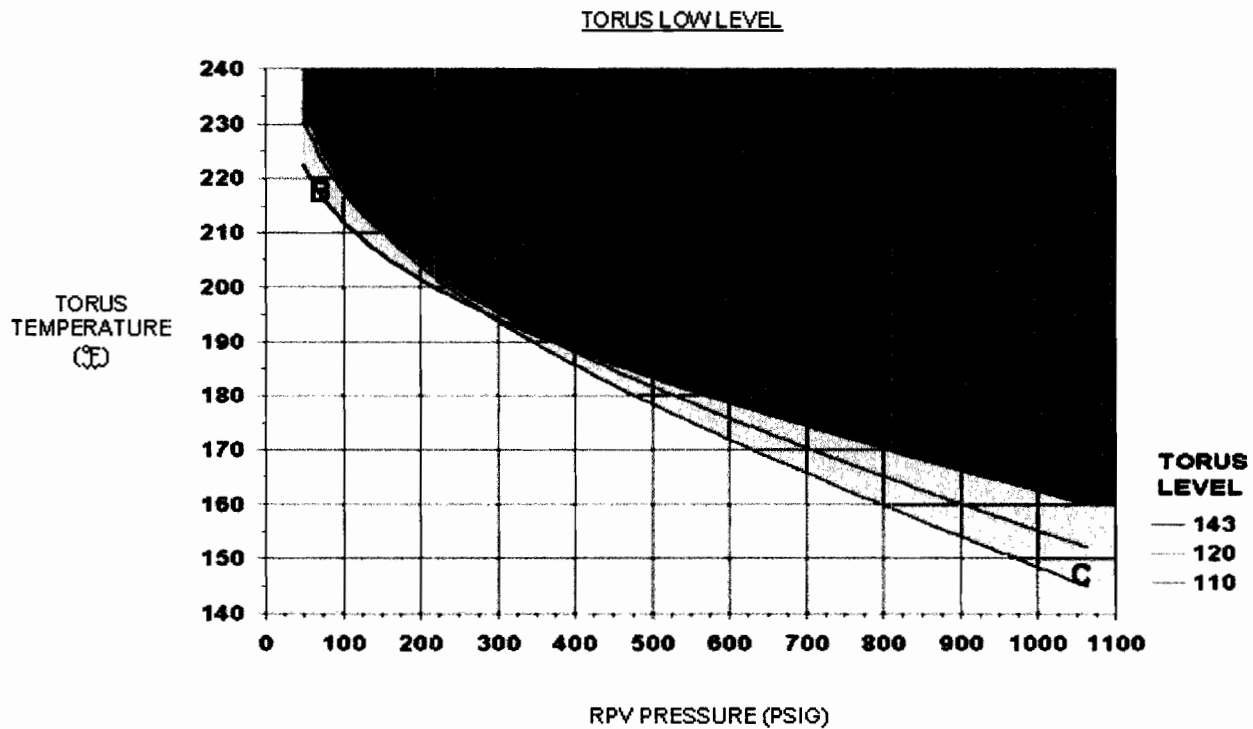
The reactor was at rated power when an event occurred. Current plant conditions are as follows:

- All control rods indicate full-in
- RPV water level lowered to 130" and has recovered to 182"
- RPV pressure is 900 psig and steady
- Drywell temperature is 225 °F and steady
- Drywell pressure is 2 psig and steady
- Torus water level is 120" and steady
- Torus water temperature is 158 °F and rising slowly



EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam



Which of the following actions shall the SRO direct?

- A. Line-up and spray the Drywell per the Primary Containment Control EOP.
- B. Emergency Depressurize the RPV per the Primary Containment Control EOP.
- C. Lower RPV pressure with Turbine Bypass valves per the RPV Control - no ATWS EOP.
- D. Lower RPV pressure with the Isolation Condensers per the RPV Control - no ATWS EOP.

Answer: C

Answer Explanation

QID: 10-1 NSRO7

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Question #	7	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
295030 Low Suppression Pool Water Level / 5 EA2.03 - Ability to determine and/or interpret the following as they apply to LOW SUPPRESSION POOL WATER LEVEL : Reactor pressure				3.7	3.9
Level	SRO	Tier	1	Group	1
General References	PCC EOP	EOP User's Guide			

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Explanation	<p>C is Correct. A loss of Drywell cooling, with controlled Drywell venting can result in the Drywell conditions listed. A Torus leak combined with EMRV leakage, with no Torus cooling can result in the Torus indications listed.</p> <p>From the conditions in the question stem, it is given that the reactor has scrammed. The plant has entered RPV Control – No ATWS EOP (RPVC-NA EOP) on low RPV water level, and Primary Containment Control EOP (PCC EOP) due to low Torus water level, high Torus water temperature, and high DW temperature.</p> <p>There are no parameters that require an emergency depressurization. Currently, the Heat Capacity Temperature Limit Curve is not violated but will be violated if RPV pressure is maintained constant and Torus temperature continues to rise. If Torus temperature and RPV water level cannot be maintained below HCTL, ED will be required. IAW the RPV Control – No ATWS EOP, if Torus temperature cannot be maintained below HCTL, then maintain RPV pressure below HCTL. This action will prevent the need to ED. Because RPV water level is > 180", the Isolation Condensers cannot be used to reduce RPV pressure. The EMRVS can be used to lower RPV pressure.</p> <p>A is Incorrect. This distractor is plausible if the applicant does not recognize that spraying the Drywell is not appropriate since Drywell is < 12 psig, and since Drywell parameters are on the bad side of the Containment Spray Initiation Limit Curve.</p> <p>B is Incorrect. This distractor is plausible if the applicant does not recognize that the HCTL is not currently violated and lowering RPV pressure can prevent the need to ED.</p> <p>D is Incorrect. This distractor is plausible if the applicant does not recognize that since RPV water is > 180", it precludes the use of the Isolation Condensers.</p>
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EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

References to be provided during exam:	None	
Lesson Plan	2621.845.0.0056, Primary Containment Control	
Learning Objective/	PCC-3000, Using EMG-3200.02, evaluate the technical basis for each step in the procedure and apply this evaluation to determine correct courses of action under emergency conditions.	

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified: VISION System/Question ID		609460		
Question Source		ILT 07-1 SRO NRC Exam		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPK
	NUREG 1021 Appendix B: <u>Solve a Problem using Knowledge and its meaning</u>			
10CRF55 Content	55.41		55.43	5
	Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes		Point Value: 1		
System ID No.:	295030	PRA:	NO	
Safety Function:	5	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

8

ID: 10-1 NSRO8

Points: 1.00

The reactor was at rated power when an event occurred, which required a manual scram. The following plant conditions exist:

- The REACTOR MODE SELECTOR switch is in SHUTDOWN
- All APRM/LPRM DNSCL lights are OFF
- RPV pressure is being maintained 800 - 1000 psig with the Isolation Condensers
- Drywell pressure indicates 2 psig and rising slowly
- Torus water temperature indicates 80° F and steady
- RPV water level indicates 140" and steady
- Drywell temperature indicates 220° F and rising slowly
- All turbine bypass valves have failed closed
- Radiation elements C3 and C6 indicate 25 Mr/hr and 16 Mr/hr, respectively, and are rising slowly
- The following Panel 10R ISO COND RM TEMPS indicate between 189° F and 202° F, and rising slowly:
 - ♦ IB-06-A, SOUTH COLUMN BY CONDENSERS ELEV. 95 FT.
 - ♦ IB-06-B, NORTH COLUMN BY CONDENSERS ELEV. 95 FT.
 - ♦ IB-06-C, CEILING BY EAST VALVES ELEV. 75 FT.
 - ♦ IB-06-D, CEILING BY WEST VALVES ELEV. 75 FT.

Which one of the following actions must be taken for these conditions?

- A. Maintain RPV water level between 138" – 175", IAW RPV Control – with ATWS.
- B. Initiate the Liquid Poison System IAW Support Procedure 22, Initiating The Liquid Poison System.
- C. Initiate one Containment Spray System in the Torus Cooling Mode IAW Primary Containment Control.
- D. Isolate the Isolation Condensers and use EMRVs for pressure control, IAW Secondary Containment Control.

Answer: D

Answer Explanation

QID: 10-1 NSRO8

Question #

8

Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information
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EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

K&A					Importance Rating	
					RO	SRO
295033 High Secondary Containment Area Radiation Levels / 9 EA2.01 - Ability to determine and/or interpret the following as they apply to HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS: Area radiation levels					3.8	3.9
Level	SRO	Tier	1	Group	2	
General References		SCC EOP		EOP User's Guide		
Explanation	D is Correct. Two indications are given that show a leak in the area of the ICs: rising temperatures and radiation levels. Both temperature and radiation levels are above the Max Normal valves in Secondary Containment Control EOP. Since it appears that one/both of the ICs are discharging into the RB, they should be isolated, and RPV pressure control should be augmented with another system, such as EMRVs. The section that directs isolating the IC's from the SCC EOP is not provided due to being a direct lookup.					
	A is Incorrect but plausible. Because reactor power is above 2% (all dn scl/inop lights off), then RPV water level should be lowered to below 30", IAW the ATWS EOP.					
	B is Incorrect but plausible. The Liquid Poison System would be required to be initiated due to power oscillations or to prevent exceeding the BIIT curve.					
	C is Incorrect but plausible. The question stems shows that an ATWS occurred and ICs are controlling RPV pressure due to the failure of the TBVs. Because torus water temperature is 80° F and steady, there is no need to initiate torus cooling. This portion of PCC is not provided since it would be a direct lookup.					
References to be provided during exam:		None				

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Lesson Plan	2621.845.0.0057, Secondary Containment Control
Learning Objective/	SCC-3082, Using Procedure 3200.11, evaluate the technical basis for each step and apply this evaluation to determine the correct course of action under emergency conditions.

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified: VISION System/Question ID		608983	
Question Source		ILT 07-1 SRO Comp #3	
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis
	X 3:SPK		
NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			
10CRF55 Content	55.41		55.43
	5		
Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.			
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	295033	PRA:	NO
Safety Function:	9	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

9

ID: 10-1 NSRO9

Points: 1.00

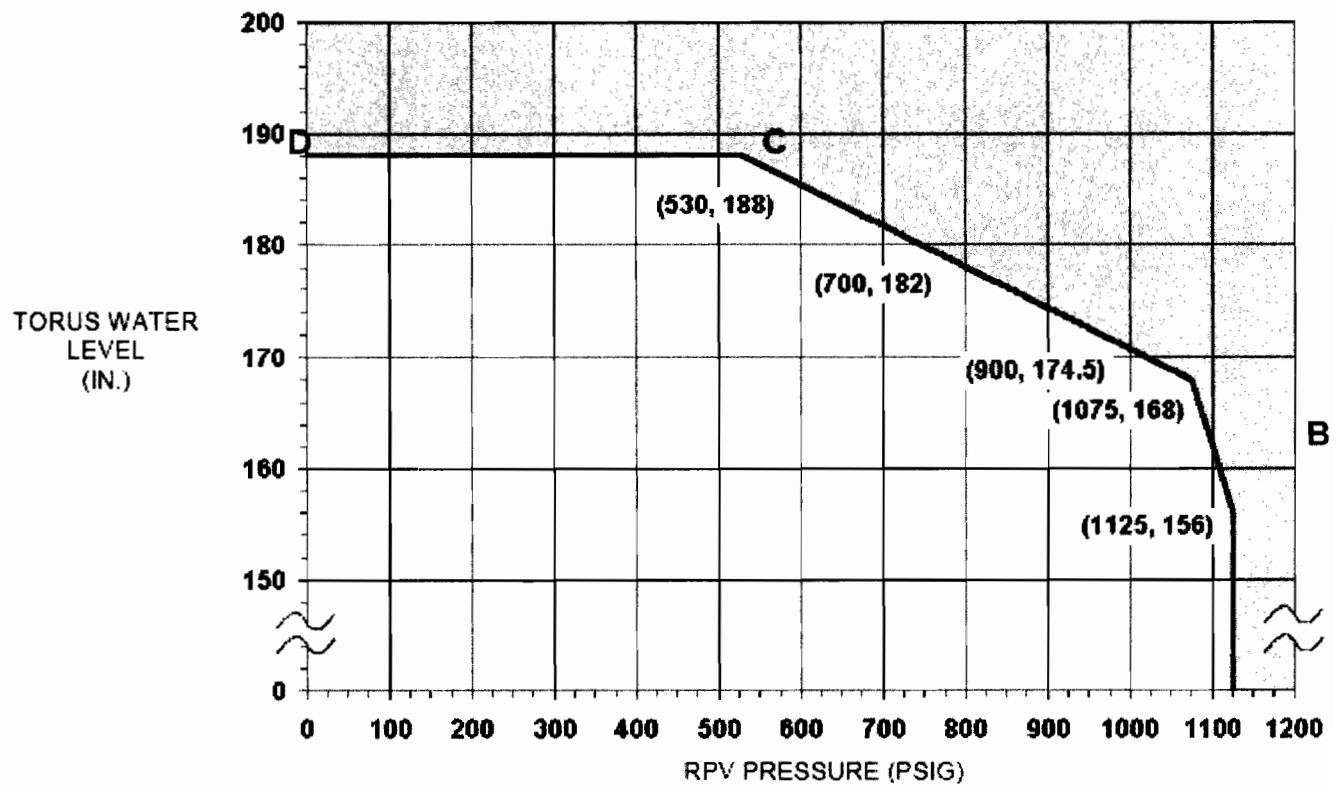
The plant is at rated power when an event occurred. The current plant conditions are as follows:

- All control rods indicate full-in
- RPV pressure is being maintained at 900 - 1000 psig
- Feedwater and SLC are maintaining RPV water level at 90" TAF
- Drywell pressure is 10 psig and rising slowly
- Torus pressure is 9 psig and rising slowly
- Torus water temperature is 135° F and rising slowly
- Torus water level is 170" and rising slowly

Refer to portions of "Primary Containment Control" below.

"Primary Containment Control"

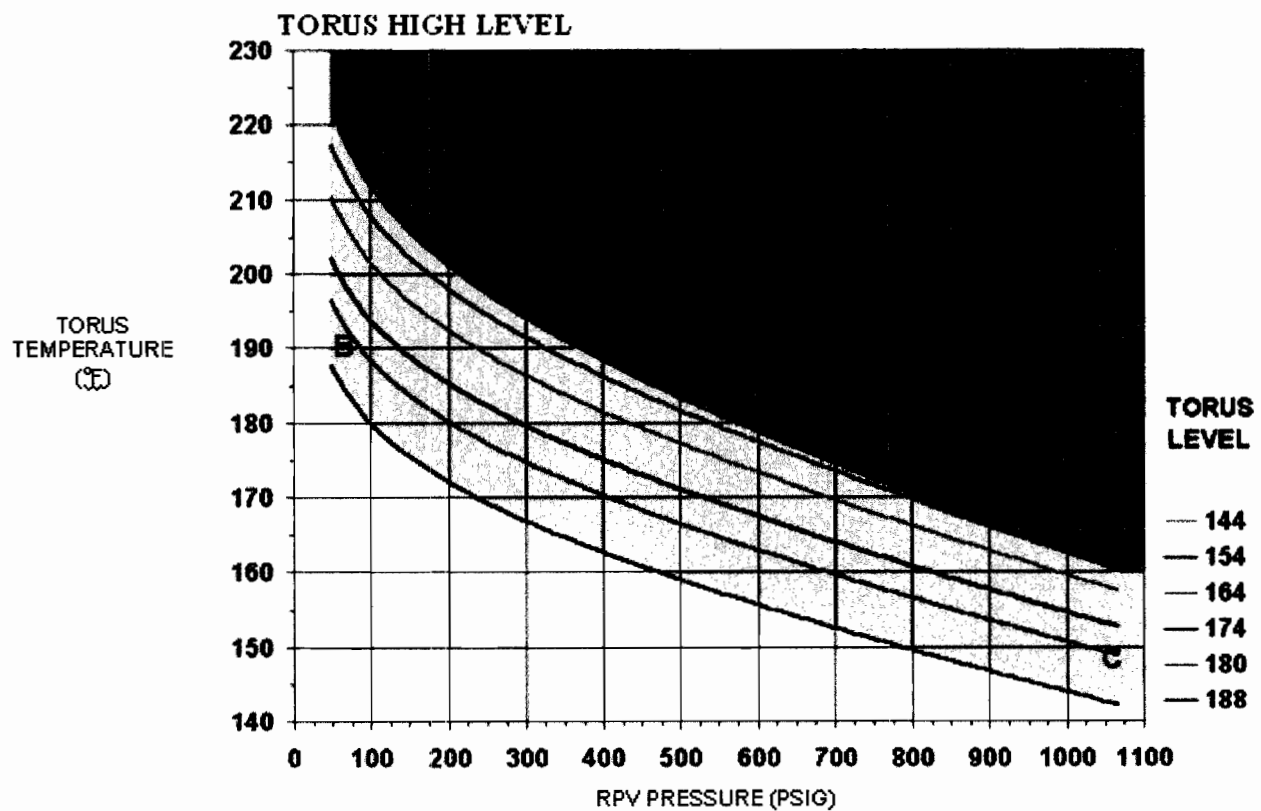
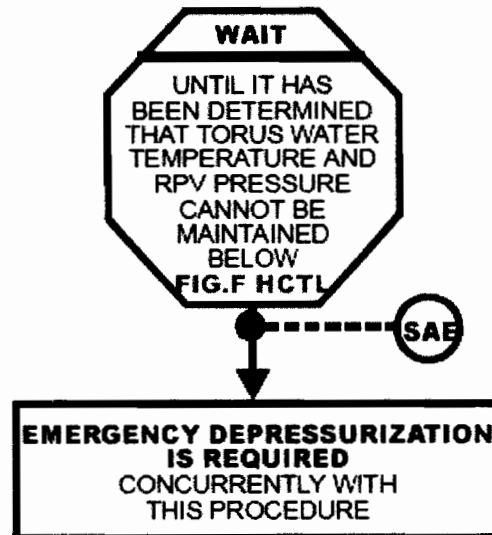
TORUS LOAD LIMIT



EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

"Primary Containment Control"



EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Which of the following is the correct action and the reason for this action?

- A. Lower RPV pressure to allow all low pressure systems to inject per RPV Control - no ATWS Level Restoration Leg.
- B. Place the ADS Timers in BYPASS to prevent an uncontrolled cooldown per RPV Control - no ATWS Level Restoration Leg.
- C. Lower RPV pressure to prevent over-stressing the EMRV quenchers in the event that an EMRV lifts per RPV Control - no ATWS Pressure Leg.
- D. Emergency Depressurize the RPV to prevent exceeding the Heat Capacity Temperature Limit on a LOCA per Primary Containment Control Torus Temperature Leg.

Answer: C

Answer Explanation		
QID: 10-1 NSRO9		
Question #	9	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
295029 High Suppression Pool Water Level / 5 2.1.32 - Conduct of Operations: Ability to explain and apply all system limits and precautions.				3.8	4.0
Level	SRO	Tier	1	Group	2
General References	RPV Control - no ATWS		EOP User's Guide		

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Explanation	<p>C is Correct. From the given conditions, the combination of RPV pressure and torus level (and slowly rising) place it very close to the torus load limit curve (PPC EOP). Since torus level is rising, the next question asked is if RPV pressure can be maintained below Torus Load Limit (TLL). Violating TLL when an EMRV opens can over-stress EMRV tailpiece and related components (quencher). So, the only correct answer is to ensure RPV pressure stays below the TLL as torus water level rises. There is also an override in RPVC - No ATWS which says that if torus level cannot be maintained below TLL, then reduce RPV pressure. The question ensures the applicant understands and applies the correct actions to maintain plant parameters below the TLL.</p>	
	<p>A is Incorrect. In the level leg of RPV Control, with level above 61", the Level Restoration portion has not been entered. When asked if level can be maintained/restored above 61", the answer is yes which bring you back to the top of the level leg. Lowering RPV pressure is in the restoration leg which has not been entered. This distractor is plausible if the applicant does not correctly interpret level conditions.</p>	
	<p>B is Incorrect. Placing the ADS Timers in bypass is in the RPV water level restoration leg, which has not even been entered yet. This distractor is plausible if the applicant does not correctly interpret level conditions.</p>	
	<p>D is Incorrect but plausible. In the torus temperature leg of PCC EOP, ED is the last step when it has been determined that torus temperature and RPV pressure cannot be maintained below HCTL. The given torus temperature is below the relevant HCTL curve, and, RPV pressure can be reduced. ED is not required now from this parameter.</p>	
References to be provided during exam:	None	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Lesson Plan	2621.845.0.0052, RPV Control - no ATWS
Learning Objective/	ENA-3055, Given a copy of RPV Control, describe in detail each step or conditional statement, including technical basis, and how to perform each step as required.

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified:			
VISION System/Question ID		510927	
Question Source		ILT 05-1 SRO Audit Exam	
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis
	X 3:SPK		
NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			
10CRF55 Content	55.41		55.43
	5		
Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.			
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	295029	PRA:	NO
Safety Function:	5	<input checked="checked" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

10

ID: 10-1 NSRO10

Points: 1.00

The plant is at 25% power when a pneumatic supply line failure to outboard MSIV NS-04B results in plant conditions including the following:

- Panel 11F NS-04B indicates GREEN light ON and RED light OFF

Which of the following describes (1) the plant impact, if any, and (2) what procedural actions must be taken by the SRO?

- A. (1) An automatic half scram on RPS 2 will occur **ONLY**.
(2) Reset the half scram IAW RAP-G1c, SCRAM CONTACTOR OPEN, when the cause is corrected and conditions permit.
- B. (1) An automatic half scram on RPS 2 will occur **ONLY**.
(2) Enter ABN-1, Reactor Scram, and restore RPV level between 138 - 160"; stabilize RPV pressure below 1045#.
- C. (1) An automatic full scram will occur.
(2) Enter ABN-1, Reactor Scram, and restore RPV level between 138 - 160"; stabilize RPV pressure below 1045#.
- D. (1) **NEITHER** a half scram or full scram will occur.
(2) Continue Power Operations IAW 202.1; direct Work Support correct pneumatic supply failure.

Answer: A

Answer Explanation

QID: 10-1 NSRO10

Question # 10 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
295020 Inadvertent Cont. Isolation / 5 & 7 2.2.44 - Equipment Control: Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives effect plant and system conditions.				4.2	4.4
Level	SRO	Tier	1	Group	2

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

General References	RAP-J2a		
Explanation	<p>A is Correct. The question stem provides a condition where the applicant must interpret that NS-04B (outboard MSIV) has failed closed. Since the reactor is at 25% power, this will only result in a half scram on RPS 2. If power was higher, the resulting RPV pressure rise would result in a full reactor scram. The SRO must then direct actions in RAP-J2a, MSIV CLOSED II, to reset the half scram once the cause of the pneumatic failure is corrected and plant conditions permit.</p> <p>B is Incorrect. This distractor is plausible if the applicant believes the reactor should be manually scrambled due to this condition.</p> <p>C is Incorrect. This distractor is plausible if the applicant believes the plant reached an automatic scram setpoint. An MSIV in both RPS systems must be < 90% open OR RPV pressure must rise above the high scram setpoint (which will not occur at the lower power in the question stem).</p> <p>D is Incorrect. This distractor is plausible if the applicant does not recall that one MSIV <90% open will result in a half scram on RPS.</p>		
References to be provided during exam:	None		
Lesson Plan	2621.828.0.0037, Reactor Protection System		
Learning Objective/	RPS-10441, Given the system logic/electrical drawings, describe the system trip signals, setpoints and expected system response including power loss or failed components.		

Question Source (New, Modified, Bank)	Modified
If Bank or Modified:	
VISION System/Question ID	N/A
Question Source	Peach Bottom Dec 2009 SRO Exam

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 2:RI
	NUREG 1021 Appendix B: Recognizing Interaction between systems (plural), including consequences and implications			
10CRF55 Content	55.41		55.43	5
	Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	295020	PRA:	NO	
Safety Function:	5 & 7	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

11

ID: 10-1 NSRO11

Points: 1.00

The plant was at rated power when an event occurred. Current conditions are as follows:

- All control rods indicate green back-light
- 4160 BUS 1B indicates 0 AC AMPERES
- RPV water level is 40" and lowering
- Feedwater is being injected into the RPV at 2.5×10^6 lb/hr IAW Support Procedure 8, Lineup for Condensate Injection
- Core Spray System 1 is lined up for injection IAW Support Procedure 9, Lineup for Core Spray System Injection
- RPV pressure is 400 psig and lowering
- Drywell pressure is 17.9 psig and rising
- The leak rate into the primary containment has been quantified at 2.9×10^6 lb/hr

Which of the following states the RPV water level control strategy the SRO shall direct **AT THIS TIME**?

- A. Lower RPV pressure as necessary to allow low pressure systems to inject into the RPV.
- B. Manually raise feedwater flow to $> 2.9 \times 10^6$ lb/hr IAW Support Procedure 8, Lineup for Condensate Injection.
- C. Line-up and commence injection with Core Spray 2 IAW Support Procedure 9, Lineup for Core Spray System Injection.
- D. Wait until RPV water level lowers to the top of active fuel, and then direct an ED to allow low pressure systems to inject into the RPV.

Answer: A

Answer Explanation

QID: 10-1 NSRO11

Question #	11	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A	Importance Rating	
	RO	SRO

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

259002 Reactor Water Level Control System A2.04 - Ability to (a) predict the impacts of the following on the REACTOR WATER LEVEL CONTROL SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: RFP runout condition: Plant-Specific				3.0	3.1
Level	SRO	Tier	2	Group	1
General References	RPV Control - no ATWS	EOP User's Guide			

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

	<p>A is Correct. The stem shows that a leak into the PC has occurred, and that FW pumps B and C are not available, due to the Bus 1B loss. RPV water level is 40" and lowering, and current RPV pressure is above all low pressure systems discharge head, and the reactor has scrammed. Because FW runout protection will cap flow through the one remaining FW pump at 2.67×10^6 lb/hr, FW flow cannot be raised to greater than the leak size (and other FW pumps are unavailable). Because DW pressure is > 2.9 psig, core spray has started and is running on minimum flow and NOT discharging into the RPV (which is at 400 psig). The EOP step should be to lower RPV pressure to allow low pressure systems (ie., core spray) to inject. This question also requires the SRO to choose the correct strategy between RPV Control - no ATWS level control and the Level Restoration contingency.</p>
Explanation	<p>B is Incorrect. This distractor is plausible if the applicant does not recognize that current RPV pressure is above all low pressure systems discharge head, and the reactor has scrammed. Because FW runout protection will cap flow through the one remaining FW pump at 2.67×10^6 lb/hr, FW flow cannot be raised to greater than the leak size (and other FW pumps are unavailable).</p> <p>C is Incorrect. This distractor is plausible if the applicant does not recognize that RPV pressure is greater than the discharge pressure of the Core Spray pumps. Injection will not be possible until RPV pressure lowers to < 310 psig.</p> <p>D is Incorrect. Because core spray has started normally, when the SRO directs a lowered RPV pressure to allow core spray to inject, THEN the SRO will decide if this action can keep water level above 0".</p>
References to be provided during exam:	None

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Lesson Plan	2621.845.0.0052, RPV Control - no ATWS
Learning Objective/	EWA-3055, Given a copy of the EOP, describe each step/statement, including the technical basis and how to verify or perform each step.

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified:		609226	
VISION System/Question ID		ILT 07-1 SRO Audit Exam	
Cognitive Level	Memory or Fundamental Knowledge		X
	Comprehension or Analysis		3:SPK
NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			
10CRF55 Content	55.41		55.43
	5		
Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.			
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	259002	PRA:	NO
Safety Function:	2	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

12


ID: 10-1 NSRO12

Points: 1.00

The plant was at rated power with activities being performed in the Spent Fuel Pool, when an event occurred on the refuel floor. The following conditions have existed for 5 minutes:

- **ALL** refuel floor radiation monitors indicate between 70 and 90 mR/hr
- REACTOR BUILDING VENT MANIFOLD NO.1 and NO. 2 radiation monitors indicate 3 - 4 mR/hr
- RX BLDG DIFFERENTIAL PRESS indicates -0.25 inches of water
- **NO** operator actions have taken place

Which of the following states the **CURRENT** status of the Reactor Building Ventilation System (RBVS) **AND** Standby Gas Treatment System (SGTS), **AND** the **FUTURE** status of the RBVS and SGTS **AFTER** the appropriate override (provided below) has been directed and performed by the crew?

IF	THEN
Rx BLDG VENTILATION EXHAUST RADIATION LEVEL IS X MR/HR ABOVE	CONFIRM SECONDARY CONTAINMENT INITIATIONS AND ISOLATIONS PER SUPPORTPROC-49
1. Rx BLDG VENTILATION ISOLATES OR IS SHUTDOWN AND 2. DRYWELL IS NOT BEING VENTED THROUGH THE Rx BLDG SUPPLY FANS AND 3. Rx BLDG VENTILATION EXHAUST RADIATION LEVEL IS BELOW X MR/HR OR Rx BLDG PRESSURE IS ABOVE 0 IN. OF WATER AND A GROUND LEVEL RELEASE IS IMMINENT OR IN PROGRESS	OPERATE AVAILABLE Rx BLDG VENTILATION PER SUPPORTPROC-50 

Current Status

Future Status

- | | | |
|----|--|--|
| A. | RBVS is operating
SGTS is in standby | RBVS is operating
SGTS is in standby |
| B. | RBVS is operating
SGTS is in standby | RBVS is shutdown
SGTS is operating |
| C. | RBVS is shutdown/isolated
SGTS is operating | RBVS is operating
SGTS is shutdown |
| D. | RBVS is shutdown/isolated
SGTS is operating | RBVS is shutdown/isolated
SGTS is operating |

Answer: C

Answer Explanation

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

QID: 10-1 NSRO12		
Question #	12	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
261000 SGTS A2.15 - Ability to (a) predict the impacts of the following on the STANDBY GAS TREATMENT SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High area radiation by refuel bridge: Plant-Specific				3.0	3.4
Level	SRO	Tier	2	Group	1
General References	EOP User's Guide	SCC EOP			

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Explanation	<p>C is Correct. The question stem describes an event that occurred on the refuel floor. Floor area radiation monitors are alarming. Radiation monitors C9 and B9, when their setpoint is exceeded, will start a 2-minute timer. At the end of 2 minutes, RBVS will trip and isolate and SGT will auto start.</p> <p>As provided in an override in Secondary Containment Control EOP: 1) if RB ventilation isolates or is shutdown (which it has); AND 2) Drywell is not being vented through the RB supply fans (which it isn't); AND 3) RB vent exhaust radiation levels are below 9 mr/hr (which they are) OR RB pressure is above 0" of water and a ground release is imminent or in-progress (which it isn't), THEN operate available RB ventilation IAW SP-50.</p> <p>The question stem provides enough information to recognize that RBVS has tripped/isolated and SGTS has started. When SP-50, Reactor Building Ventilation Restart, is performed, this will stop SGTS and re-start RBVS.</p> <p>The SRO must direct the correct override, either SP-50 or SP-49, in order to obtain the correct answer. The actual setpoint values in each override have been changed to an "X" to eliminate a direct lookup.</p>	
	<p>A is Incorrect. This distractor is plausible if the applicant believes the SRO should direct SP-50 but the RBVS has NOT tripped yet.</p>	
	<p>B is Incorrect. This distractor is plausible if the applicant does not recognize that refuel floor radiation levels have exceeded the point where RBVS has tripped and SGTS has started. In addition, this is plausible if the SRO believes they should direct SP-49 be performed instead of SP-50. In this case, the Future Status will have the SGTS operating and RBVS will be secured.</p>	
	<p>D is Incorrect. This is plausible if the SRO believes they should direct SP-49 be performed instead of SP-50. In this case, the Future Status will have the SGTS operating and RBVS will be secured.</p>	
References to be provided during exam:	None	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Lesson Plan	2621.845.0.0057, Secondary Containment Control
Learning Objective/	SCC-3082, Using procedure 3200.11, evaluate the technical basis for each step and apply this evaluation to determine the correct course of action under emergency conditions.

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified:			
VISION System/Question ID		666199	
Question Source		ILT 08-1 SRO Audit Exam	
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis
	X 3:SPK		
NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			
10CRF55 Content	55.41		55.43
	5		
Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.			
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	261000	PRA:	NO
Safety Function:	9	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

13

ID: 10-1 NSRO13

Points: 1.00

The plant was at rated power when a LOCA occurred. Plant conditions include the following:

- One control rod indicates at position 48; all other control rods indicate GREEN backlight
- RPV Pressure indicates 890 psig and lowering
- RPV Water Level indicates 58" and lowering
- Drywell Pressure indicates 8 psig and rising
- Drywell Temperature indicates 190°F and rising
- Torus Pressure indicates 7 psig and rising
- Torus Temperature indicates 190°F and rising
- Containment Oxygen indicates 3% on both H₂/O₂ monitors

For the above conditions, which **ONE** of the following must the SRO direct **NEXT**?

Assume **ALL** Immediate Actions required by OP-OC-101-111-1001, Strategies For Successful Transient Mitigation, have been performed by the crew.

- A. Bypass ADS Timers IAW RPV Control - Level Restoration
- B. Trip all Recirculation Pumps IAW RPV Control - with ATWS - Power Leg
- C. Line-up AND Initiate Drywell Sprays IAW Primary Containment Control - Pressure Leg
- D. Exit all EOPs and enter SAMGs IAW Primary Containment Control - Combustable Gas Leg

Answer: A

Answer Explanation		
QID: 10-1 NSRO13		
Question #	13	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information		
K&A	Importance Rating	
	RO	SRO

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

218000 ADS 2.4.9 - Emergency Procedures / Plan: Knowledge of low power / shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.					3.8	4.2
Level	SRO	Tier	2	Group	1	
General References	RPV Control - Level Restoration		EOP User's Guide			
Explanation	<p>A is Correct. The question stem provides a condition where a LOCA occurred and the plant is now shutdown. IAW the EOP User's Guide, the reactor can be considered shutdown under all conditions without boron if all rods, except one, are full in. Since RPV water level is 58" and lowering, RPV Control - Level Restoration (entry at 61") has been entered. The first action the SRO must direct to the crew is to Bypass ADS Timers.</p> <p>B is Incorrect but plausible. If the applicant believes the crew is taking actions IAW RPV Control - with ATWS, the next action the SRO would direct would be to trip all recirculation pumps from the Power Leg (or bypass ADS Timers in the Level/Power Leg which is not given as a choice). Tripping recirc pumps is the next action since the stem states that all Immediate Actions per the Transient Mitigation document has been completed by the crew. This would not be required anyway since all recirc pumps would have tripped on RPV Lo-Lo level <86".</p> <p>C is Incorrect but plausible. It is true the the direction to Lineup Drywell Sprays IAW PCC could be ordered, however the order to initiate sprays must wait until Drywell or Torus Pressure is > 12 psig.</p> <p>D is Incorrect but plausible. This would be the correct action if Containment Hydrogen was > 2.5%. The stem states that Containment Oxygen is 3%. The H2/O2 analyzer monitors and the crew will record both values when determining Containment Combustable Gas levels.</p>					
References to be provided during exam:		None				

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Lesson Plan	2621.845.0.0052, RPV Control - no ATWS
Learning Objective/	ENA-3055, Given a copy of RPV Control, describe in detail each step or conditional statement, including technical basis, and how to perform each step as required.

Question Source (New, Modified, Bank)		New	
If Bank or Modified: VISION System/Question ID Question Source		N/A	
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis
	X 3:SPK		
NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			
10CRF55 Content	55.41		55.43
	5		
Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.			
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	218000	PRA:	NO
Safety Function:	3	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

14

ID: 10-1 NSRO14

Points: 1.00

The reactor was at rated power when an event occurred. Plant conditions include the following:

- Annunciator SCRAM CONTACTOR OPEN is in alarm
- All red scram lights are ON
- Annunciator ARI INITIATED is in alarm
- RPV water level indicates 120" TAF and rising slowly
- Drywell pressure is 2.2 psig and rising very slowly
- Drywell temperature is 170 °F and rising very slowly
- Torus water temperature is 100 °F and rising
- All reactor Recirculation Pumps DRIVE MOTOR switches are green-flagged (switch semaphore indicates green)
- Annunciators EMRV OPEN and SV/EMRV NOT CLOSED are in alarm
- Annunciator APRM DNSCL is **NOT** in alarm
- Annunciator ROPS BYPASSED is in alarm

For the above conditions, which **ONE** of the following shall the SRO direct **NEXT**?

- A. Close the MSIVs IAW ABN-40, Stuck Open EMRV
- B. Initiate drywell sprays IAW Primary Containment Control
- C. Vent the scram air header IAW RPV Control - with ATWS
- D. Perform scram reset and scram IAW RPV Control - with ATWS

Answer: D

Answer Explanation		
QID: 10-1 NSRO14		
Question #	14	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
215005 APRM / LPRM 2.4.46 - Emergency Procedures / Plan: Ability to verify that the alarms are consistent with the plant conditions.				4.2	4.2
Level	SRO	Tier	2	Group	1

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

General References	RPV Control - with ATWS	EOP User's Guide	
Explanation	<p>D is Correct. The indications provided show that an electromatic relief valve (EMRV) is open (EMRV open and not closed alarms) and that a reactor scrammed occurred (scram contactor open alarm and scram lights on). It also shows that the reactor is not shutdown and that power is greater than 4% (APRM downscale alarm not in-applicant verifies this is consistent with other plant conditions), and alternate rod insertion (ARI initiated alarm) has been initiated. The initial conditions show that reactor overfill protection (ROPS) is bypassed and that all reactor recirculation pumps have been manually tripped (green-flagged switches). The next action in RPV Control - With ATWS is to insert control rods given a hydraulic ATWS exists (since all red scram lights are on, then all scram valves have opened and the ATWS is not electric). A possible method to insert control rods is to reset the scram, allow the scram discharge volume time to drain, and to scram again.</p>		
	<p>A is Incorrect but plausible. This is an action in ABN-40 to close MSIVs to limit cooldown, however MSIVs should never be closed during an ATWS (unless directed by EOPs) due to removing the largest heat sink available. This action is also directed following a successful manual scram, which has not occurred.</p>		
	<p>B is Incorrect but plausible. Even though drywell sprays could be initiated now in the drywell temperature leg, temperature is far away from 281F, and other actions are of higher priority and would not be the NEXT action.</p>		
	<p>C is Incorrect but plausible if the applicant does not recognize that a hydraulic ATWS exists, not an electric ATWS. This is a correct action for the SRO to direct if an electric ATWS was present.</p>		
References to be provided during exam:	None		

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Lesson Plan	2621.845.0.0053, RPV Control - with ATWS
Learning Objective/	EWA-10445, Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.

Question Source (New, Modified, Bank)		Modified	
If Bank or Modified:			
VISION System/Question ID		510960	
Question Source		ILT 05-1 SRO NRC Exam	
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis
	X 3:SPK		
NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			
10CRF55 Content	55.41		55.43
	5		
Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.			
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	215005	PRA:	NO
Safety Function:	7	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

15

ID: 10-1 NSRO15

Points: 1.00

A plant startup is in progress with the following conditions:

- RPV pressure is 700 psig and rising slowly
- RPV water level is in the normal band
- Control rods are being withdrawn
- Feedwater Pump A is in service

An event then occurred. Plant conditions now include the following:

- Annunciator RPS MG SET 1 TRIP came into alarm
- RPV water level swelled to 181" and is slowly rising

Based on the above conditions, which of the following RPV pressure control strategies shall the SRO direct?

- A. Use EMRVs IAW RPV Control - no ATWS
- B. Adjust the MPR setpoint IAW 201, Plant Startup
- C. Use the Isolation Condensers IAW RPV Control - no ATWS
- D. Use the Bypass Valve Opening Jack IAW 201, Plant Startup

Answer: A

Answer Explanation

QID: 10-1 NSRO15		
Question #	15	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information		
K&A	Importance Rating	
	RO	SRO
212000 RPS A2.01 - Ability to (a) predict the impacts of the following on the REACTOR PROTECTION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: RPS motor-generator set failure	3.7	3.9

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Level	SRO	Tier	2	Group	1
General References	RPV Control - no AWTs	237E566 Sh. 3	EOP User's Guide		
Explanation	<p>A is Correct. Under the conditions in the stem, with RPV pressure less than 825 psig (TS value), a single RPS Bus loss will result in a full reactor scram and closure of the MSIVs. With the closure of the MSIVs, changing the MPR setpoint or the Bypass Valve Opening Jack will have no impact on RPV pressure. The EMRVs can be still used to control RPV pressure. Even though the use of EMRVs require Torus water level above 90", the event started at normal level of approximately 150" and can be assumed to be the same.</p> <p>B and D are Incorrect but plausible if the applicant does not recall that MSIVs will go closed on a loss of a single RPS bus with RPV pressure < 825 psig.</p> <p>C is Incorrect. This distractor is plausible if the applicant does not recognize that the Isolation Condensers are not available due to RPV level > 160". IC DC valves are also isolated at 180".</p>				
References to be provided during exam:	None				
Lesson Plan	2621.828.0.0037, Reactor Protection System				
Learning Objective/	RPS-10445, Given a set of system indications or data, evaluate and interpret them to determine limits, trends, and system status.				

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified: VISION System/Question ID Question Source		609465 ILT 07-1 SRO NRC Exam		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPK
	NUREG 1021 Appendix B: <u>Solve a Problem</u> using Knowledge and its meaning			
10CRF55 Content	55.41		55.43	5
	Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.			

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Justification for LORT questions with K/A values < 3.0	N/A		
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	212000	PRA:	NO
Safety Function:	7	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

16

ID: 10-1 NSRO16

Points: 1.00

The plant is at 70% power. An event then occurred resulting in the following indications:

- Annunciator HOTWELL CONDUCT HI is in alarm
- Annunciator RX WATER COND HI is in alarm
- Conductivity recorder CR-423-11, Point 1, A NORTH HOTWELL, indicates hotwell conductivity of 1.1 $\mu\text{mho/cm}$ and steady
- Conductivity recorder IJ10 indicates REACTOR WATER conductivity of 1.0 $\mu\text{mho/cm}$ and steady
- Reactor coolant chloride concentration is 0.21 ppm as confirm by Chemistry Department

Which of the following states the required action and the Technical Specifications bases on chloride ion concentration?

	<u>Action</u>	<u>Chloride TS Bases</u>
A.	Raise reactor power to raise the steaming rate	To minimize chloride induced pitting corrosion of reactor internals
B.	Immediately initiate an orderly shutdown	To minimize stress corrosion cracking of stainless steel components
C.	Backwash the A North condenser section	To minimize stress corrosion cracking of stainless steel components
D.	Immediately isolate the A North hotwell by closing the CW inlet/outlet valves	To minimize chloride enhanced zirconium cracking

Answer: C

Answer Explanation

QID: 10-1 NSRO16

Question #	16	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A	Importance Rating
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EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

					RO	SRO
256000 Reactor Condensate A2.15 - Ability to (a) predict the impacts of the following on the REACTOR CONDENSATE SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Abnormal water quality					2.8	3.3
Level	SRO	Tier	2	Group	2	
General References	TS 3.3.E		RAP-K7a			
Explanation	C is Correct. The question describes a high conductivity event introduced in the A North hotwell and its effect on reactor water chlorides. IAW the TS bases, limits on chlorides is to prevent stress corrosion cracking of stainless steel components. RAP-K7a (HOTWELL CONDUCT HI) directs a backwash if hotwell conductivity is > 1 µmho/cm. A and D are Incorrect but plausible since they list the incorrect bases. The applicant may not recall the correct action to take either. B is Incorrect but plausible. The TS allows the unit to remain at power for 72 hours when chlorides exceed 0.2 ppm (but < 0.5 ppm) and if conductivity exceeds 1 µmho/cm (but < 10 µmho/cm). TS does not require an immediate S/D at the given chloride rate or conductivity.					
References to be provided during exam:		None				
Lesson Plan	2621.828.0.0017, Feed and Condensate System					
Learning Objective/	CFW-10445, Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.					

Question Source (New, Modified, Bank)	Bank
If Bank or Modified: VISION System/Question ID Question Source	609232 ILT 07-1 SRO Audit Exam

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPK
	NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			
10CRF55 Content	55.41		55.43	2
	Facility operating limitations in the technical specifications and their bases.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	256000	PRA:	NO	
Safety Function:	2	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

17

ID: 10-1 NSRO17

Points: 1.00

The plant is at rated power with the following conditions:

- Three (3) control rods are inoperable at 00 and valved out of service
- One (1) control rod is inoperable at 04 and valved out of service
- One (1) control rod is inoperable at 02 and valved out of service
- One (1) control rod is inoperable at 48 and valved out of service
- Reactor Engineering has determined adequate Shutdown Margin is available for continued operation

A fault then occurs in the Reactor Manual Control System resulting in another control rod being declared INOPERABLE.

Complete the following sentence regarding whether continued plant operation is allowed and the bases for that decision IAW Technical Specifications:

Continued plant operation is...

- A. **NOT** allowed. The plant must be placed in the shutdown condition since this could be indicative of a generic problem.
- B. allowed. The reactor may remain in operation provided that **ONLY** the three (3) rods **NOT** at position 00 are defined as INOPERABLE.
- C. allowed. The reactor may remain in operation provided that this new INOPERABLE control rod is **NOT** at position 48 **AND** adequate Shutdown Margin can be demonstrated.
- D. **NOT** allowed. The plant must be placed in the shutdown condition since under any circumstance, the reactor **CANNOT** demonstrate adequate Shutdown Margin under this condition.

Answer: A

Answer Explanation		
QID: 10-1 NSRO17		
Question #	17	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information		
K&A	Importance Rating	
	RO	SRO

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

201002 RMCS						3.4	4.7
2.2.40 – Ability to apply Technical Specifications for a system.							
Level	SRO	Tier	2	Group	2		
General References		TS 3.2.B.4					
Explanation		A is Correct. IAW Tech Spec 3.2.B.4, in no case shall the number of inoperable control rods valved out of service be greater than six during the power operation. If this specification is not met, the reactor shall be placed in the shutdown condition. The bases states the number of inoperable control rods permitted to be valved out of service could be many more than six allowed by the specification, particularly late in the operating cycle; however, the occurrence of more than six could be indicative of a generic problem and the reactor will be shut down. All distractors are Incorrect but plausible if the applicant does not recall the Tech Spec action requirement or correct bases for the action.					
References to be provided during exam:			None				
Lesson Plan Learning Objective/		2621.850.0.0050, Overview/Highlights of Technical Specifications TSX-1920, Given various plant indications (and their values) or copies of control room/plant logs, evaluate the indications to determine plant status with respect to operating license and technical specifications.					

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified: VISION System/Question ID Question Source		507130 ILT Bank #378		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPK
	NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			
10CRF55 Content	55.41		55.43	2
	Facility operating limitations in the technical specifications and their bases.			

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Justification for LORT questions with K/A values < 3.0	N/A		
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	201002	PRA:	NO
Safety Function:	1	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

18

ID: 10-1 NSRO18

Points: 1.00

Following core power distribution checks, the # 3 TIP Ball Valve did **NOT** automatically close due to a malfunctioning in-shield limit switch.

What action is required?

Restore the inoperable TIP Ball Valve to operable status within (1) hours or (2) .

- A. (1) 4
(2) actuate the respective TIP Shear Valve
- B. (1) 4
(2) de-energize the affected TIP Ball Valve in the closed position
- C. (1) 48
(2) de-energize the affected TIP Ball Valve in the closed position
- D. (1) 48
(2) the reactor shall be placed in the Cold Shutdown condition within 24 hours

Answer: C

Answer Explanation

QID: 10-1 NSRO18

Question #	18	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
215001 Traversing In-core Probe 2.1.32 – Ability to explain and apply system limits and precautions.				3.8	4.0
Level	SRO	Tier	2	Group	2
General References	405.2	TS 3.5.A.3			

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Explanation	C is Correct. In order to maintain Primary Containment Integrity (which is required during core power distribution checks...reactor critical, etc.), and with an inoperable TIP ball valve (automatic containment isolation valve), Tech Spec 3.5.A.3 requires: maintaining an operable isolation valve in the affected penetration (the shear valve meets this requirement), and within 48 hours (TIP) either restore the inoperable TIP ball valve, or isolate the penetration by use of a deactivated automatic isolation valve secured in the isolated position, or by use of a closed manual valve. The way to deactivate the TIP Ball Valve is to de-energize it.	
	A & B are Incorrect due to the time allowed. This distractor is plausible if the applicant does not recall the correct time the TIP must be returned to operable status.	
	D is Incorrect. This distractor is plausible since if these provisions cannot be met, the reactor shall be placed in COLD SHUTDOWN within 24 hours.	
References to be provided during exam:	None	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Lesson Plan	2621.828.0.0029, Nuclear Instrumentation
Learning Objective/	<p>NIS-10451, Referencing plant Technical Specifications (* from memory for Initial Candidates) and given a set of plant conditions, determine, as applicable, the:</p> <ul style="list-style-type: none"> a) Definitions* b) Safety Limits and Bases* c) Limiting Safety System Settings and Bases* d) Limiting Conditions for Operation and Applicability e) LCO Action Requirements (SRO ONLY) f) Surveillance Requirements (SRO ONLY) g) Design Features, Containment, Auxiliary Equipment, Administrative Controls, and Appendix B Environmental Technical Specifications (SRO ONLY) h) Bases for Surveillance Requirements, Design Features, Containment, Auxiliary Equipment, Administrative Controls, and Appendix B Environmental Technical Specifications. (SRO ONLY)*

Question Source (New, Modified, Bank)		Bank	
If Bank or Modified:			
VISION System/Question ID		506190 / NI-05	
Question Source		ILT Bank	
Cognitive Level	Memory or Fundamental Knowledge	X 1:P	Comprehension or Analysis
	NUREG 1021 Appendix B: Procedure steps and cautions		
10CRF55 Content	55.41		55.43
	2		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	215001	PRA:	NO
Safety Function:	7	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

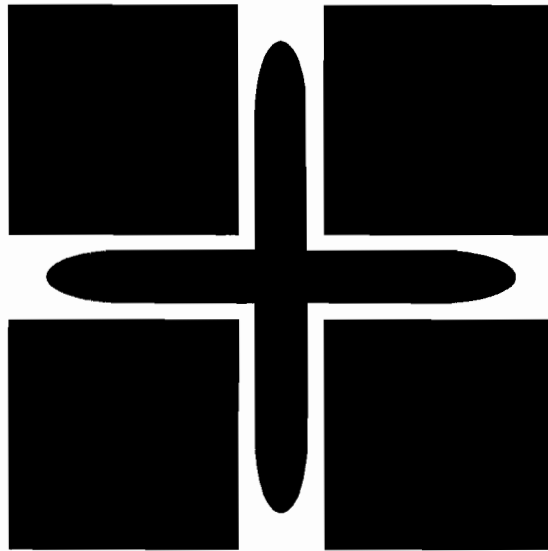
ILT 10-1 NRC SRO Exam

19

ID: 10-1 NSRO19

Points: 1.00

The plant is shutdown for a refuel outage. Control rod 30-35 is to be replaced. Which of the following lists, in the correct order, the steps to prepare the cell to remove the control rod from the core?



- A.
 - 1. Remove fuel bundles A and B
 - 2. Insert double blade guide
 - 3. Remove fuel bundles C and D
 - 4. Uncouple control rod
 - 5. Withdraw control rod to position 48
- B.
 - 1. Remove fuel bundles A and C
 - 2. Insert double blade guide
 - 3. Remove fuel bundles B and D
 - 4. Withdraw control rod to position 48
 - 5. Uncouple control rod
- C.
 - 1. Remove fuel bundles A and B
 - 2. Remove fuel bundles C and D
 - 3. Insert double blade guide
 - 4. Uncouple control rod
 - 5. Withdraw control rod to position 48
- D.
 - 1. Remove fuel bundles A and insert single blade guide
 - 2. Remove fuel bundles B and insert single blade guide
 - 3. Remove fuel bundles C and insert single blade guide
 - 4. Remove fuel bundles D and insert single blade guide
 - 5. Withdraw control rod to position 48
 - 6. Uncouple control rod

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Answer: B

Answer Explanation

QID: 10-1 NSRO19

Question # 19 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
2.1.36 - Knowledge of procedures and limitations involved in core alterations.				3.0	4.1
Level	SRO	Tier	3	Category	COO
General References	205.0		205.5		
Explanation	<p>B is Correct. Procedures 205.0 (Reactor Refueling) and 205.5 (Rod Withdrawal/Insertion During Refueling) provide the general guidance to remove a control rod from the core: 1. remove 2 opposite bundles; 2. insert blade guide; 3. remove last 2 bundles; 4 withdraw rod to 48; 5. Uncouple.</p> <p>All distractors are Incorrect but plausible if the applicant is not familiar with the control rod removal process during refuel activities.</p>				
References to be provided during exam:	None				
Lesson Plan	2621.812.0.0003, Reactor Refueling				
Learning Objective/	RFL-7442, Describe, in general, refueling and fuel handling procedures to include precautions and limitations per Procedure 205 series.				

Question Source (New, Modified, Bank)			Bank		
If Bank or Modified: VISION System/Question ID		609011			
Question Source		ILT 07-1 SRO Comp #3			
Cognitive Level	Memory or Fundamental Knowledge	X 1:P	Comprehension or Analysis		
	NUREG 1021 Appendix B: Procedure steps and cautions				

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

10CRF55 Content	55.41		55.43	7
	Fuel handling facilities and procedures.			
Justification for LORT questions with K/A values < 3.0	N/A			
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	N/A	PRA:	NO	
Safety Function:	N/A	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

20

ID: 10-1 NSRO20

Points: 1.00

The Control Room has been evacuated due to a Control Room fire. ABN-30, Control Room Evacuation, is being executed. The following conditions exist:

- The REACTOR MODE SELECTOR switch is in SHUTDOWN and all control rods verified full-in
- RPV water level is steady at 150" and adequate core cooling is assured
- RPV pressure is 900 psig and lowering
- The control room has been evacuated
- All Core Spray Pumps and all EMRV's have been disabled IAW ABN-30

Based on the conditions given, which of the following actions must be met, and bases, to comply with Technical Specifications?

1. Reduce RPV pressure to < 110 psig within 24 hours.
2. Place the reactor in COLD SHUTDOWN within 30 hours.

	<u>Action</u>	<u>Bases</u>
A.	1 ONLY	ADS requirements NOT met
B.	2 ONLY	Core Spray requirements NOT met
C.	1 and 2	ADS and Core Spray requirements NOT met
D.	NEITHER 1 or 2	All ADS and Core Spray requirements are met

Answer: C

Answer Explanation

QID: 10-1 NSRO20

Question #	20	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A	Importance Rating	
	RO	SRO

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

2.2.22 - Knowledge of limiting conditions for operations and safety limits.					4.0	4.7
Level	SRO	Tier	3	Category	EQC	
General References	TS 3.4.A.2					
Explanation	<p>C is Correct. Both Tech Spec action statements must be met...with the EMRV's disabled (IAW Attachment ABN-30-8) the ADS function is also disabled. Tech Spec 3.4.B (ADS) requires reactor pressure to be reduced to less than 110 psig within 24 hours if ADS operability requirements are <u>not</u> met. Table 3.4.1 (Core Spray) allows reduced Core Spray capability, provided several things are met: one is that the RPV be maintained < 212° F (currently at 900 psig). Since the requirements of the Table cannot be met, then 3.4.A.2 applies: place in Cold Shutdown within 30 hours.</p> <p>All distractors are Incorrect but plausible if the applicant does not recall the Tech Spec LCO or Bases for ADS disabled.</p>					
References to be provided during exam:		None				
Lesson Plan	2621.830.0.0018, Equipment Control - Admin					
Learning Objective/	2.2.22, Knowledge of limiting conditions for operations and safety limits.					

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified: VISION System/Question ID Question Source		608914 ILT 07-1 SRO Comp #2		
Cognitive Level	Memory or Fundamental Knowledge	X 1:B	Comprehension or Analysis	
	NUREG 1021 Appendix B: Bases or purpose			
10CRF55 Content	55.41		55.43	2
	Facility operating limitations in the technical specifications and their bases.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

System ID No.:	N/A	PRA:	NO
Safety Function:	N/A	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

21

ID: 10-1 NSRO21

Points: 1.00

The plant was at rated power when an event occurred.

20 minutes later, the following plant conditions exist:

- Main Steam Line radiation Monitors indicate 500 mr/hr and rising slowly
- Offgas Radiation Monitors have risen and continue to rise
- Several Turbine Building AND Reactor Building Area Radiation Monitors are in alarm (but on-scale)
- Turbine Building ΔP is positive
- All control rods indicate full-in
- The Shift Manager has declared An Alert due to Radiological Effluent

Which of the following actions is required?

- A. Close the MSIVs IAW the Radioactivity Release Control EOP
- B. Close the MSIVs IAW ABN-26, High Main Steam/Offgas/Stack Effluent Activity
- C. Emergency Depressurize the RPV IAW the Radioactivity Release Control EOP
- D. Emergency Depressurize the RPV IAW the Secondary Containment Control EOP

Answer: A

Answer Explanation

QID: 10-1 NSRO21

Question #	21	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
2.3.11 - Ability to control radiation releases.				3.8	4.3
Level	SRO	Tier	3	Category	RPT
General References	RR EOP		EOP User's Guide		

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Explanation	<p>A is Correct. The question states that an event had occurred. The conditions show that MSL and offgas radiation has increased, TB ARMs are in alarm and that TB ΔP is positive. These indicate a primary steam leak in the TB. The stem also shows that an alert emergency condition has been declared due to radiological effluents. This is an entry condition into the Radioactivity release Control EOP. The first step is to isolate primary systems discharging outside the primary and secondary containments. Closing the MSIVs would stop the leak into the TB.</p> <p>B is Incorrect but plausible since ABN-26 requires closing the MSIVs when MSL radiation is > 800 mr/hr and the stem shows only 500 and rising slowly.</p> <p>C is Incorrect but plausible since the Radioactivity Release Control EOP does require ED, but only after a GE is declared.</p> <p>D is Incorrect but plausible since ED is also required in the Secondary Containment Control EOP, but the MAX SAFE must first be exceeded (with a primary leak in the RB) in 2 areas first.</p>
References to be provided during exam:	ABN-26
Lesson Plan	2621.830.0.0015, Radiation Control - Admin
Learning Objective/	2.3.11, Ability to control radiation releases

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified: VISION System/Question ID Question Source		667779 ILT 08-1 SRO Audit Exam		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPR
	NUREG 1021 Appendix B: <u>Solve a Problem</u> using <u>References</u>			
10CRF55 Content	55.41		55.43	4
	Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.			

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Justification for LORT questions with K/A values < 3.0	N/A		
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	N/A	PRA:	NO
Safety Function:	N/A	<input checked="checked" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

22

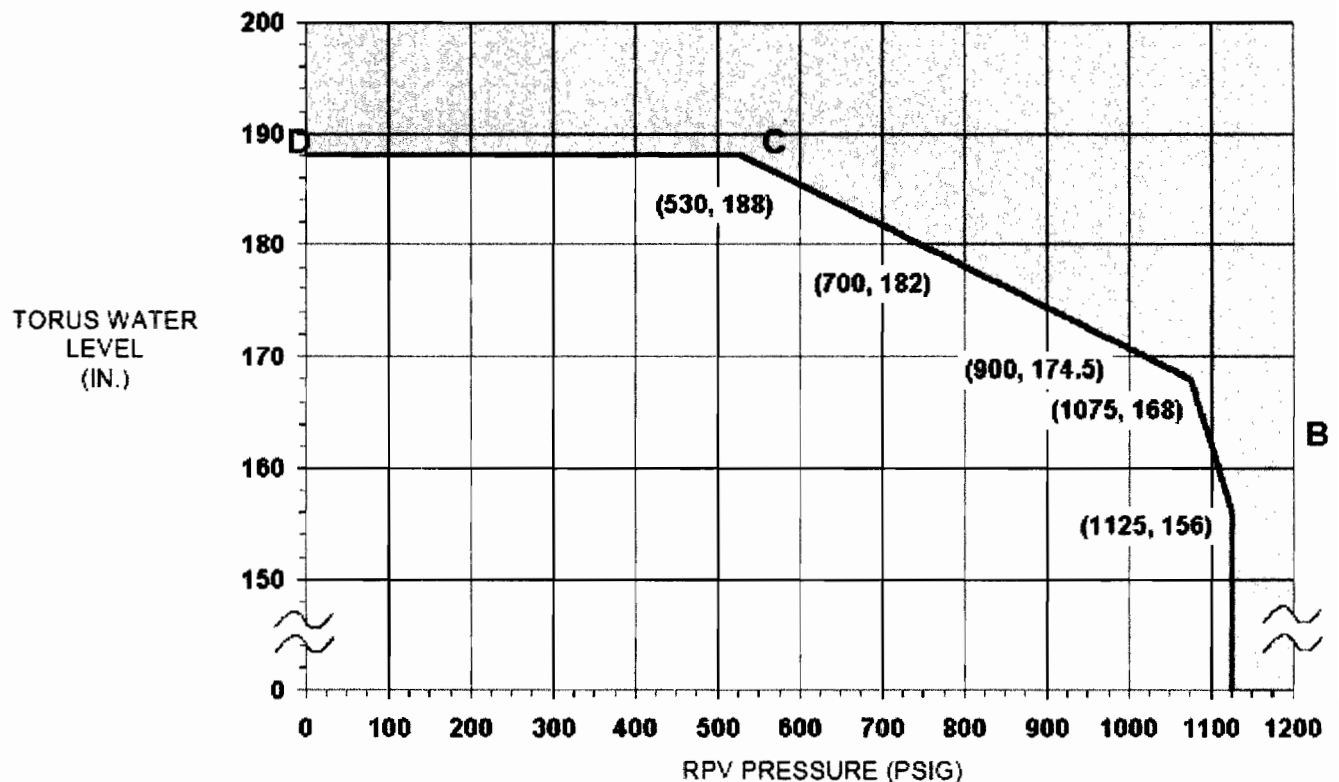
ID: 10-1 NSRO22

Points: 1.00

The reactor was at rated power when a LOCA occurred. Plant conditions include the following:

- Reactor has been scrammed and all rods at "00"
- RPV pressure is 159 psig and lowering due to the leak
- RPV water level was just raised to 60" TAF, and rising slowly
- 1 Condensate Pump is still injecting
- Core Spray injection has been terminated
- Torus water level is 184" and rising

TORUS LOAD LIMIT



EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Which of the following EOP actions is required?

- A. Emergency Depressurize per the RPV Control and Emergency Depressurization – no ATWS EOPs.
- B. Terminate RPV injection with Condensate and inject with Core Spray per the Primary Containment Control EOP.
- C. Lower RPV pressure with the Turbine Bypass Valves (exceeding 100° F/hr is allowed) per the RPV Control - no ATWS EOP.
- D. Anticipate Emergency Depressurization and rapidly reduce RPV pressure by opening the Turbine Bypass Valves per the RPV Control - no ATWS EOP.

Answer: B

Answer Explanation		
QID: 10-1 NSRO22		
Question #	22	Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
2.4.6 - Knowledge of EOP mitigation strategies.				3.6	4.7
Level	SRO	Tier	3	Category	EOP
General References	PCC EOP	EOP User's Guide			

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Explanation	B is Correct. Under the given conditions, condensate is injecting and out through the break into the torus. Torus water is currently below the Torus Load Limit. The only action which will prevent exceeding TLL and the necessity of ED, is to stop condensate (an outside containment injection source) and start core spray. Since only 1 condensate pump is currently running, 2 core spray pumps can pump more than this and will be more than able to ensure adequate core cooling.		
	A & D are Incorrect but plausible. ED is not required until it has been determined that the TLL cannot be maintained. Also, since there is some action that can be done to prevent exceeding TLL and ED, then anticipating ED is not correct.		
	C is Incorrect but plausible since lowering RPV pressure in distractor D is from a conditional statement in RPV Control will do nothing since the TLL curve is flat at the current RPV pressure and below.		
References to be provided during exam:		None	
Lesson Plan	2621.830.0.0016, Emergency Procedures/Plan - Admin		
Learning Objective/	2.4.6, Knowledge of EOP mitigation strategies.		

Question Source (New, Modified, Bank)		Bank		
If Bank or Modified: VISION System/Question ID Question Source		608431 ILT 07-1 SRO Comp #2		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPK
	NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			
10CRF55 Content	55.41		55.43	5
	Administrative, normal, abnormal, and emergency operating procedures for the facility.			
Justification for LORT questions with K/A values < 3.0		N/A		

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	N/A	PRA:	NO
Safety Function:	N/A	<input checked="checked" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

23

ID: 10-1 NSRO23

Points: 1.00

Which of the following refuel activities **REQUIRES** a Licensed SRO to **DIRECTLY** supervise?

1. Withdrawal of fuel from the vessel.
2. Control rod removal from the reactor core.
3. Insertion of fuel into the vessel.
4. Withdrawal of a fuel support piece from an empty cell.
5. Insertion of spent fuel into a Fuel Pool rack.

- A. 2 **ONLY**
- B. 1 and 3 **ONLY**
- C. 1, 2 and 3 **ONLY**
- D. 1, 2, 3, 4 and 5

Answer: C

Answer Explanation

QID: 10-1 NSRO23

Question #	23	Developer / Date: JJR / 7-11-11
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Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
2.1.37 - Knowledge of procedures, guidelines, or limitations associated with reactivity management.				4.3	4.6
Level	SRO	Tier	3	Category	COO
General References	TS 1.21 TS 6.2.2.2.e	205.0		OP-AA-300-1520	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Explanation	C is Correct. TS definition 1.21 provides the following definition for core alteration: A core alteration is the addition, removal, relocation or other manual movement of fuel or controls in the reactor core. Control rod movement with the control rod drive hydraulic system is not defined as a core alteration.		
	TS 6.2.2.2.e provides the following: All CORE ALTERATIONS shall be directly supervised by either a licensed Senior Reactor Operator or Senior Reactor Operator Limited to Fuel Handling who has no other concurrent responsibilities during this operation.		
	OP-AA-300-1520, Reactivity Management - Fuel Handling, Storage, and Refueling, requires the core alterations be performed IAW approved procedures.		
	All distractors are Incorrect but plausible since they are all activities a Licensed SRO would likely supervise, however Answer B is the only choice where a Licensed SRO is REQUIRED to supervise.		
References to be provided during exam:		None	
Lesson Plan	2621.830.0.0017, Conduct of Operations - Admin		
Learning Objective/	2.1.37, Knowledge of procedures, guidelines, or limitations associated with reactivity management.		

Question Source (New, Modified, Bank)		Modified	
If Bank or Modified: VISION System/Question ID Question Source		667775 ILT 08-1 SRO Audit Exam	
Cognitive Level	Memory or Fundamental Knowledge	X 1:P	Comprehension or Analysis
	NUREG 1021 Appendix B: Procedure steps and cautions		
10CRF55 Content	55.41		55.43 6
	Procedures and limitations involved in initial core loading, alterations in core configuration, control rod programming, and determination of various internal and external effects on core reactivity.		

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Justification for LORT questions with K/A values < 3.0	N/A		
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	N/A	PRA:	NO
Safety Function:	N/A	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

24

ID: 10-1 NSRO24

Points: 1.00

Given the following:

- A Site Area Emergency has been declared at Oyster Creek
- The Technical Support Center (TSC) and Emergency Operations Facility (EOF) are activated with command and control functions transferred accordingly

A worker is required to enter the Reactor Building under emergency conditions to close a manual valve to terminate a radioactive release. Details of this entry are as follows:

- The worker's current annual exposure is 150 mRem
- The general area radiation levels at the valve is 25 Rem/hr
- It will take 20 min for the worker to close the manual valve
- **NEGLECT** any dose the worker will receive transiting to and from the valve

According to EP-AA-113 "Personnel Protective Actions", who must authorize the emergency exposure the worker is expected to receive?

- A. The Oyster Creek Site Vice President
- B. The Shift Manager in the Control Room
- C. The Station Emergency Director in the TSC
- D. The Corporate Emergency Director in the EOF

Answer: C

Answer Explanation

QID: 10-1 NSRO24

Question # 24 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
2.3.4 - Knowledge of radiation exposure limits under normal or emergency conditions.				3.2	3.7
Level	SRO	Tier	3	Category	RPT
General References	EP-AA-113	RP-AA-203			

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Explanation	<p>C is Correct. Per EP-AA-1007 (among others), emergency exposure controls are non-delegable responsibilities that remain with the Station Emergency Director. Since the TSC is activated, the Shift Manager (Shift Emergency Director) has transferred this responsibility to the Station Emergency Director. Per EP-AA-113, the Station Emergency Director (TSC) authorizes emergency exposures greater than 5 Rem TEDE. The dose the worker will receive is 8.3 Rem ($25\text{R/hr} \times 20\text{min} = 8.3\text{ R}$). The applicant must recognize this above the limit the Site Vice President is authorized to approve and the Emergency Director with current command and control must authorize this exposure.</p> <p>A is Incorrect but plausible since the Site Vice President approves all exposure up to the Federal Limit.</p> <p>B is Incorrect but plausible since the Shift Manager is the person who authorizes emergency exposure when the Control Room has ERO command and control.</p> <p>D is Incorrect. This distractor is plausible if the applicant does not recall that emergency exposure is a non-delegable responsibility and will be authorized by either the Station ED or Shift Manager depending who has command and control on site.</p>
References to be provided during exam:	None
Lesson Plan	2621.830.0.0015, Radiation Control - Admin
Learning Objective/	2.3.4, Knowledge of radiation exposure limits under normal or emergency conditions.

Question Source (New, Modified, Bank)	Modified
If Bank or Modified: VISION System/Question ID Question Source	N/A Peach Bottom 2009 SRO NRC Exam

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Cognitive Level	Memory or Fundamental Knowledge	X 1:P	Comprehension or Analysis	
	NUREG 1021 Appendix B: Procedure steps and cautions			
10CRF55 Content	55.41		55.43	4
	Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.			
Justification for LORT questions with K/A values < 3.0		N/A		
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	N/A	PRA:	NO	
Safety Function:	N/A	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT		

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

25

ID: 10-1 NSRO25

Points: 1.00

Which one of the following activities requires a Temporary Configuration Change (TCC) per CC-AA-112, Temporary Configuration Changes?

- A. Installation and removal of a jumper in accordance with an approved surveillance test procedure.
- B. Changing a Control Room alarm setpoint that is **NOT** in direct support of a Maintenance Work Order.
- C. Installation and removal of Measurement and Test Equipment (M&TE) in accordance with an approved surveillance test procedure.
- D. A temporary configuration change included with an Operations Clearance that does **NOT** affect the system beyond the clearance boundary.

Answer: B

Answer Explanation

QID: 10-1 NSRO25

Question # 25 Developer / Date: JJR / 7-11-11

Knowledge and Ability Reference Information

K&A				Importance Rating	
				RO	SRO
2.2.11 - Knowledge of the process for controlling temporary design changes.				2.3	3.3
Level	SRO	Tier	3	Category	EQC
General References	CC-AA-112				
Explanation	<p>B is Correct. IAW the reference, temporary setpoint changes (ie. alarm setpoint changes) is not an excluded activity and therefore requires a Temporary Configuration Change (TCC), unless it is part of an approved Work Order or approved Clearance</p> <p>All distractors are Incorrect but plausible if the applicant does not recall activities that require TCCs per the procedure.</p>				
References to be provided during exam:	None				

EXAMINATION ANSWER KEY

ILT 10-1 NRC SRO Exam

Lesson Plan	2621.830.0.0018, Equipment Control - Admin
Learning Objective/	2.2.11, Knowledge of the process for controlling temporary design changes.

Question Source (New, Modified, Bank)		New	
If Bank or Modified: VISION System/Question ID Question Source		N/A	
Cognitive Level	Memory or Fundamental Knowledge	X 1:P	Comprehension or Analysis
	NUREG 1021 Appendix B: Procedure steps and cautions		
10CRF55 Content	55.41		55.43 3
	Facility licensee procedures required to obtain authority for design and operating changes in the facility.		
Justification for LORT questions with K/A values < 3.0		N/A	
Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	N/A	PRA:	NO
Safety Function:	N/A	<input checked="" type="checkbox"/> Initial License Level <input type="checkbox"/> LORT	