EXAMINATION ANSWER KEY

OC RO NRC Exam

1 **ID: 11-1 NRO 01** **Points: 1.00**

The plant is at rated power. An event then occurred and the following annunciator came into alarm:

- FCS/RFCS - DUAL LINK FAILURE

Which **ONE** of the following describes the effect on the Digital Feedwater Control System (DFCS) **AND** RPV Water Level?

DFCS __(1)__.
RPV Water Level __(2)__.

A. **(1)** transfers to the Moore Stations
(2) drops until operator action is taken

B. **(1)** does **NOT** transfer to the Moore Stations
(2) drops until operator action is taken

C. **(1)** transfers to the Moore Stations
(2) remains constant since DFCS functions to maintain last known setpoint

D. **(1)** does **NOT** transfer to the Moore Stations
(2) remains constant since DFCS functions to maintain last known setpoint

Answer: D

Answer Explanation

QID: 11-1 NRO 01		
Question #	**1**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information		
K&A	**Importance Rating**	
	RO	**SRO**
259002 Reactor Water Level Control K1.03 - Knowledge of the physical connections and/or cause- effect relationships between REACTOR WATER LEVEL CONTROL SYSTEM and the following: Reactor water level	**3.8**	**3.9**

EXAMINATION ANSWER KEY

OC RO NRC Exam

Level	RO	Tier	2	Group	1
General References	RAP-J2c, J1c				
Explanation	D is Correct. A Dual Link failure alarm informs the control room operators that the Moore Stations are disabled and the DCCs continue to function normally based on the last settings obtained from the Moore stations. As a result, the FRV's will continue to maintain RPV water level at the same setpoint so there is no impact on level. A is Incorrect but plausible. Moore stations are disabled upon a dual link failure. This would be the expected condition for a dual computer failure. Level will remain the same. B is Incorrect but plausible since it is the correct DCFS response, but incorrect RPV water level response. D is Incorrect but plausible since it is the incorrect DFCS response, but correct RPV water level response.				
References to be provided during exam:	None				
Lesson Plan	2621.828.0.0018, Feedwater Control System				
Learning Objective/	FWC-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
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:	 505981 ILT Bank No

EXAMINATION ANSWER KEY

OC RO NRC Exam

Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:PEO
	NUREG 1021 Appendix B: Predict an Event or Outcome			
10CRF55 Content	55.41b	7	55.43b	
	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.:	295002	PRA:	No	
Safety Function:	2	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC RO NRC Exam

2 **ID: 11-1 NRO 02** **Points: 1.00**

The plant is in cold shutdown and is cooling down with Shutdown Cooling. The following conditions currently exist:

- Shutdown cooling Loops A and B are in service
- RBCCW Pump 1-1 is in service
- A, B, C, and E Reactor Recirculation Loops are idle; Reactor Recirculation Pump D is operating

Which of the following will result in the **GREATEST** impact (after 3 minutes) on reactor coolant cooldown rate, with **NO** Operator action?

A. A loss of Unit Substation 1A2 due to overload.

B. SDC Pump B sensed suction temperature rises to 360 °F.

C. An 86/S1A lockout occurs due to the trip of the differential relay 87SA.

D. A loss of Drywell cooling which results in a Drywell pressure of 2.6 psig.

Answer: A

Answer Explanation

QID: 11-1 NRO 02		
Question #	**2**	**Developer / Date: JJR / 5-14-2012**

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**

EXAMINATION ANSWER KEY

OC RO NRC Exam

General References	**ABN-45**		
Explanation	**Answer A is Correct. A loss of Unit Substation1A2 results in the loss of SDC Pump A and RBCCW Pump 1-1. SDC Pump B remains in service but there is no RBCCW flow since there is no auto start signal for the RBCCW Pump 1-2.** **Answer B is Incorrect but plausible. When SDC Loop B senses 360°F, then SDC Pump B ONLY trips. SDC Pump A and RBCCW remain in service.** **Answer C is Incorrect but plausible. A lockout on Startup transformer SA results in the loss of 4160 VAC Bus 1A and 480 VAC Bus 1A2 (which looses RBCCW Pump 1-1 and SDC Pump A). But, EGD1 will fast start and load onto 4160 VAC Bus 1C and 480 VAC Bus 1A2 will re-energize and pickup RBCCW Pump 1-1 after 166 seconds. Since SDC Pump B is still running and RBCCW restored, SDC cooling remains, although diminished.** **Answer D is Incorrect but plausible. A LOCA signal (90" RPV water level AND Hi DW pressure of 2.9 psig) <u>combined</u> with LOOP will auto trip RBCCW and will not allow the auto re-start. There are no indications of a LOOP. Also, 90" RPV water level OR 2.9 psig DW pressure will isolate SDC. The values provided do not incur a SDC isolation.**		
References to be provided during exam:	**None**		
Lesson Plan	**2621.828.0.0045 Shutdown Cooling System**		
Learning Objective/	**205-10446 Identify and explain system operating controls/indications under all plant operating conditions.**		

Question Source (New, Modified, Bank)			**Bank**	
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:		**811697 ILT Bank No**		
Cognitive Level	**Memory or Fundamental Knowledge**		**Comprehension or Analysis**	**X 3:PEO**

EXAMINATION ANSWER KEY

OC RO NRC Exam

	NUREG 1021 Appendix B: Predict an Event or Outcome			
10CRF55 Content	**55.41b**	**7**	**55.43b**	
	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.:	**205000**	**PRA:**	**No**	
Safety Function:	**4**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

3 **ID: 11-1 NRO 03** **Points: 1.00**

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

- S1A SUDDN PRESS
- LKOUT RELAY 86/S1A TRIP

Which of the following states **ALL** power supplies that can provide power to the listed Bus, if the main generator tripped **AND** with **NO** Operator action?

	Bus 1C	**Bus 1D**
A.	EDG 1 CT	EDG 2 Bank 6 CT
B.	EDG 1 **ONLY**	EDG 2 Bank 6 **ONLY**
C.	EDG 1 **ONLY**	EDG 2 Bank 6 CT
D.	EDG 1 CT	Bank 6 CT **ONLY**

Answer: B

Answer Explanation

QID: 11-1 NRO 03		
Question #	**3**	**Developer / Date: JJR / 5-14-2012**

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

EXAMINATION ANSWER KEY

OC RO NRC Exam

262001 AC Electrical Distribution K2.01 - Knowledge of electrical power supplies to the following: Off-site sources of power				3.3	3.6
Level	RO	Tier	2	Group	1
General References	RAP-S1b, S4b	ABN-37	BR 3000		
Explanation	B is Correct. The listed alarms describe a loss of offsite power (transformer S1A or Bank 5) to Bus 1A which feeds Bus 1C. The remaining power supplies to Bus 1C are EDG 1 only. Power supplies available to power Bus 1D, with NO operator action are startup transformer (or Bank 6), and EDG 2. The Combustion Turbines are always available to supply Bus 1B (and feed Bus 1D) but manual Operator actions are required (ABN-37). Thus, EDG 1 to Bus 1C and EDG 2 and Bank 6 to Bus 1D are ready and available for power, with no operator actions. All distractors are Incorrect but plausible if the applicant does not recall the correct power supplies during emergency conditions with no operator actions.				
References to be provided during exam:	None				
Lesson Plan	2621.828.0.0016, Electrical Distribution				
Learning Objective/	ACD-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)	Bank
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:	 609063 ILT Bank No

EXAMINATION ANSWER KEY

OC RO NRC Exam

Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 2:DR
	NUREG 1021 Appendix B: Describing or recognizing Relationships			
10CRF55 Content	55.41b	7	55.43b	
	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.:	262001	PRA:	No	
Safety Function:	6	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC RO NRC Exam

4 **ID: 11-1 NRO 04** **Points: 1.00**

A reactor startup is in progress. Reactor power is 3% when the following annunciator goes into alarm:

- 24 VDC PP - B PWR LOST

Which one of the following conditions will result from this event?

A. Inability to insert/withdraw IRM detectors.

B. Loss of IRM/APRM recorders on Panel 4F.

C. A half-scram due to a downscale failure of IRM detectors 15-18.

D. A half-scram due to an inoperative failure of IRM detectors 15-18.

Answer: D

Answer Explanation		
QID: 11-1 NRO 04		
Question #	**4**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
215003 IRM K2.01 - Knowledge of electrical power supplies to the following: IRM channels/detectors				**2.5**	**2.7**
Level	**RO**	**Tier**	**2**	**Group**	**1**
General References	**RAP-9XF8d**	**401.2**		**ABN-58**	

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**D is Correct. A loss of 24 VDC Panel B results in an INOP condition on IRMs 15-18 (due to a loss of high voltage) when the Mode Switch is in STARTUP or REFUEL. The indication for IRM instruments 15-18 on Panel 4F also fail downscale. Based on the conditions given (reactor power is 3%), the Mode Switch would be in STARTUP.** **A is Incorrect but plausible since the IRM detector drive motors are powered from 120 VAC Panel IP-4.** **B is Incorrect but plausible since the IRM/APRM recorders on 4F are powered from 120 VAC Panel CIP-3.** **C is Incorrect but plausible since IRMs 15-18 fail downscale; the loss of power causes an INOP trip and half-scram when the Mode Switch is in STARTUP or REFUEL.**
References to be provided during exam:	**None**
Lesson Plan	**2621.828.0.0029, Nuclear Instrumentation**
Learning Objective/	**NIS-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)			**Bank**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**510728** **ILT Bank** **No**		
Cognitive Level	**Memory or Fundamental Knowledge**		**Comprehension or Analysis**	**X** **3:PEO**
	NUREG 1021 Appendix B: Predict an Event or Outcome			
10CRF55 Content	**55.41b**	**7**	**55.43b**	
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			

EXAMINATION ANSWER KEY

OC RO NRC 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.:	**215003**	**PRA:**	**No**
Safety Function:	**7**	☒ **Initial License Level** ☐ **LORT**	

EXAMINATION ANSWER KEY

OC RO NRC Exam

5 **ID: 11-1 NRO 05** **Points: 1.00**

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

- RPS MG SET 1 TRIP

Which of the following states the impact on indicated power?

A. APRMs 1-4 indicate 100%; APRMs 5-8 indicate 0%

B. APRMs 1-4 indicate 0%; APRMs 5-8 indicate 100%

C. APRMs 1, 3, 5, 7 indicate 0%; APRMs 2, 4, 6, 8 indicate 100%

D. APRMs 1, 3, 5, 7 indicate 100%; APRMs 2, 4, 6, 8 indicate 0%

Answer: B

Answer Explanation		
QID: 11-1 NRO 05		
Question #	**5**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
212000 RPS K3.03 - Knowledge of the effect that a loss or malfunction of the REACTOR PROTECTION SYSTEM will have on following: Average power range monitoring system: Plant-Specific				**3.5**	**3.6**
Level	**RO**	**Tier**	**2**	**Group**	**1**
General References	**RAP-9XF3a**				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	B is Correct. The annunciator provided shows a loss of RPS MG Set 1. This failure results in the loss of APRMs 1-4, which will indicate 0% power. APRMs 5-8 will continue to indicate normal. All other distractors are Incorrect but plausible if the candidate does know how the power supplies are arranged in the APRMs.
References to be provided during exam:	None
Lesson Plan	2621.828.0.0029, Nuclear Instrumentation
Learning Objective/	NIS-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)			Bank	
If Bank or Modified VISION System/Question ID: Question Source: Previous 2 Exams:	663329 ILT 08-1 NRC Exam No			
Cognitive Level	Memory or Fundamental Knowledge	X 1:I	Comprehension or Analysis	
	NUREG 1021 Appendix B: Interlocks, setpoints, or system (singular) response			
10CRF55 Content	55.41b	7	55.43b	
	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	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC RO NRC Exam

6 **ID: 11-1 NRO 06** **Points: 1.00**

The plant was at rated power when an Electric ATWS occurred. SP-16, Bypassing MSIV Lo-Lo level Isolation Interlocks And The RBCCW Interlocks, has been executed by the crew.

With the above conditions, if a complete loss of Instrument Air were to occur, which of the following MSIVs, if any, would lose their **CURRENT** pneumatic supply?

A. Inboard **ONLY**

B. Outboard **ONLY**

C. **BOTH** the inboard **AND** outboard

D. **NEITHER** the inboard **NOR** outboard

Answer: B

Answer Explanation		
QID: 11-1 NRO 06		
Question #	**6**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
300000 Instrument Air K3.01 - Knowledge of the effect that a loss or malfunction of the (INSTRUMENT AIR SYSTEM) will have on the following: Containment air system				**2.7**	**2.9**
Level	**RO**	**Tier**	**2**	**Group**	**1**
General References	**EMG-SP16**	**ABN-35**			

Explanation	**B is Correct. The normal pneumatic supply to the Containment (Drywell) air system at power is Nitrogen. The normal air supply to the outboard MSIVs is Instrument Air and inboard MSIVs is Nitrogen. If an event occurred where Nitrogen supply to the Drywell was lost, the Nitrogen supply would isolate automatically and Instrument Air would supply Drywell (Containment) Air system loads. If a non-ATWS complete loss of Instrument Air were to occur, however, both the inboard and outboard MSIVs would close due to V-6-395, MSIV Isolation Signal Bypass Valve, closing, securing Nitrogen to the Drywell loads too. Since SP-16 was performed, MSIV EOP interlocks have been bypassed, V-6-395 was placed in Bypass, and during a complete loss of Instrument Air, the MSIVs would still have Nitrogen Supply to them, and will remain open.** **All distractors are Incorrect but plausible if the applicant does not recall the effects of completing SP-16 on the Drywell Air System or recall the interrelationship and interlocks between Instrument and Drywell Air.**
References to be provided during exam:	**None**
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)			**New**	
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:		**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

OC RO NRC Exam

10CRF55 Content	**55.41b**	**7**	**55.43b**	
	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.:	**300000**	**PRA:**	**No**	
Safety Function:	**8**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

7 **ID: 11-1 NRO 07** **Points: 1.00**

The plant is shutdown.

Which of the following shows the correct auto-start condition for the associated plant system pump? (Note: LOOP is Loss of Offsite Power; LOCA is Loss of Coolant Accident)

A. ESW: LOOP

B. TBCCW: Low system pressure

C. Service Water: Combined LOOP **AND** LOCA

D. RBCCW: Combined Low system pressure **AND** LOOP

Answer: B

Answer Explanation		
QID: 11-1 NRO 07		
Question #	**7**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
400000 Component Cooling Water K4.01 - Knowledge of CCWS design feature(s) and or interlocks which provide for the following: Automatic start of standby pump				**3.4**	**3.9**
Level	**RO**	**Tier**	**2**	**Group**	**1**
General References	**RAP-Q5f, Q1f**				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	B is Correct. TBCCW will auto start on low system pressure (79 psig w/ 10 second time delay). TBCCW pumps trip on a LOOP and are not restored when EDGs start and load. A is Incorrect but plausible. The applicant may not recall the ESW pumps have no auto start feature associated with the LOOP. C is Incorrect but plausible since Service water will auto start from a LOOP, but not from a combined LOOP + LOCA. D is Incorrect but plausible. RBCCW has no auto start from system parameters but does auto start from a LOOP.
References to be provided during exam:	None
Lesson Plan	2621.828.0.0048, TBCCW
Learning Objective/	TBC-10443: Given the system logic/electrical drawings describe the system component starts or trips [breaker logic] and expected system response including power loss or failed components.

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified VISION System/Question ID: Question Source: Previous 2 Exams:		718183 ILT Bank No		
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 2:DR
	NUREG 1021 Appendix B: Describing or recognizing Relationships			
10CRF55 Content	55.41b	7	55.43b	
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			

EXAMINATION ANSWER KEY

OC RO NRC 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.:	**400000**	**PRA:**	**No**
Safety Function:	**8**	☒ **Initial License Level** ☐ **LORT**	

EXAMINATION ANSWER KEY

OC RO NRC Exam

8 **ID: 11-1 NRO 08** **Points: 1.00**

The plant was at rated power when an event occurred. The following conditions exist:

- 4160 VAC Bus 1C is de-energized
- Emergency Diesel Generator (EDG)-1 has failed to auto start
- Attempts to Fast Start EDG-1 from the Control Room have failed

An operator has manually started EDG-1 from its local cubicle IAW procedure 341, Emergency Diesel Generator Operation, section 8 'Manual Control for Deadline Pickup From The Diesel Generator Switchgear'.

A steady state loading condition has been attained IAW the procedure.

Which of the following is the correct response to EDG-1 FREQUENCY and KILOWATTS if the EDG-1 **GOVERNOR CONTROL** switch at the local panel is momentarily placed in the **LOWER** position for 1 second?

	FREQUENCY	KILOWATTS
A.	lower	remain constant
B.	lower	lower
C.	remain constant	lower
D.	remain constant	remain constant

Answer: A

Answer Explanation

QID: 11-1 NRO 08		
Question #	8	Developer / Date: JJR / 5-14-2012

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

EXAMINATION ANSWER KEY

OC RO NRC Exam

264000 EDGs K4.06 - Knowledge of EMERGENCY GENERATORS (DIESEL/JET) design feature(s) and/or interlocks which provide for the following: Governor control				2.6	2.7
Level	RO	Tier	2	Group	1
General References	341 section 8		GFES: Motors and Generators		
Explanation	A is Correct. When the EDG is not in parallel with another generator/grid/electric power source, the GOVERNOR CONTROL switch controls EDG Frequency (Speed). The VOLTAGE CONTROL switch controls EDG Kilowatts (KW) (real load) in this situation. Placing the GOVERNOR CONTROL switch in LOWER will cause EDG Speed to lower but will have no affect on EDG Kilowatts. Answer B is Incorrect. EDG KW will remain constant. Distractor is plausible if the candidate believes that load will lower. Answer C is Incorrect. EDG Speed will lower. Distractor is plausible if the candidate believes that speed will lower. Answer D is Incorrect. EDG Speed will lower. Distractor is plausible if the candidate believes that a 1 second switch manipulation will not have a significant affect on frequency or KW.				
References to be provided during exam:	None				
Lesson Plan Learning Objective/	2621.828.0.0013, Emergency Diesel Generators EDG-10446, Identify and explain system operating controls / indications under all plant operating conditions.				

Question Source (New, Modified, Bank)	Bank
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:	 811748 ILT Bank No

EXAMINATION ANSWER KEY

OC RO 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	**55.41b**	**7**	**55.43b**	
	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**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

9 **ID: 11-1 NRO 09** **Points: 1.00**

The plant is starting up with the REACTOR MODE SELECTOR switch in STARTUP. All SRMs indicate between 50 – 100 CPS.

While withdrawing the 8th control rod, the following annunciator alarmed:

- SRM DNSCL

The Operator reports the following indications:

- IRM DN SCL OR INOP lights ON for ALL IRMs
- IRM DNSCL annunciator is in alarm
- SRM ALL IN light extinguished
- IRM ALL IN light is in alarm

Which **ONE** of the following states the plant response to the conditions listed above **AND** what directly caused the alarm and indications above?

	Plant Response	**Cause of the Event**
A.	Rodblock	SRM downscale
B.	Rodblock	SRM not fully inserted
C.	Alarm **ONLY**	SRM not fully inserted
D.	Rodblock	IRM downscale

Answer: B

Answer Explanation		
QID: 11-1 NRO 09		
Question #	**9**	**Developer / Date: JJR / 5-14-2012**

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

EXAMINATION ANSWER KEY

OC RO NRC Exam

215004 Source Range Monitor K5.01 - Knowledge of the operational implications of the following concepts as they apply to SOURCE RANGE MONITOR (SRM) SYSTEM : Detector operation				**2.6**	**2.6**
Level	**RO**	**Tier**	**2**	**Group**	**1**
General References	**RAP-G5d**		**RAP-H7a**		
Explanation	**B is Correct. The question stem shows a plant startup when the SRM downscale annunciator alarms. The impact of this alarm is an alarm only, if the associated SRM is fully inserted. If the associated SRM is not fully inserted, then a rodblock is applied. With all SRMs fully inserted, the SRM ALL IN light will be energized. With this light extinguished, then at least 1 SRM is not full in. The operator cannot tell which SRM is not fully inserted, only that 1 or more are not fully inserted. A non-fully inserted SRM would produce a reduction in counts, and thus, the SRM downscale annunciator is expected when counts go down enough. The rod block RAP (H7a) also states that a rod block is inserted when any SRM is < 500 cps and not fully inserted with the Mode Switch in STARTUP.** **A is Incorrect but plausible. Even though a Rodblock does exist, the cause of the event was a SRM not fully inserted, not an SRM downscale condition** **C is Incorrect but plausible. SRM not fully inserted does not energize any audible alarm but does produce a visual alarm on the rod block panel. But the given conditions also produce a rod block.** **D is Incorrect but plausible if the applicant does not recognize that an IRM downscale is an expected condition on a startup. Any impact from a downscale IRM is bypassed while in Range 1, which is where the IRMs should currently be.**					
References to be provided during exam:	**None**				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Lesson Plan	**2621.828.0.0029, Nuclear Instrumentation**
Learning Objective/	**NIS-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)			**Modified**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**667517** **ILT 08-1 Audit Exam** **No**		
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	**55.41b**	**6**	**55.43b**	
	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.:	**215004**	**PRA:**	**No**	
Safety Function:	**7**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

10 **ID: 11-1 NRO 10** **Points: 1.00**

Given the following plant conditions:

- Both sets of ADS timers have initiated due to a LOCA.
- Drywell pressure drops to 2.5 psig due to containment failure.
- ADS Timer "A" bypass switch has been taken to BYPASS.
- ADS Timer "B" bypass switch cannot be repositioned from AUTO due to switch failure.
- **NO** other operator actions are taken.

Based on these plant conditions, the Automatic Depressurization System (ADS) will _____.

A. **NOT** initiate because it is bypassed.

B. initiate **and** ALL 5 EMRVs will open.

C. initiate but "A" and "D" EMRVs will open **ONLY**.

D. **NOT** initiate because drywell pressure is 2.5 psig.

Answer: B

Answer Explanation		
QID: 11-1 NRO 10		
Question #	**10**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
218000 ADS K5.01 - Knowledge of the operational implications of the following concepts as they apply to AUTOMATIC DEPRESSURIZATION SYSTEM : ADS logic operation				**3.8**	**3.8**
Level	**RO**	**Tier**	**2**	**Group**	**1**
General References	**GE729E182**	**RAP-B1g**			

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**B is Correct. ADS is actuated on simultaneous occurrence of high drywell pressure (> 2.9 psig), lo-lo-lo reactor water level (64.6" TAF), and core spray system operation as verified by a differential pressure across the core spray booster pump (DP > about 30 psid) after the ADS timers have timed out for 105 seconds. Upon initiation all five EMRVs open in a staggered fashion within 5 seconds.** **A is Incorrect but plausible. Both bypass switches must be taken to bypass in order to prevent ADS initiation following the 105 second time delay.** **C is Incorrect but plausible since the "A" timer is bypassed. It is true that ADS will initiate, however, after the "A" and "D" EMRVs initially open the other valves will open following a short time delay.** **D is Incorrect but plausible. Hi drywell pressure is a seal-in contact and must be reset to prevent the initiation from occurring.**
References to be provided during exam:	**None**
Lesson Plan **Learning Objective/**	**2621.828.0.0005, Automatic Depressurization System** **ADS-368, Describe the EMRV initiation logic for both overpressure operation and operation in the ADS mode. Include the following: 1. Initiation signals and setpoints 2. Timers and setpoints 3. Control switches 4. Panel indications**

Question Source (New, Modified, Bank)			**Bank**	
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:	**505517 ILT Bank No**			
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			

EXAMINATION ANSWER KEY

OC RO NRC Exam

10CRF55 Content	55.41b	5	55.43b	
	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.:	218000	PRA:	No	
Safety Function:	3	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC RO NRC Exam

11 **ID: 11-1 NRO 11** **Points: 1.00**

Which one of the following statements describes what happens on a loss of Vital MCC-1B2?

(ATS = Automatic Transfer Switch)
(CIP = Continuous Instrument Panel)

A. ATS IT-3 will transfer CIP-3 to the alternate power source and then back to the rotary inverter after the DC motor starts.

B. ATS IT-3 will transfer CIP-3 to the alternate power source but will **NOT** transfer back to the rotary inverter after the DC motor starts.

C. The rotary inverter AC motor will continue to run ensuring power to CIP-3 is not interrupted; ATS IT-3 will **NOT** transfer to the alternate power source.

D. The rotary inverter DC motor will automatically start ensuring power to CIP-3 is not interrupted; ATS IT-3 will **NOT** transfer to the alternate power source.

Answer: D

Answer Explanation

QID: 11-1 NRO 11		
Question #	**11**	**Developer / Date: JJR / 5-14-2012**

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**

EXAMINATION ANSWER KEY

OC RO NRC Exam

General References	**ABN-51**		
Explanation	**D is Correct. The rotary inverter DC motor will start, maintaining an uninterrupted generator output (due to the flywheel); ATS IT-3 will not transfer. CIP-3 is a UPS at Oyster Creek.** **A is Incorrect but plausible. ATS IT-3 will not transfer since the rotary output power remains essentially constant.** **B is Incorrect but plausible. ATS IT-3 will not transfer since the rotary output power remains essentially constant.** **C is Incorrect but plausible. A loss of VMCC-1B2 results in loss of power to the rotary inverter AC motor.**		
References to be provided during exam:	**None**		
Lesson Plan	**2621.828.0.0056, Vital AC Distribution**		
Learning Objective/	**VAC-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**	
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:	**505413 ILT Bank No**			
Cognitive Level	**Memory or Fundamental Knowledge**	**X 1:I**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: <u>I</u>nterlocks, setpoints, or system (singular) response			
10CRF55 Content	**55.41b**	**7**	**55.43b**	
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			

EXAMINATION ANSWER KEY

OC RO NRC 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.:	**262002**	**PRA:**	**No**
Safety Function:	**6**	☒ **Initial License Level** ☐ **LORT**	

EXAMINATION ANSWER KEY

OC RO NRC Exam

12 **ID: 11-1 NRO 12** **Points: 1.00**

The plant was at rated power when a **STATION BLACKOUT** occurred.

Under the conditions:

1. Can the Isolation Condenser System be manually initiated from the Control Room?
2. Can makeup water be provided to the Isolation Condenser shells (includes both Control Room and local actions)?

	1	2
A.	Yes	No
B.	Yes	Yes
C.	No	No
D.	No	Yes

Answer: B

Answer Explanation		
QID: 11-1 NRO 12		
Question #	**12**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information		
K&A	**Importance Rating**	
	RO	**SRO**
207000 Isolation (Emergency) Condenser K6.07 - Knowledge of the effect that a loss or malfunction of the following will have on the ISOLATION (EMERGENCY) CONDENSER : A.C. power: BWR-2,3	**3.0**	**3.2**

Level	**RO**	**Tier**	**2**	**Group**	**1**
General References	**ABN-37**		**307**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**B is Correct. The plant was at power when a station blackout occurred. There is no AC power in the station. In the normal configuration, the steam admission valves to each IC are open, one condensate return valve is open, and the second condensate return valve is closed. The closed valve is DC powered and can be manipulated with a loss of AC power.** **Filling of the shells usually requires AC power to a water pump. With AC gone, these AC powered pumps are lost. But the shells can also be filled by the Fire Protection water system, which under the given conditions, will be pressurized by diesel driven fire pumps. The makeup valves are air operated, with air accumulators, and fail closed on loss of air. Even if the accumulators discharged, they can be manually manipulated in the plant locally.** **Therefore, the isolation condensers can be initiated in the control room and the shells can be filled from fire protection with the total loss of AC power.** **All distractors are Incorrect but plausible if the applicant does not recall about the use of fire protection water supplied by the fire diesels or power supplies to the system valves and the normal standby lineup.**
References to be provided during exam:	**None**
Lesson Plan	**2621.828.0.0023, Isolation Condenser System**
Learning Objective/	**ICS-2338, Given plant conditions, evaluate the impact on the Isolation Condenser System and the plant.**

Question Source (New, Modified, Bank)	Bank
If Bank or Modified	
VISION System/Question ID:	**663375**
Question Source:	**ILT Bank**
Previous 2 Exams:	**No**

EXAMINATION ANSWER KEY

OC RO NRC Exam

Cognitive Level	Memory or Fundamental Knowledge	X 1:F	Comprehension or Analysis	
	NUREG 1021 Appendix B: Facts			
10CRF55 Content	55.41b	7	55.43b	
	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.:	207000	PRA:	No	
Safety Function:	4	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC RO NRC Exam

13 **ID: 11-1 NRO 13** **Points: 1.00**

The plant is at 100% power with the following conditions:

- Battery "A" is on the Battery Charger M-G "A"
- Battery "B" is on the A-B Static Charger

The breaker from USS 1B2 to MCC 1B21 then opens.

Based on the above conditions, with no operator action, how is battery voltage affected?

Voltage indication for...

A. "A" battery will begin to lower **ONLY**.

B. "B" battery will begin to lower **ONLY**.

C. "A" & "B" battery will begin to lower.

D. "A" & "B" battery will **NOT** change.

Answer: B

Answer Explanation		
QID: 11-1 NRO 13		
Question #	**13**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
263000 DC Electrical Distribution A1.01 - Ability to predict and/or monitor changes in parameters associated with operating the D.C. ELECTRICAL DISTRIBUTION controls including: Battery charging/discharging rate				**2.5**	**2.8**
Level	**RO**	**Tier**	**1**	**Group**	**1**

EXAMINATION ANSWER KEY

OC RO NRC Exam

General References	**RAP-U3e**		
Explanation	**B is Correct. IAW RAP U-3-e, A/B BAT CHG DRV MOT TRIP, loss of MCC 1B21 with B battery on static charger will place DC-B bus directly on the battery and its voltage indication will begin to lower.** **A & C are Incorrect but plausible if the applicant doesn't recall A Battery is still on its MG set (VMCC 1B2) and its bus voltage will not lower.** **D is Incorrect but plausible if the applicant doesn't recall B battery voltage will begin to lower.**		
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**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**	**510794** **ILT Bank** **No**			
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 (AC and DC system interaction)			

EXAMINATION ANSWER KEY

OC RO NRC Exam

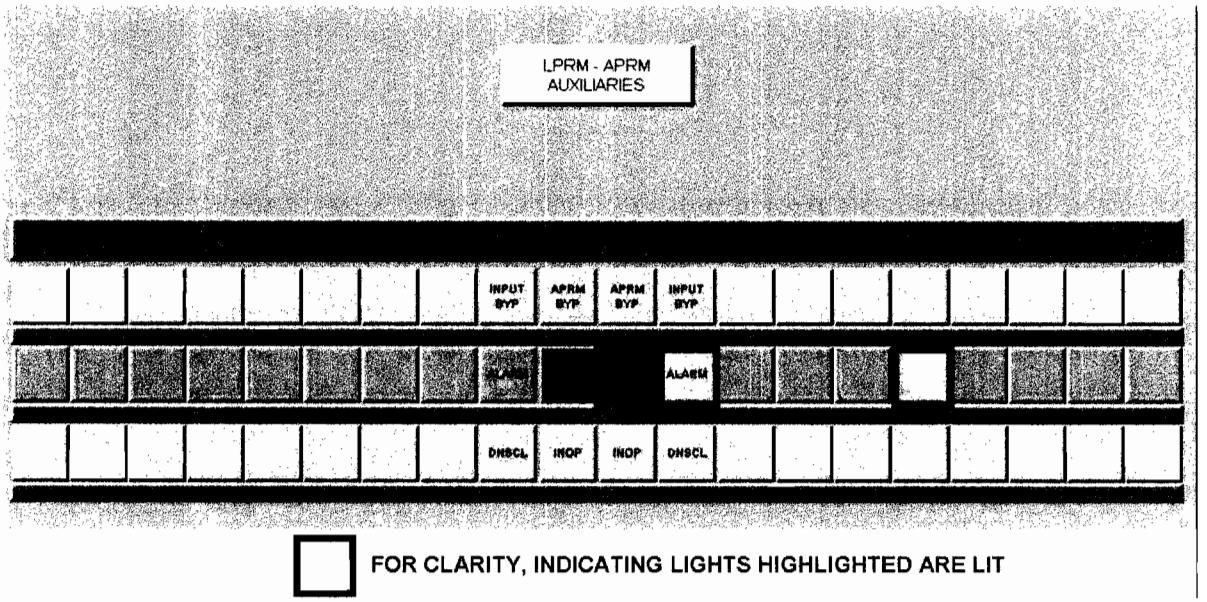
10CRF55 Content	55.41b	5	55.43b	
	Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.			
Justification for LORT questions with K/A values < 3.0	N/A			
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	263000	PRA:	No	
Safety Function:	6	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC RO NRC Exam

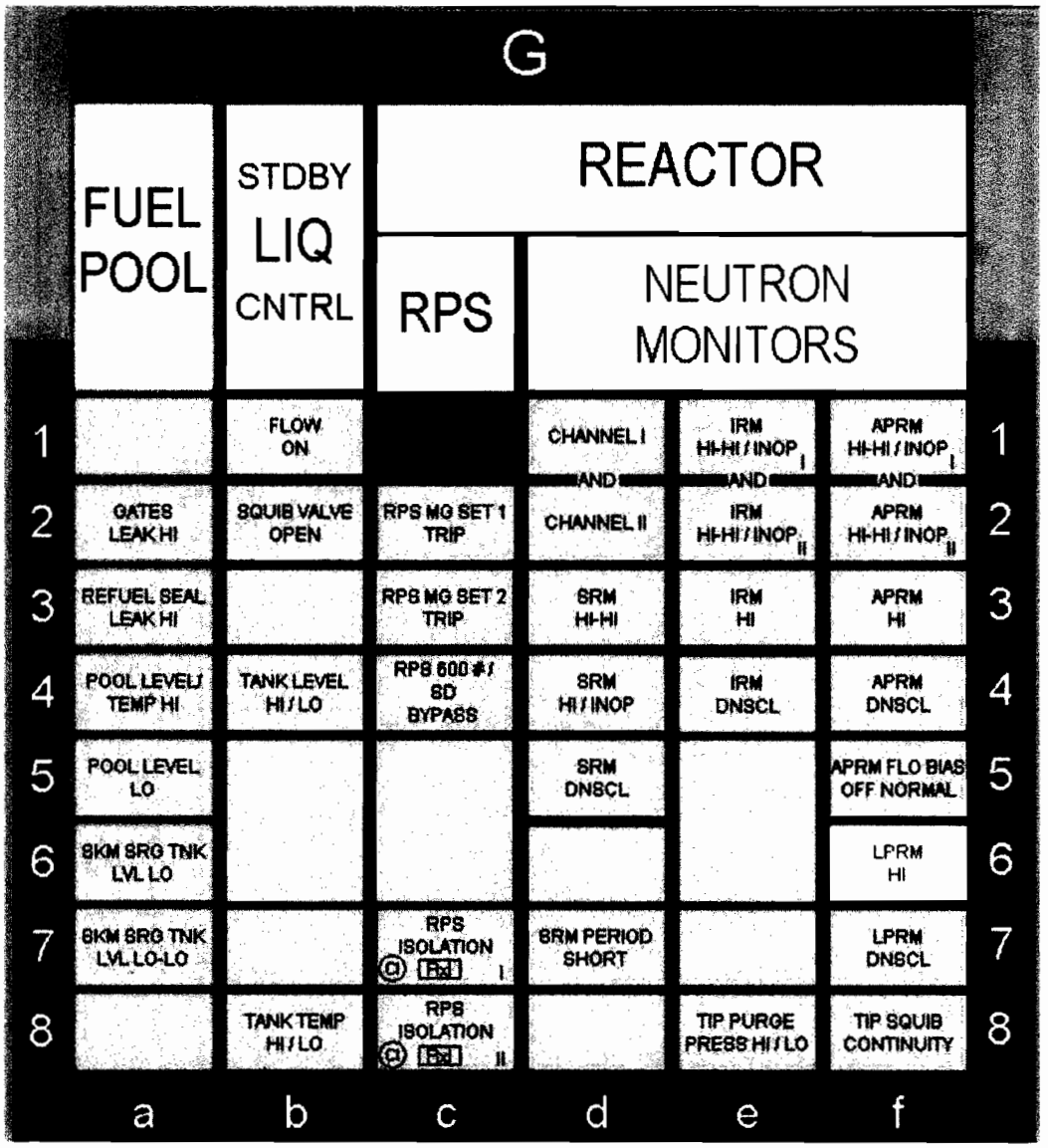
14 **ID: 11-1 NRO 14** **Points: 1.00**

The plant was at rated power when an event occurred. The BOP observed the following indications on Panel 3R:

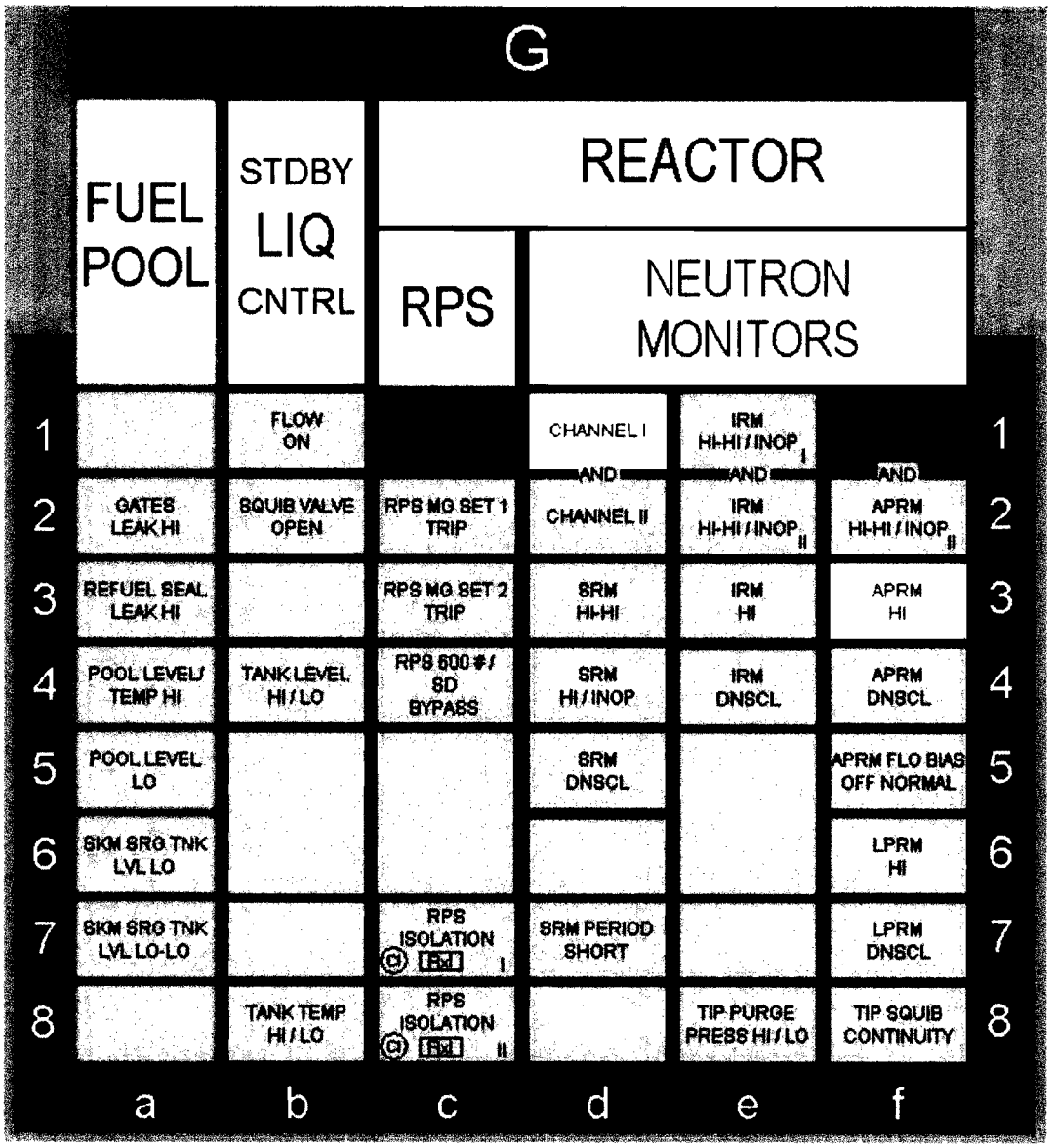


Based on these indications, which of the following Annunciator Panel G indications correctly corresponds to the Panel 3R indications above?

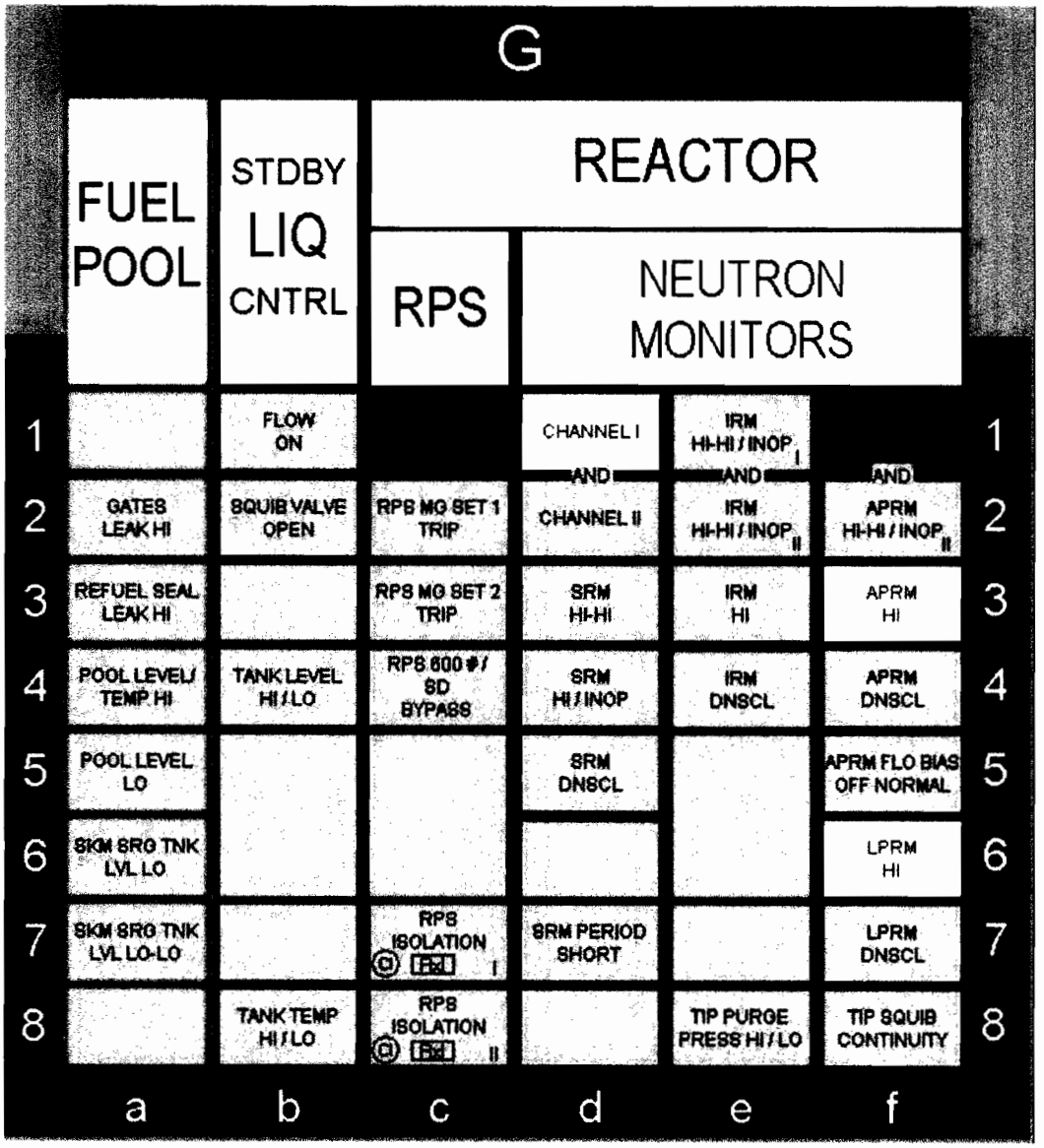
A.


G
FUEL POOL
STDBY LIQ CNTRL
REACTOR
RPS
NEUTRON MONITORS
1 FLOW ON CHANNEL I AND IRM HI-HI / INOP I AND APRM HI-HI / INOP I 1
2 GATES LEAK HI SQUIB VALVE OPEN RPS MG SET 1 TRIP CHANNEL II IRM HI-HI / INOP II APRM HI-HI / INOP II 2
3 REFUEL SEAL LEAK HI RPS MG SET 2 TRIP SRM HI-HI IRM HI APRM HI 3
4 POOL LEVEL/ TEMP HI TANK LEVEL HI / LO RPS 600 # / SD BYPASS SRM HI / INOP IRM DNSCL APRM DNSCL 4
5 POOL LEVEL LO SRM DNSCL APRM FLO BIAS OFF NORMAL 5
6 SKM SRG TNK LVL LO LPRM HI 6
7 SKM SRG TNK LVL LO-LO RPS ISOLATION (C) Rx I SRM PERIOD SHORT LPRM DNSCL 7
8 TANK TEMP HI / LO RPS ISOLATION (C) Rx II TIP PURGE PRESS HI / LO TIP SQUIB CONTINUITY 8
a b c d e f

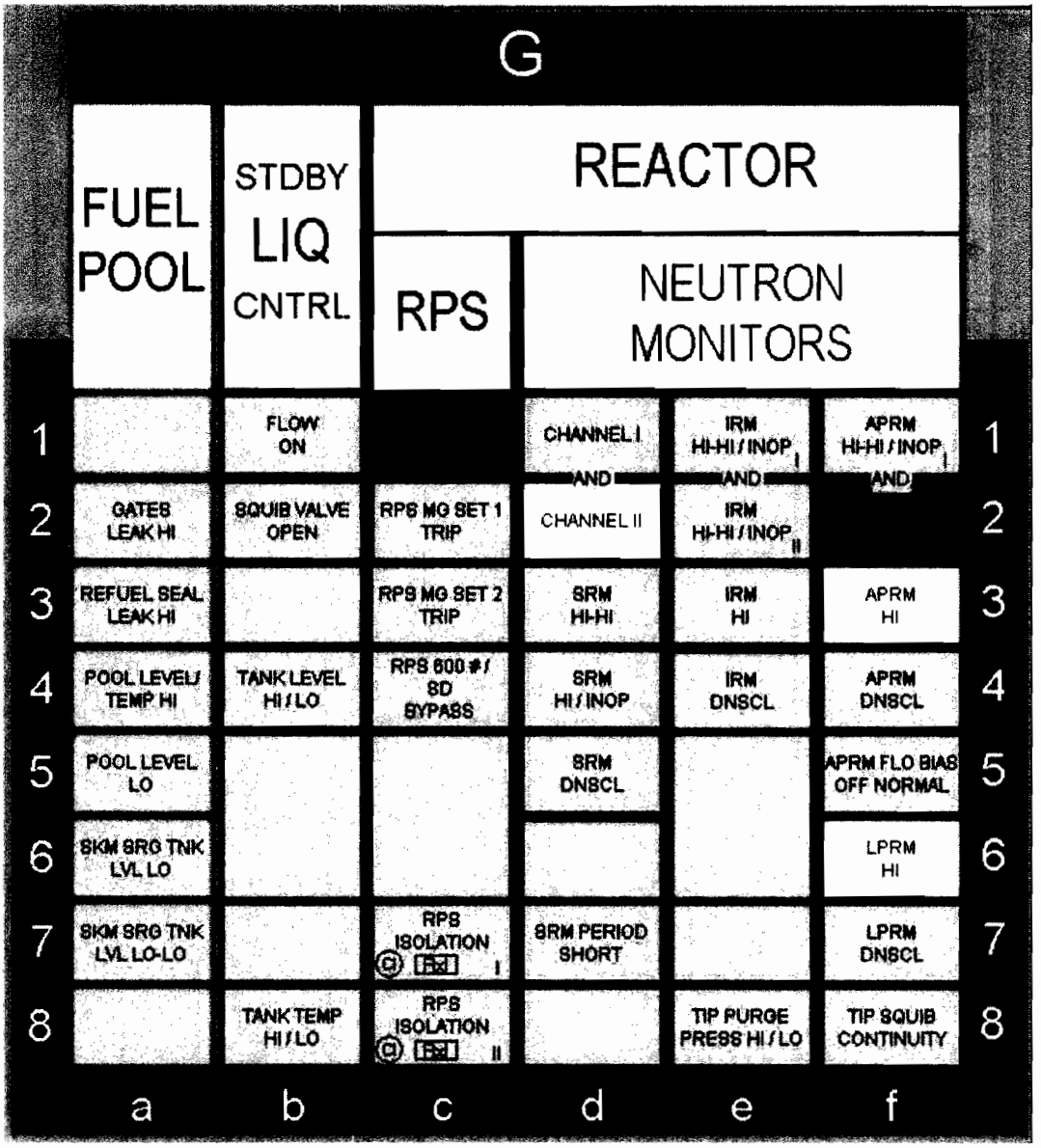
B.


G
FUEL POOL
STDBY LIQ CNTRL
REACTOR
RPS
NEUTRON MONITORS
1 FLOW ON CHANNEL I AND IRM HI-HI / INOP I AND AND 1
2 GATES LEAK HI SQUIB VALVE OPEN RPS MG SET 1 TRIP CHANNEL II IRM HI-HI / INOP II APRM HI-HI / INOP II 2
3 REFUEL SEAL LEAK HI RPS MG SET 2 TRIP SRM HI-HI IRM HI APRM HI 3
4 POOL LEVEL/ TEMP HI TANK LEVEL HI / LO RPS 600 #/ SD BYPASS SRM HI / INOP IRM DNSCL APRM DNSCL 4
5 POOL LEVEL LO SRM DNSCL APRM FLO BIAS OFF NORMAL 5
6 SKM SRG TNK LVL LO LPRM HI 6
7 SKM SRG TNK LVL LO-LO RPS ISOLATION (C) Rx I SRM PERIOD SHORT LPRM DNSCL 7
8 TANK TEMP HI / LO RPS ISOLATION (C) Rx II TIP PURGE PRESS HI / LO TIP SQUIB CONTINUITY 8
a b c d e f

C.


G
FUEL POOL
STDBY LIQ CNTRL
REACTOR
RPS
NEUTRON MONITORS
1 FLOW ON CHANNEL I AND IRM HI-HI / INOP I AND AND 1
2 GATES LEAK HI SQUIB VALVE OPEN RPS MG SET 1 TRIP CHANNEL II IRM HI-HI / INOP II APRM HI-HI / INOP II 2
3 REFUEL SEAL LEAK HI RPS MG SET 2 TRIP SRM HI-HI IRM HI APRM HI 3
4 POOL LEVEL/ TEMP HI TANK LEVEL HI / LO RPS 600 # / SD BYPASS SRM HI / INOP IRM DNSCL APRM DNSCL 4
5 POOL LEVEL LO SRM DNSCL APRM FLO BIAS OFF NORMAL 5
6 SKM SRG TNK LVL LO LPRM HI 6
7 SKM SRG TNK LVL LO-LO RPS ISOLATION I SRM PERIOD SHORT LPRM DNSCL 7
8 TANK TEMP HI / LO RPS ISOLATION II TIP PURGE PRESS HI / LO TIP SQUIB CONTINUITY 8
a b c d e f

D.



Answer: C

Answer Explanation		
QID: 11-1 NRO 14		
Question #	14	Developer / Date: JJR / 5-14-2012

Knowledge and Ability Reference Information	
K&A	Importance Rating

EXAMINATION ANSWER KEY

OC RO NRC Exam

	RO	SRO
215005 APRM / LPRM A1.05 - Ability to predict and/or monitor changes in parameters associated with operating the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM controls including: Lights and alarms	**3.3**	**3.2**

Level	RO	Tier	2	Group	1

General References	**RAP-G1c, G6f, G1f**		
Explanation	**C is Correct. The indications provided show an upscale trip of LPRM 44-25C. At rated power, this will result in this LPRMs corresponding APRM to indicate HI-HI. For this failure, annunciators G1c, G1d, G1f, G3f, and G6f will all be in the alarm condition on annunciator panel G. A is Incorrect but plausible. The applicant may recognize an LPRM has failed upscale but not recognize this results in its corresponding APRM failing upscale. At low power levels, this is true, but not at rated power. B is Incorrect but plausible. The applicant may not recognize annunciator G6f is not in alarm, which it would be based on the Panel 3R indications. D is Incorrect but plausible if the applicant confuses which RPS system was affected.**		
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)	**New**
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:	**N/A**

EXAMINATION ANSWER KEY

OC 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	**55.41b**	**5**	**55.43b**	
	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.:	**215005**	**PRA:**	**No**	
Safety Function:	**7**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

15 **ID: 11-1 NRO 15** **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?

	All EMRVs Acoustics Indicate In The...	**Required Action**
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: 11-1 NRO 15		
Question #	**15**	**Developer / Date: JJR / 5-14-2012**

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

EXAMINATION ANSWER KEY

OC RO NRC Exam

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**
Level	**RO**	**Tier**	**2**	**Group**	**1**
General References	**ED-no ATWS EOP**		**EOP User's Guide**		
Explanation	**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. 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. 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. 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.**				
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)	**Bank**

EXAMINATION ANSWER KEY

OC RO NRC Exam

If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**811782** **ILT 10-1 NRC Exam** **Yes**		
Cognitive Level	**Memory or Fundamental Knowledge**		**Comprehension or Analysis**	**X** **3:PEO**
	NUREG 1021 Appendix B: Predict an Event or Outcome			
10CRF55 Content	**55.41b**	**10**	**55.43b**	
	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**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

16 **ID: 11-1 NRO 16** **Points: 1.00**

The plant was at rated power when an event occurred requiring entry into ABN-58, Instrument Power Failures.

Which **ONE** of the following correctly describes a plant impact **AND** the action required to correct it?

	Plant Impact	Required Action Perform actions in ABN-58 for a loss of...
A.	**EXACTLY** 1/2 of the MSIV LEDs inside Panel 11F are **OFF**	VACP-1.
B.	**ALL** CRD HYDRAULIC SYSTEM analog meters on Panel 4F are DOWNSCALE	VACP-1.
C.	**EXACTLY** 1/2 of the MSIV LEDs inside Panel 11F are **OFF**	CIP-3.
D.	**ALL** CRD HYDRAULIC SYSTEM analog meters on Panel 4F are DOWNSCALE	CIP-3.

Answer: C

Answer Explanation		
QID: 11-1 NRO 16		
Question #	**16**	**Developer / Date: JJR / 5-14-2012**

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

EXAMINATION ANSWER KEY

OC RO NRC Exam

223002 PCIS/Nuclear Steam Supply Shutoff A2.06 - Ability to (a) predict the impacts of the following on the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Containment instrumentation failures				**3.0**	**3.2**
Level	**RO**	**Tier**	**2**	**Group**	**1**
General References	**RAP-J1a, J8b**		**ABN-58**		

Explanation	**C is Correct. The MSIVs are controlled by solenoids (to allow air/nitrogen operation). There is an AC solenoid for each MSIV (powered from CIP-3) and a DC solenoid for each MSIV (from DC-D or DC-F). To close the MSIVs, both the DC solenoid and the AC solenoid must de-energize for each MSIV. Inside Panel 11F, there are 4 sets of 2 LEDs: one set per MSIV. One LED is powered from the AC solenoid power supply, and the second LED per MSIV, is powered from the DC solenoid power supply. All LEDs are lit when all power supplies are normal. When CIP-3 is lost, the AC solenoid to each MSIV is de-energized and the respective LED for each MSIV goes out. Therefore, with CIP-3 lost, 1/2 of the LEDs are out, and the other 1/2 of the LEDs are energized (from DC power). The correct action is for the applicant to recognize that a loss of CIP-3 would result in this paticular containment instrument failure and the correct action to correct it is so perform actions required by ABN-58 for a loss of CIP-3.** **A is Incorrect but plausible if the applicant does not recall the correct power supply which would result in a loss of AC MSIV LEDs. VACP-1 is a vital AC power source and also has its own actions within ABN-58.** **B is Incorrect but plausible. The loss of CIP-3 will result in a loss of CRD RETURN FLOW IND on Panel 4F and render the Reactor Manual Controls System inoperable. The applicant may assume that CRD Hydraulic System analog meter indications were also affected and confuse these with a loss of VACP-1, also being a vital power supply to many indicators in the Control Room.** **D is Incorrect but plausible. The loss of CIP-3 will result in a loss of CRD RETURN FLOW IND on Panel 4F and render the Reactor Manual Controls System inoperable. The applicant may assume that CRD Hydraulic System analog meter indications were also affected, which they are not.**
References to be provided during exam:	**None**
Lesson Plan	**2621.828.0.0026, Main Steam System**
Learning Objective/	**MSS-10446, Identify and explain system operating controls / indications under all plant operating conditions.**

Question Source (New, Modified, Bank)	**New**

EXAMINATION ANSWER KEY

OC RO NRC Exam

If Bank or Modified VISION System/Question ID: Question Source: Previous 2 Exams:	**N/A**			
Cognitive Level	**Memory or Fundamental Knowledge**		**Comprehension or Analysis**	**X 2:DR**
	NUREG 1021 Appendix B: Describing or recognizing Relationships			
10CRF55 Content	**55.41b**	**7**	**55.43b**	
	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**	**☒ Initial License Level ☐ LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

17 **ID: 11-1 NRO 17** **Points: 1.00**

The plant is at rated power. An event with a radioactive source has resulted in the following conditions:

- REACTOR BUILDING VENT MANIFOLD #1 indicates 14 mR/hr
- REACTOR BUILDING VENT MANIFOLD #2 indicates 12 mR/hr
- Annunciator RX BLDG – VENT HI is in alarm

Which of the following states the correct Control Room indications from this event after all automatic action(s) have occurred?

A. RX BLDG DIFFERENTIAL PRESS indicates a slightly positive ΔP

B. STANDBY GAS OUTLET TEMP shows a higher than normal temperature

C. SGTS CROSSTIE valve V-28-48 indicates red light ON and green light OFF

D. REACTOR BUILDING VENT MANIFOLD #1 and #2 indicate a valid rising dose rate

Answer: B

Answer Explanation		
QID: 11-1 NRO 17		
Question #	**17**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information		
K&A	**Importance Rating**	
	RO	**SRO**
261000 SGTS A3.04 - Ability to monitor automatic operations of the STANDBY GAS TREATMENT SYSTEM including: System temperature	**3.0**	**3.1**

Level	**RO**	**Tier**	**2**	**Group**	**1**
General References	**RAP-10F1f**	**BR 2011 sh. 2**		**GU 3E-822-21-1000**	

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**B is Correct. Since the SGTS takes a suction on RB atmosphere, which includes steam, plus heaters in the STGS, and the energy from decay of radioactive particles in the stream, the SGTS discharge air temperature will be greater than normal.** **A is Incorrect but plausible. The indications provided in the stem will result in the isolation of the normal RB HVAC System and the auto start of the SGTS. SGTS is designed to maintain a negative RB ΔP.** **C is Incorrect but plausible. When SGTS auto starts, the SGTS CROSSTIE valve V-28-48 closes (green light ON).** **D is Incorrect but plausible. Since there is no air flow past the RB vent manifold radiation monitors when the normal RB HVAC isolates, the reading cannot be considered as valid reading of the RB atmosphere.**
References to be provided during exam:	None
Lesson Plan	2621.828.0.0042, Secondary Containment and SGTS
Learning Objective/	SGT-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: Previous 2 Exams:	608590 ILT Bank No			
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:PEO
	NUREG 1021 Appendix B: Predict an Event or Outcome			
10CRF55 Content	55.41b	7	55.43b	
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			

EXAMINATION ANSWER KEY

OC RO NRC 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**	☒ **Initial License Level** ☐ **LORT**	

EXAMINATION ANSWER KEY

OC RO NRC Exam

18 **ID: 11-1 NRO 18** **Points: 1.00**

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

- Drywell pressure is 3.6 psig and rising
- RPV water level is 120" and rising
- FEED PUMPS DISCHARGE PRESSURE indicates 800 psig

The Operator notes the following Core Spray System indications:

- MAIN PUMP AMPS NZ01A indicates 50 AC AMPERES
- MAIN PUMP AMPS NZ01D indicates 0 AC AMPERES
- SYS 1 FLOW indicates approximately 100 GPM
- SYS 2 PUMP DISCH PRESS BOOSTERS indicates approximately 330 psig

Which of the following is correct regarding the observed Core Spray indications?

A. Core Spray Pump NZ01D has tripped.

B. Core Spray Pump NZ01A is running on minimum flow.

C. Core Spray System 2 is **NOT** indicating the expected discharge head.

D. Core Spray System 1 **CANNOT** provide core cooling when the RPV depressurizes.

Answer: B

Answer Explanation		
QID: 11-1 NRO 18		
Question #	**18**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
209001 LPCS A3.02 - Ability to monitor automatic operations of the LOW PRESSURE CORE SPRAY SYSTEM including: Pump start				**3.8**	**3.7**
Level	**RO**	**Tier**	**2**	**Group**	**1**

EXAMINATION ANSWER KEY

OC RO NRC Exam

General References	341	RAP-B1e, B2e	UFSAR 6.3.1.3.3
Explanation	B is Correct. The question stem describes the plant at power when an event resulted in a low RPV water condition and a high drywell pressure condition. Under the given conditions, core spray 1 (main pump A and booster pump a) and core spray 2 (main pump B and booster pump B) will start. With feedwater discharge pressure at 800 psig, then RPV pressure is close to this value. With core spray running at an RPV pressure > 305 psig, the core spray parallel isolation valves are closed and core spray is running on minimum flow back to the torus. This flow is approximately 100 gpm. Therefore, core spray A has started and is running on minimum flow. A is Incorrect but plausible. As stated, core spray A and B start on their signals. Core spray C and D will still be in standby (off), unless a preferred core spray system fails. Since there is no indication of this in the question stem, then core spray D will be off and no amps is the expected condition – not tripped. C is Incorrect but plausible. With core spray system B running on minimum flow, the discharge pressure is approximately as listed in answer C. D is Incorrect but plausible since the provided indications are the expected indications, and core spray A will provide core cooling, as designed, when RPV pressure drops < 305 psig.		
References to be provided during exam:	None		
Lesson Plan	2621.828.0.0010, Core Spray System		
Learning Objective/	CSS-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)	Bank
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:	 609285 ILT Bank No

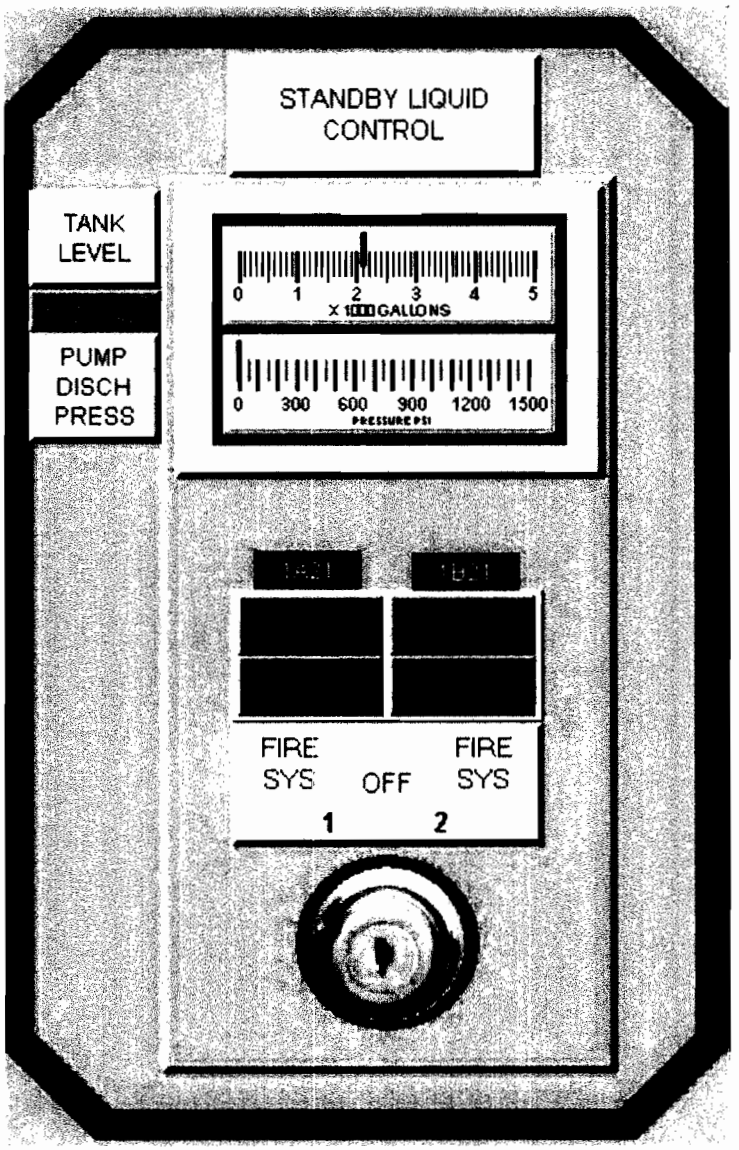
EXAMINATION ANSWER KEY

OC RO NRC Exam

Cognitive Level	**Memory or Fundamental Knowledge**		**Comprehension or Analysis**	**X 3:PEO**
	NUREG 1021 Appendix B: Predict an Event or Outcome			
10CRF55 Content	**55.41b**	**7**	**55.43b**	
	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.:	**209001**	**PRA:**	**No**	
Safety Function:	**2 & 4**	☒ **Initial License Level** ☐ **LORT**		

19 **ID: 11-1 NRO 19** **Points: 1.00**

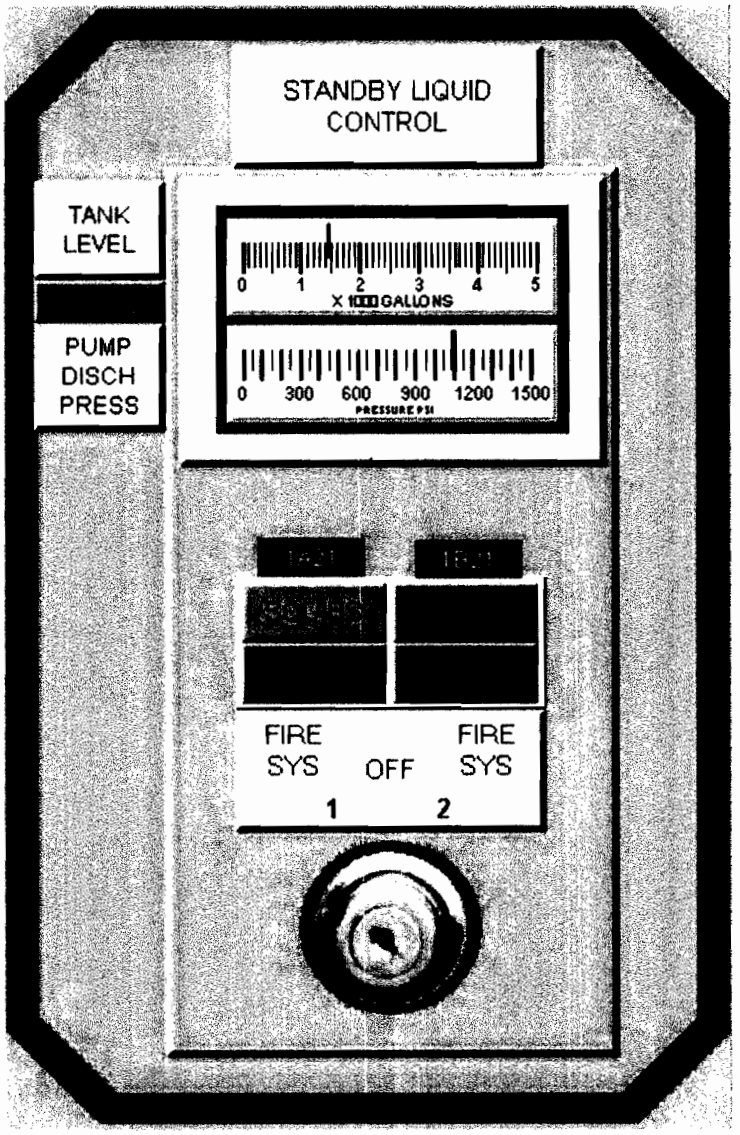
The plant is at rated power. The following Panel 4F indications are observed:



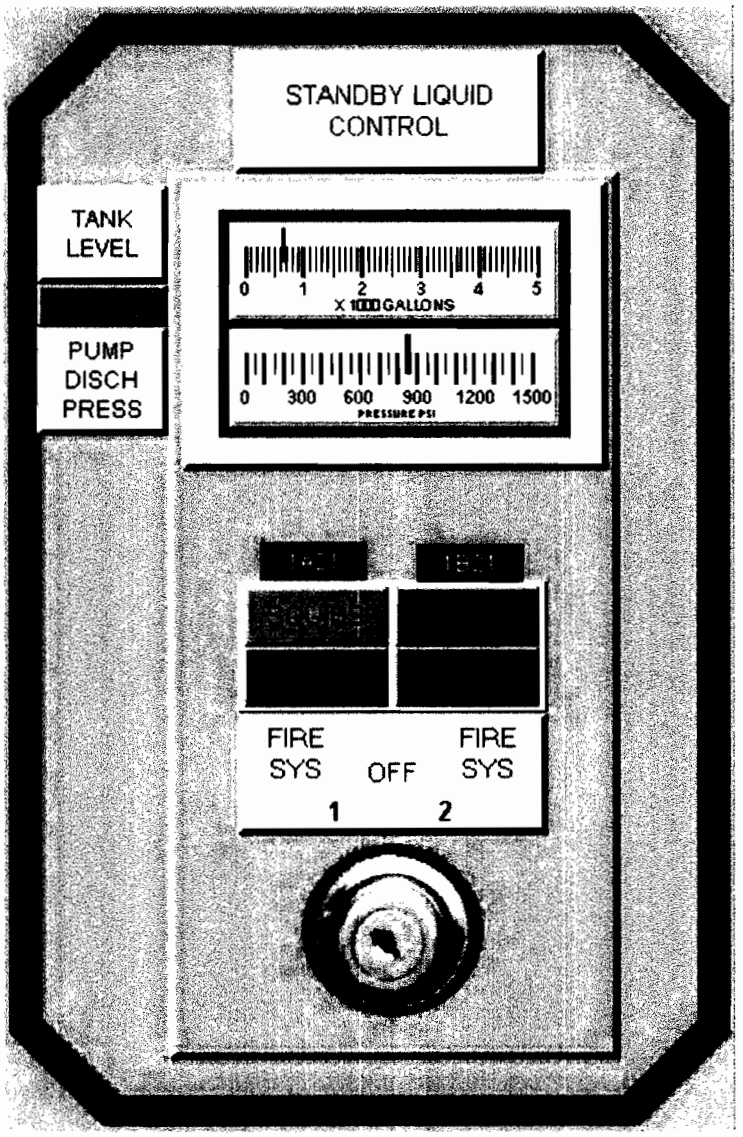
An event then occurred which resulted in an Electric ATWS. Actions required by RPV Control - with ATWS are being implemented by the crew.

IAW the EOP User's Guide, which of the following Panel 4F indications is the **FIRST** to indicate the reactor will remain shutdown under **ALL** conditions, regardless of control rod position or RPV water temperature?

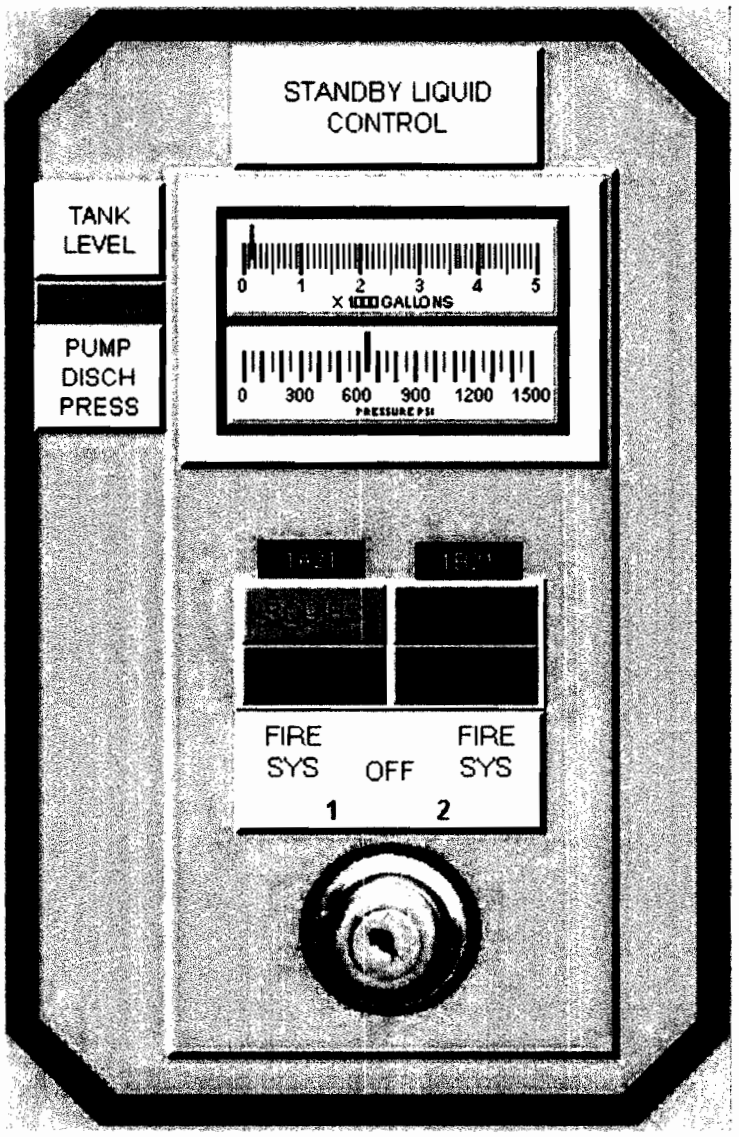
A.


STANDBY LIQUID CONTROL
TANK LEVEL
PUMP DISCH PRESS
0 1 2 3 4 5
X 1000 GALLONS
0 300 600 900 1200 1500
PRESSURE PSI
FIRE SYS 1
OFF
FIRE SYS 2

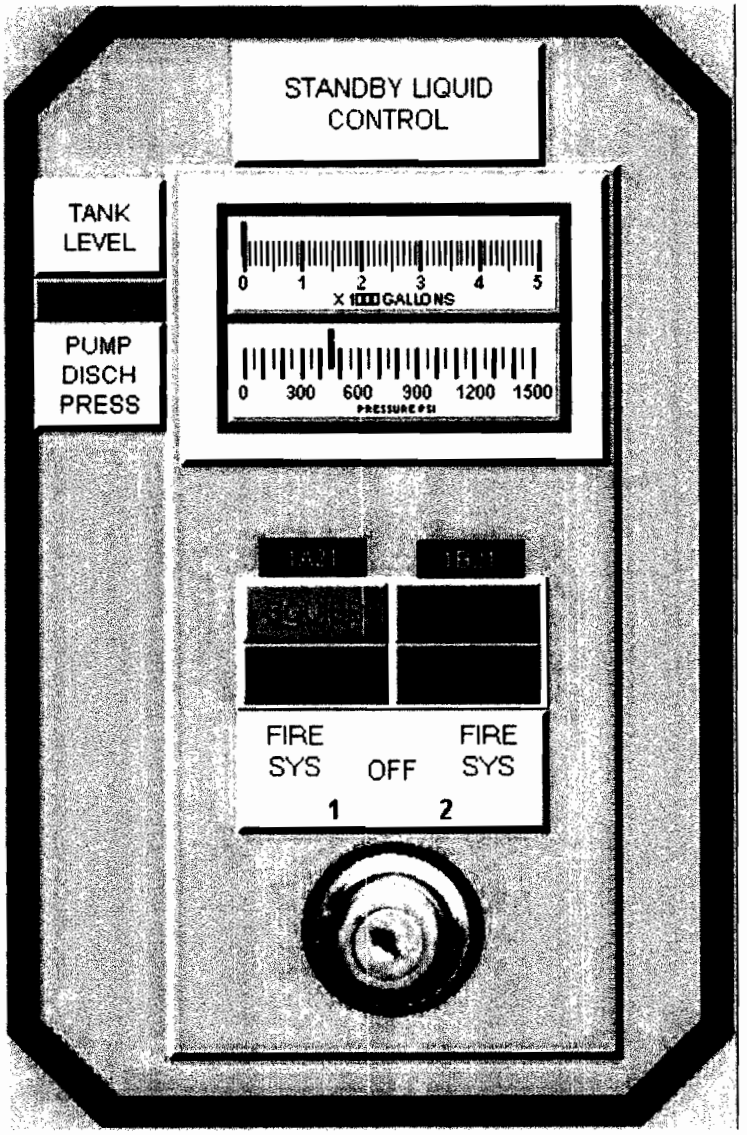
B.


STANDBY LIQUID CONTROL
TANK LEVEL
PUMP DISCH PRESS
0 1 2 3 4 5
X 1000 GALLONS
0 300 600 900 1200 1500
PRESSURE PSI
FIRE SYS
OFF
FIRE SYS
1
2

C.


STANDBY LIQUID CONTROL
TANK LEVEL
0 1 2 3 4 5
X 1000 GALLONS
PUMP DISCH PRESS
0 300 600 900 1200 1500
PRESSURE PSI
FIRE SYS
OFF
FIRE SYS
1
2

D.



Answer: C

Answer Explanation		
QID: 11-1 NRO 19		
Question #	19	Developer / Date: JJR / 5-14-2012

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

EXAMINATION ANSWER KEY

OC RO NRC Exam

211000 SLC A4.01 - Ability to manually operate and/or monitor in the control room: Tank level				**4.1**	**4.1**
Level	**RO**	**Tier**	**2**	**Group**	**1**
General References	**RPVC - with ATWS EOP**		**EOP User's Guide**		

Explanation	**C is Correct. The EOP Users Guide provides the following: The Cold Shutdown Boron Weight (CSBW) is defined to be the least weight of soluble boron which, if injected into the RPV and mixed uniformly, will maintain the reactor shutdown under all conditions regardless of control rod position or RPV water temperature.** **In the RPV Control - with ATWS and EMERGENCY DEPRESSURIZATION – with ATWS procedures, this amount is expressed as "Liquid Poison tank level at or below 150 gallons." 150 gallons in the Liquid Poison tank is equivalent to the elevation of the Liquid Poison pump suction line. When the Liquid Poison tank reaches this level, all available boron in the tank has been injected. With adherence to Technical Specifications limits, the Liquid Poison Tank will contain an amount of boron that is greater than the CSBW. For conservatism, all the liquid in the tank above the suction line will be injected. Therefore, injecting SLC until the tank volume indicates < 150 gallons ensures the CSBW is met and the reactor will remain shutdown under ALL conditions regardless of control rod positions. Choice C SLC tank indicates 150gal. The applicant's ability to manually monitor SLC tank level is required to answer this question.** **A is Incorrect but plausible. SLC tank indicates 1450 gal. The Hot Shutdown Boron Weight (HSBW) is achieved when 650 gallons of boron has been injected (2100 gal - 650 gal = 1450 gal). This corresponds to the amount of boron that will maintain the reactor shutdown under all hot standby conditions. The question specifically asks under <u>all</u> conditions.** **B is Incorrect but plausible. SLC tank indicates 650 gal. The applicant may confuse the requirement and assume the HSBW has been injected when SLC tank level indicates 650 gal, not when 650 gal has been injected.** **D is Incorrect. SLC tank indicates 0 gal. It is true the CSBW has been injected at this point however the question asks which is the FIRST of the four SLC tank indications the applicant can call the reactor shutdown under all conditions. The applicant may not recall the CSBW is considered injected when SLC tank level is at 150 gal.**
References to be provided during exam:	**None**

EXAMINATION ANSWER KEY

OC RO NRC 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)			**New**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**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	**55.41b**	**10**	**55.43b**	
	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.:	**211000**	**PRA:**	**No**	
Safety Function:	**1**	☒ **Initial License Level** ☐ **LORT**		

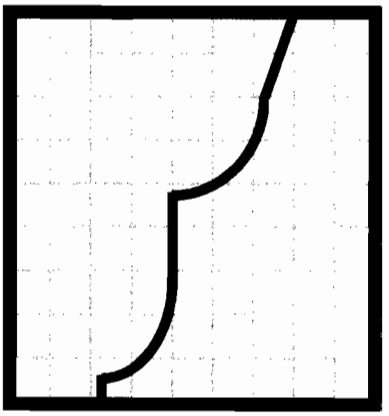
EXAMINATION ANSWER KEY

OC RO NRC Exam

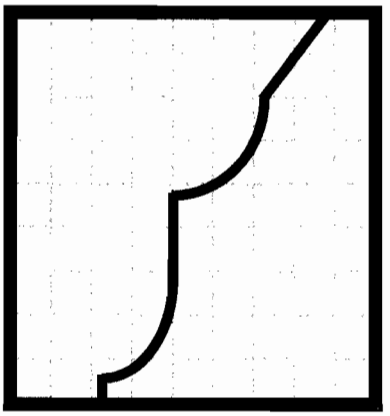
20 **ID: 11-1 NRO 20** **Points: 1.00**

The plant is starting up after an outage and the reactor has just been declared **CRITICAL IAW Procedure 201**, Plant Startup.

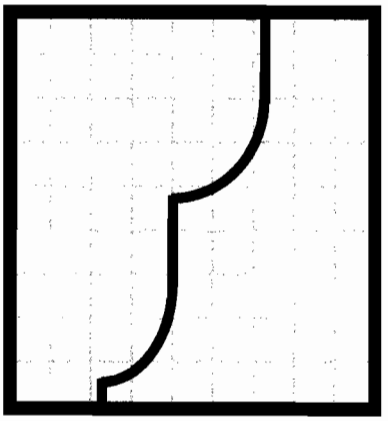
Which of the following SRM recorder charts shows that the reactor is critical with the **LONGEST** period? (**See below**)



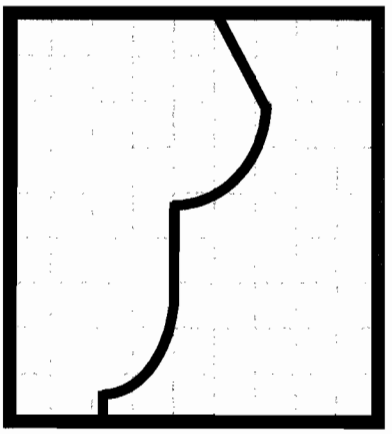
A



B



C



D

A. A

B. B

C. C

D. D

Answer: A

Answer Explanation

QID: 11-1 NRO 20		
Question #	20	Developer / Date: JJR / 5-14-2012

Knowledge and Ability Reference Information		
K&A	Importance Rating	
	RO	SRO
215004 Source Range Monitor A4.02 - Ability to manually operate and/or monitor in the control room: SRM recorder	3.0	3.1

Level	RO	Tier	2	Group	1
General References	201				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**A is Correct and B is Incorrect but plausible. The reactor has just been declared critical during a startup. When declared critical, the reactor state is actually slightly supercritical with counts rising at a constant rate. Procedure 201 defines the reactor is critical when neutron flux is increasing with a stable positive period, without additional control rod movement. 4 SRM charts are provided. SRM counts goes from left to right increasing. The top of each trace represents the current time and time goes from top to bottom increasing. Trace A shows a constant increase in counts, with a smaller slope than that in trace B, which is also critical.** **C & D are Incorrect but plausible. Trace C shows constant counts at the top of the trace and trace D shows lowering counts at the top of the trace. The applicant must recognize the reactor state when declared critical and must also know that counts is on the horizontal axis and time is on the vertical axis.**
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:** **Question Source:** **Previous 2 Exams:**	**663735** **ILT 08-1 NRC Exam** **No**			
Cognitive Level	**Memory or Fundamental Knowledge**		**Comprehension or Analysis**	**X** **3:SPK**
	NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			

EXAMINATION ANSWER KEY

OC RO NRC Exam

10CRF55 Content	**55.41b**	**1**	**55.43b**	
	Fundamentals of reactor theory, including fission process, neutron multiplication, source effects, control rod effects, criticality indications, reactivity coefficients, and poison effects.			
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**	
Safety Function:	**7**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

21 **ID: 11-1 NRO 21** **Points: 1.00**

The plant is at rated power. Electrical maintenance was hanging a tag on the breaker for the electrical bus that powers Shutdown Cooling (SDC) Outlet Isolation Valve, V-17-54.

An event then occurred and the electrical bus tripped offline. Which of the following electrical busses is V-17-54 powered from **AND** was an LCO for Tech Spec 3.7 affected?

	V-17-54 Power Supply	TS 3.7 LCO affected?
A.	MCC 1A12	Yes
B.	MCC 1AB2	Yes
C.	MCC 1A12	No
D.	MCC 1AB2	No

Answer: B

Answer Explanation		
QID: 11-1 NRO 21		
Question #	21	Developer / Date: JJR / 5-14-2012

Knowledge and Ability Reference Information		
K&A	Importance Rating	
	RO	SRO
205000 Shutdown Cooling 2.2.22 - Equipment Control: Knowledge of limiting conditions for operations and safety limits.	4.0	4.7

Level	RO	Tier	2	Group	1
General References	305				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	B is Correct. The electrical bus that powers SDC Outlet Isolation Valve, V-17-54, is Vital MCC 1AB2. TS 3.7 states that a loss of this electrical bus requires that plant is placed in the COLD SHUTDOWN condition within 30 hrs. A RO is required to know that this TS is affected but not the actual LCO. All distractors are Incorrect but plausible if the applicant fails to recall the correct power supply or that TS 3.7 is affected. MCC 1A12 is not affected by TS 3.7.
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: Previous 2 Exams:			N/A	
Cognitive Level	Memory or Fundamental Knowledge	X 1:F	Comprehension or Analysis	
	NUREG 1021 Appendix B: Facts			
10CRF55 Content	55.41b	5	55.43b	
	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.:	205000	PRA:	No	

EXAMINATION ANSWER KEY

OC RO NRC Exam

Safety Function:	**4**	☒ **Initial License Level** ☐ **LORT**

EXAMINATION ANSWER KEY

OC RO NRC Exam

22 **ID: 11-1 NRO 22** **Points: 1.00**

Which of the following design features of the EMRVs and associated piping prevents siphoning of water into the discharge piping?

EMRV discharge piping _____ .

A. Y-quencher

B. slotted openings

C. vacuum breakers

D. in-line check valves

Answer: C

Answer Explanation		
QID: 11-1 NRO 22		
Question #	**22**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
239002 SRVs 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**	**1**
General References	**BR 2002 sh. 1**				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	C is Correct. The purpose/function of the EMRV discharge piping vacuum breakers is that it is designed to break vacuum in the piping upon closure of the EMRV so that the vacuum established by steam condensation does not draw water into the discharge piping. All distractors are Incorrect but plausible if the applicant is not familiar with major components of the SRV/EMRV system. Y-quenchers represents the shape of the piping and does not prevent siphoning. There are no in-line check valves in the piping, and there are no slotted openings in the discharge piping.
References to be provided during exam:	None
Lesson Plan	2621.828.0.0026, Main Steam System
Learning Objective/	MSS-10453, Given plant operating conditions, describe or explain the purpose/function of the system and its components.

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified VISION System/Question ID: Question Source: Previous 2 Exams:	609059 ILT Bank No			
Cognitive Level	Memory or Fundamental Knowledge	X 1:B	Comprehension or Analysis	
	NUREG 1021 Appendix B: Bases or purpose			
10CRF55 Content	55.41b	7	55.43b	
	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.:	239002	PRA:	No	

EXAMINATION ANSWER KEY

OC RO NRC Exam

Safety Function:	**3**	☒ **Initial License Level** ☐ **LORT**

EXAMINATION ANSWER KEY

OC RO NRC Exam

23 **ID: 11-1 NRO 23** **Points: 1.00**

One of the prerequisites for operating 125 VDC Distribution Systems A & B, is to ensure Battery Room ventilation is operating IAW procedure 331, Office Building Heating, Ventilation and Air Conditioning System operating procedure.

Which of the following correctly describes the basis of this requirement?

A. Battery Rooms must be maintained at a negative pressure.

B. Battery Room ventilation is required to achieve proper float voltage.

C. Battery Room ventilation is required to prevent hydrogen accumulation.

D. Battery Room ventilation raises the capacity of the battery by keeping its temperature in the procedural range.

Answer: C

Answer Explanation		
QID: 11-1 NRO 23		
Question #	**23**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
263000 DC Electrical Distribution K5.01 - Knowledge of the operational implications of the following concepts as they apply to D.C. ELECTRICAL DISTRIBUTION : Hydrogen generation during battery charging.				**2.6**	**2.9**
Level	**RO**	**Tier**	**2**	**Group**	**1**
General References	**331**		**340.1**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**C is Correct. Procedure 331 and 340.1 requires battery room ventillation be in service prior when the batteries are in service to prevent hydrogen accumulation which is an explosive hazard. Unless there is an emergency or surveillance, the batteries always operate on a float charge (K/A match). Only in an emergency or surveillance are the batteries discharging and supplying power to DC loads.** **A is Incorrect but plausible. The ventilation basis is not to maintain negative pressure.** **B is Incorrect but plausible. The ventilation does not affect the float voltage, however the applicant may not recognize this is not the correct basis.** **D is Incorrect but plausible since batteries are more efficient at lower temperatures, however this is not the correct basis.**
References to be provided during exam:	**None**
Lesson Plan **Learning Objective/**	**2621.828.0.0012, DC Distribution** **DCD-10447, Given normal operating procedures and documents for the system, describe or interpret the procedural steps.**

Question Source (New, Modified, Bank)			**Bank**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**510793** **ILT Bank** **No**		
Cognitive Level	**Memory or Fundamental Knowledge**	**X** **1:P**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: Procedure steps and cautions			

EXAMINATION ANSWER KEY

OC RO NRC Exam

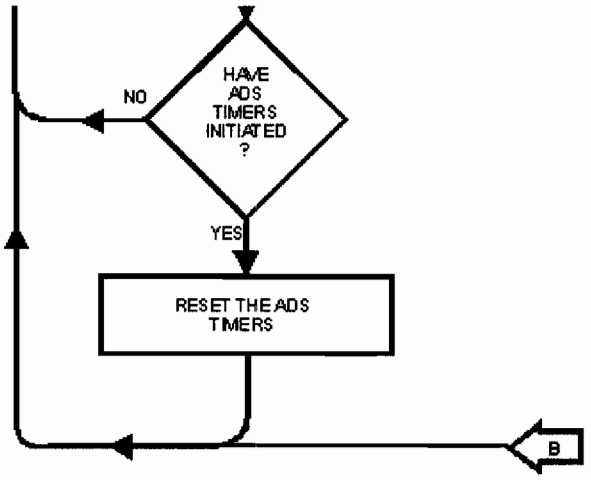
10CRF55 Content	55.41b	5	55.43b	
	Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.			
Justification for LORT questions with K/A values < 3.0	N/A			
Time to Complete: 1-2 minutes		Point Value: 1		
System ID No.:	263000	PRA:	No	
Safety Function:	6	☒ Initial License Level ☐ LORT		

24 **ID: 11-1 NRO 24** **Points: 1.00**

The plant was at rated power when a LOCA occurred. The crew is executing the RPV Control - no ATWS EOP. The following plant conditions currently exist:

- ADS TIMER A START I annunciator is in alarm
- ADS TIMER A START II annunciator is in alarm
- ADS TIMER B START I annunciator is in alarm
- ADS TIMER B START II annunciator is in alarm
- Drywell Pressure indicates 1.8 psig and slowly lowering
- Reactor water level lowered to 50 in and is now 100 inches and slowly rising

The US then directs the BOP to RESET THE ADS TIMERS (see EOP figure below).



IAW the RPV Control - no ATWS EOP, which of the following actions are required to reset the ADS timers?

1. Place all EMRV AUTO DEPRESS VALVE control switches to OFF then back to AUTO.
2. Place both ADS TIMER AUTO BYPASS keylock switches to BYPASS then back to AUTO.
3. Place both HI DRYWELL PRESSURE SWITCH keylock switches to RESET then back to AUTO.

A. 2 **ONLY**

B. 3 **ONLY**

C. 1 and 2

D. 2 and 3

EXAMINATION ANSWER KEY

OC RO NRC Exam

Answer: A

Answer Explanation		
QID: 11-1 NRO 24		
Question #	24	Developer / Date: JJR / 5-14-2012

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
218000 ADS A4.05 - Ability to manually operate and/or monitor in the control room: ADS timer reset				4.2	4.2
Level	RO	Tier	2	Group	1
General References	EOP User's Guide				
Explanation	A is Correct. In order to reset ADS timers following initiation, both ADS timer keylock switches must be placed in the BYPASS position momentarily, then placed back in AUTO. All distractors are Incorrect but plausible if the applicant confuses the steps to RESET ADS following timer initiation (in RPV Control-no ATWS) and the steps to reset ADS logic when all initiating signals are clear (IAW procedure 308). Step 3 in the question stem is required to reset ADS logic IAW 308. Step 1 is plausible if the applicant does not recall how to reset ADS timers or logic. This action is required if an EMRV is open or leaking.				
References to be provided during exam:	None				
Lesson Plan	2621.845.0.0052, RPV Control - no ATWS				
Learning Objective/	ENA-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)	New

EXAMINATION ANSWER KEY

OC RO NRC Exam

If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**N/A**		
Cognitive Level	**Memory or Fundamental Knowledge**	**X** **1:P**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: Procedure steps and cautions			
10CRF55 Content	**55.41b**	**10**	**55.43b**	
	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**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

25 **ID: 11-1 NRO 25** **Points: 1.00**

The Standby Liquid Control System explosive (squib) valves are powered from which of the following sources?

A. 24 / 48 VDC Distribution

B. Safety Related 125 VDC Distribution

C. Vital Motor Control Center (VMCC) Distribution

D. The respective pump Motor Control Center (MCC)

Answer: D

Answer Explanation

QID: 11-1 NRO 25		
Question #	25	Developer / Date: JJR / 5-14-2012

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
211000 SLC K2.02 - Knowledge of electrical power supplies to the following: Explosive valves				3.1	3.2
Level	RO	Tier	2	Group	1
General References	BR 3004 sh. 1				
Explanation	D is Correct. The MCC of the SLCS pump selected for injection provides the 480VAC power for both squib valves for that SLCS train. All distractors are Incorrect but plausible since they are logical sources of power if the applicant does not know the correct power supply.				
References to be provided during exam:	None				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Lesson Plan	**2621.828.0.0046, Standby Liquid Control**
Learning Objective/	**SLC-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)			**Modified**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**N/A** **Peach Bottom ILT Bank** **No**		
Cognitive Level	**Memory or Fundamental Knowledge**	**X** **1:F**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: Facts			
10CRF55 Content	**55.41b**	**7**	**55.43b**	
	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**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

26 **ID: 11-1 NRO 26** **Points: 1.00**

The plant was at rated power when LPRM 28-33A (input to APRM 1) failed resulting in APRM 1 indicating 87.5%. All other LPRMs and APRMs indicate normally.

Which of the following other indications are correct? Assume that the APRM Gain is 1.000.

A. APRM 1 DNSCL OR INOP light will be ON (on Panel 4F) **AND** a rodblock is present.

B. LPRM 28-33A local analog meter on Panel 4F full core display will have a red back-light.

C. LPRM 28-33A amber light on Panel 4F full core display will be OFF **AND** a rodblock is present.

D. LPRM 28-33A local meter on Panel 4F full core display indicates downscale.

Answer: D

Answer Explanation

QID: 11-1 NRO 26		
Question #	**26**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information		
K&A	**Importance Rating**	
	RO	**SRO**
215005 APRM / LPRM K3.05 - Knowledge of the effect that a loss or malfunction of the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM will have on following: Reactor power indication	**3.8**	**3.8**

Level	**RO**	**Tier**	**2**	**Group**	**1**
General References	**RAP-G4f, G7f**				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**D is Correct. APRM 1 will read 100% at full power and will read 87.5 when 1 LPRM goes downscale (700/8) [given the gain is 1.000]. Therefore, the LPRM has failed downscale. When the LPRM fail downscale, several things happen: the associated APRM produces a rodblock; the amber light (on full core display) goes ON; the APRM reading goes down; and, the local reactor power meter of the full core display (individual LPRM readings) will go downscale. Therefore, there will be a rod block and the local meter will read downscale.** **A is Incorrect but plausible. The APRM will neither be INOP nor downscale.** **B is Incorrect but plausible. There is no red backlighting for the associated LPRM, the red backlighting on control rod indications.** **C is Incorrect but plausible. Since the local reactor power indication for the LPRM failed downscale, its amber light will be ON, not OFF.**
References to be provided during exam:	**None**
Lesson Plan	**2621.828.0.0029, Nuclear Instrumentation**
Learning Objective/	**NIS-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)			**Bank**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**609055** **ILT Bank** **No**		
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	**55.41b**	**7**	**55.43b**	

EXAMINATION ANSWER KEY

OC RO NRC Exam

	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**	☒ **Initial License Level** ☐ **LORT**	

EXAMINATION ANSWER KEY

OC RO NRC Exam

27 **ID: 11-1 NRO 27** **Points: 1.00**

The plant was at rated power when a LOCA occurred.

Which of the following states the ***sequence*** of automatic Recirculation Pump **trips** and automatic Isolation Condenser (IC) **initiations** as RPV water level steadily drops from 95" to 82"?

	Occurs First	Occurs Second	Occurs Third
A.	**ALL** Recirculation Pumps Trip	IC condensate return valves open and vent valves close	No other actions
B.	IC condensate return valves open and vent valves close	**A, B, E ONLY** Recirculation Pumps Trip	**C, D** Recirculation Pumps Trip
C.	IC condensate return valves open and vent valves close	**ALL** Recirculation Pumps Trip	No other actions
D.	**A, B, E ONLY** Recirculation Pumps Trip	IC condensate return valves open and vent valves close	**C, D** Recirculation Pumps Trip

Answer: A

Answer Explanation		
QID: 11-1 NRO 27		
Question #	**27**	**Developer / Date: JJR / 5-14-2012**

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

EXAMINATION ANSWER KEY

OC RO NRC Exam

216000 Nuclear Boiler Inst. K1.15 - Knowledge of the physical connections and/or cause- effect relationships between NUCLEAR BOILER INSTRUMENTATION and the following: Isolation condenser: Plant-Specific				**3.9**	**4.1**
Level	**RO**	**Tier**	**2**	**Group**	**2**
General References	**RAP-C1a, C2a**		**BR 3029 sh. 2**		
Explanation	**A is Correct. The isolation condensers auto initiate (after 1.5 seconds) on Nuclear Boiler Instrumentation signals from either a lo-lo RPV water level (90") or RPV high pressure (1051 psig). Recirculation pumps also trip from the same parameters. On lo-lo water level, all recirculation pumps trip immediately. On high pressure, recirculation pumps A, B & E trip immediately, and pumps C & D trip after sustained high pressure of 10.5 seconds. Therefore, as RPV water level lowers through the lo-lo setpoint, all recirculation pumps trip and the ICs initiate after a time delay of 1.5 seconds. All distractors are Incorrect but plausible since they occur but in they're in the incorrect sequence or the applicant may confuse the RPV high pressure and Lo-Lo water level sequence.**					
References to be provided during exam:	**None**				
Lesson Plan	**2621.828.0.0023, Isolation Condensers**				
Learning Objective/	**ICS-2030, Describe the Isolation Condenser design features and/or interlocks which provide for the following: automatic system initiation and isolation**				

Question Source (New, Modified, Bank)			**Bank**	
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:	**666839 ILT Bank No**			
Cognitive Level	**Memory or Fundamental Knowledge**		**Comprehension or Analysis**	**X 2:DR**

EXAMINATION ANSWER KEY

OC RO NRC Exam

	NUREG 1021 Appendix B: Describing or recognizing Relationships			
10CRF55 Content	**55.41b**	**7**	**55.43b**	
	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**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

28 **ID: 11-1 NRO 28** **Points: 1.00**

The plant was at rated power when a reactor scram occurred.

Which **ONE** of the following correctly describes the electrical power supplies to the Condensate Pumps five minutes after the reactor scram?

	Condensate Pump A	Condensate Pump B	Condensate Pump C
A.	Transformer 1A via Bus 1A	Transformer 1A via Bus 1A	Transformer 1B via Bus 1B
B.	Transformer 1A via Bus 1A	Transformer 1B via Bus 1B	Transformer 1B via Bus 1B
C.	Transformer S1A via Bus 1A	Transformer S1A via Bus 1A	Transformer S1B via Bus 1B
D.	Transformer S1A via Bus 1A	Transformer S1B via Bus 1B	Transformer S1B via Bus 1B

Answer: D

Answer Explanation		
QID: 11-1 NRO 28		
Question #	**28**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
256000 Reactor Condensate K2.01 - Knowledge of electrical power supplies to the following: System pumps				**2.7**	**2.8**
Level	**RO**	**Tier**	**2**	**Group**	**2**
General References	**BR 3001A**		**BR 3001B**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	D is Correct. The power supply to Condensate Pump A is 4160VAC Bus 1A and the power supply to Condensate Pumps B & C is 4160VAC Bus 1B. When shutdown (post-scram), these buses are powered from the Startup Transformers S1A and S1B respectively (offsite power). The startup transformer breakers automatically close when the Main Turbine trips. The Main Turbine will trip immediately following the scram. All distractors are Incorrect but plausible if the applicant confuses either the transformer labels, when the startup transformers pick up power to the 4160VAC buses, or they do not recall which bus Condensate Pump B is powered from since one bus powers two pumps.
References to be provided during exam:	None
Lesson Plan Learning Objective/	2621.828.0.0017, Feed and Condensate System CNS-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: Previous 2 Exams:			N/A	
Cognitive Level	Memory or Fundamental Knowledge	X 1:I	Comprehension or Analysis	
	NUREG 1021 Appendix B: Interlocks, setpoints, or system (singular) response			
10CRF55 Content	55.41b	7	55.43b	
	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

OC RO NRC Exam

Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	**256000**	**PRA:**	**No**
Safety Function:	**2**	☒ **Initial License Level** ☐ **LORT**	

EXAMINATION ANSWER KEY

OC RO NRC Exam

29 **ID: 11-1 NRO 29** **Points: 1.00**

A plant shutdown is in progress due to the loss of 125 VDC Bus C, when a catastrophic loss of instrument air occurred.

TWO MINUTES LATER, the URO observes the following:

- INSTR AIR SUPPLY indicates 0 psig
- RPV pressure currently indicates 1100 psig and steady
- APRMs indicate >2%
- 230 KV Breakers GD1 and GC1 indicate **GREEN** lights **ON**

In reference to RPV Pressure control, which of the following are correct for the above conditions? (assume **NO** operator action had been taken)

1. **ALL** Turbine Bypass Valves are OPEN
2. **ALL** EMRVs are OPEN
3. **ONLY** 3 EMRVs are OPEN
4. **BOTH** Isolation Condensers are in service
5. **SOME** SRVs are OPEN

A. 2 **ONLY**

B. 3 and 4 **ONLY**

C. 3 and 5 **ONLY**

D. 1, 2, and 4 **ONLY**

Answer: A

Answer Explanation		
QID: 11-1 NRO 29		
Question #	**29**	**Developer / Date: JJR / 5-14-2012**

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

EXAMINATION ANSWER KEY

OC RO NRC Exam

Level	RO	Tier	2	Group	2
General References	RAP-B4g RAP-C1a		GE 729E182		EB D-3033

Explanation	**This question examines how the EMRVs will respond to a loss of the Main Steam System (MSIV Closure).** **The plant is at power with the loss of 125 VDC Bus C. With this loss, 125 VDC Busses DC-F and DC-2 are also lost.** **All EMRVs receive 2 DC power supplies (DC-D and DCF), such that the loss of 1 DC power supply will not prevent any EMRV from functioning. Therefore, all EMRVs can operate normally.** **Each Isolation Condenser has a normally closed condensate return valve, which are DC powered: IC-A valve receives power from DC-1 and IC-B receives power from DC-2 which is powered from DC-C. With the loss of DC power, then IC-B condensate return valve cannot open, but IC-A is fully operable.** **With the loss of all instrument air, the outboard MSIVs will auto close, which prevents operation of the Turbine Bypass Valves.** **The EMRVs open under an ADS signal or from RPV high pressure (some open at 1065 psig and the others open at 1085 psig). Since RPV pressure is 1100 psig and steady, and since all EMRVs are fully functional, then all EMRVs are currently open and indicate in the VALVE OPEN REGION.** **The RPV safety valves open under RPV high pressure (initial opening at 1212 psig). Since RPV pressure is only 1100 psig, then no SRVs have opened.** **Isolation Condensers initiate on lo-lo RPV water level and from RPV high pressure (sustained 1051 psig) and are therefore in service, except that IC-B condensate return valve is closed with no electrical power. Thus, only IC-A is in service.** **Choice 1 is false since the TBV are closed.** **Choice 2 is true since all EMRVs have opened due to RPV high pressure.** **Choice 3 is false since all EMRVs have opened due to RPV high pressure.** **Choice 4 is false since IC-B is not in-service (but is true for ONLY IC-A).** **Choice 5 is false since the SRV lift setpoint has not been reached.** **Therefore, Answer A (Choice 2 ONLY) is Correct.**

EXAMINATION ANSWER KEY

OC RO NRC Exam

References to be provided during exam:	None	
Lesson Plan	2621.828.0.023 Isolation Condensers	
Learning Objective/	ICS-2338, Given plant conditions, evaluate the impact on the Isolation Condenser System and the plant.	

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified VISION System/Question ID: Question Source: Previous 2 Exams:	811719 ILT Bank No			
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	55.41b	7	55.43b	
	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:	4	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC RO NRC Exam

30 **ID: 11-1 NRO 30** **Points: 1.00**

The plant is at rated power.

Which of the following annunciators/indications by themselves, indicate that an automatic protective action has occurred or will occur to mitigate an offsite radiological release?

A. **BOTH** Offgas Radiation Monitors indicate upscale.

B. Service Water Discharge Radiation Monitor indicates upscale.

C. Spent Fuel Pool Area radiation monitor C5 indicates upscale.

D. **BOTH** Stack RAGEMS noble gas effluent monitors indicate upscale.

Answer: A

Answer Explanation

QID: 11-1 NRO 30		
Question #	**30**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
272000 Radiation Monitoring K4.01 - Knowledge of RADIATION MONITORING System design feature(s) and/or interlocks which provide for the following: Redundancy				**2.7**	**2.8**
Level	**RO**	**Tier**	**2**	**Group**	**2**
General References	**RAP-10F1c**				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**A is Correct. RAP-10F1c (answer a) states the automatic actions for this alarm (OFFGAS HI-HI): Closure of V-7-31 [AOG Bypass Valve], V-7-29 [48" hold-up drain valve] and OG-AOV-001A (001B) [Recombiner inlet valves] to isolate the off gas system at the stack and trip the mechanical vacuum pump (if running) after a 15 +0 -1 (14 to 15) minute time delay with coincident upscale trip of both channels, or an upscale trip in 1 channel and downscale trip in the other channel (redundancy required to actuate the automatic interlock). The mechanical vacuum pumps are not in service given the plant conditions. With both offgas rad monitors upscale, the offgas system will be isolated from the stack after 15 minutes. The expected annunciator prior to this Hi-Hi alarm (Offgas Hi 10F2c) has no protective functions.** **B is Incorrect but plausible. Service Water Discharge Radiation Monitor has no automatic actions.** **C is Incorrect but plausible. Fuel pool area radiation monitors B9 and C9 will isolate RB HVAC and initiate SGT when either rad monitor goes high. Area rad monitor C5, in the same vicinity, only produces a control room alarm (RAP-F1k).** **D is Incorrect but plausible. There are no protective functions from upscale stack RAGEMS.**
References to be provided during exam:	**None**
Lesson Plan	**2621.828.0.033A, Plant Radiation Monitoring System**
Learning Objective/	**RAD-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:	**510682**
Question Source:	**ILT Bank**
Previous 2 Exams:	**No**

EXAMINATION ANSWER KEY

OC RO NRC 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	**55.41b**	**7**	**55.43b**	
	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.:	**272000**	**PRA:**	**No**	
Safety Function:	**9**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

31 **ID: 11-1 NRO 31** **Points: 1.00**

A reactor shutdown is in progress with reactor power at 8%. The currently latched group of 8 rods has an insert limit of 28 and a withdraw limit of 32. This group's rods are at the following positions:

- 2 rods are at 26
- 4 rods are at 32
- 1 rod is at 34
- 1 rod is at 28, and **selected**

Which of the following statements is correct concerning the RWM status?

A. 3 INSERT ERRORS exist **AND** an INSERT BLOCK is applied to **ALL** control rods.

B. The RWM must be bypassed since it would not have allowed this configuration.

C. 2 INSERT ERRORS exist **AND** a WITHDRAW BLOCK is applied to **ALL** control rods.

D. 1 WITHDRAW ERROR exists **AND** a WITHDRAW BLOCK is applied to **SOME** control rods.

Answer: C

Answer Explanation

QID: 11-1 NRO 31		
Question #	**31**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information		
K&A	**Importance Rating**	
	RO	**SRO**
201006 RWM K5.12 - Knowledge of ROD WORTH MINIMIZER SYSTEM (RWM) (PLANT SPECIFIC) design feature(s) and/or interlocks which provide for the following: Withdraw block	**3.5**	**3.5**

Level	**RO**	**Tier**	**2**	**Group**	**2**

EXAMINATION ANSWER KEY

OC RO NRC Exam

General References	**409**	**VM-RW-1312**	
Explanation	**C is Correct. There are two insert errors (the two rods at 26) and there is a withdraw block due to the rod at 34, which is applied to all control rods.** **A is Incorrect but plausible. There are only two insert errors; the two rods at 26. There is an insert block, however, since the rod that is withdrawn past its withdraw limit is not selected.** **B is Incorrect but plausible if the applicant does not recall RWM operations since it would have allowed the given configuration.** **D is Incorrect but plausible. There is a withdraw error, but the withdraw block would be applied to all control rods since the withdraw error rod is not selected.**		
References to be provided during exam:	**None**		
Lesson Plan **Learning Objective/**	**2621.828.0.0041, Rod Worth Minimizer** **RWM-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)			**Bank**	
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:	**506426 ILT Bank No**			
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			

EXAMINATION ANSWER KEY

OC RO NRC Exam

10CRF55 Content	55.41b	7	55.43b	
	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.:	201006	PRA:	No	
Safety Function:	7	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC RO NRC Exam

32 **ID: 11-1 NRO 32** **Points: 1.00**

The plant is at rated power. An event then occurs resulting in a loss of USS 1B2.

Which of the following will lose power from this event?

A. Reactor Feed Pump 'C' Aux Oil Pump, P-2-9C.

B. Control Room Master Fire Alarm Panels A and B.

C. The 'C' Reactor Recirc Pump Discharge Valve, V-37-32.

D. Panel ER-42 (Screen Wash Control Panel) normal power.

Answer: B

Answer Explanation

QID: 11-1 NRO 32		
Question #	**32**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information		
K&A	**Importance Rating**	
	RO	**SRO**
286000 Fire Protection K6.01 - Knowledge of the effect that a loss or malfunction of the following will have on the FIRE PROTECTION SYSTEM: A. C. electrical distribution: Plant-Specific	**3.1**	**3.1**

Level	**RO**	**Tier**	**2**	**Group**	**2**
General References	**ABN-48**				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**B is Correct. USS 1B2 powers the Control Room Master Fire Alarm Panels A and B. This will cause the Control Room to lose its ability to detect fires from those panels in the Main Control Room.** **All distractors are incorrect but plausible if the applicant does not recall the correct power supply to the CR Fire Alarm Panels. None of the other choices are powered from USS-1B2.**
References to be provided during exam:	**None**
Lesson Plan	**2621.828.0.0019, Fire Protection**
Learning Objective/	**FPS-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)			**New**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**N/A**		
Cognitive Level	**Memory or Fundamental Knowledge**	**X** **1:F**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: Facts			
10CRF55 Content	**55.41b**	**7**	**55.43b**	
	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.:	**286000**	**PRA:**	**No**	

EXAMINATION ANSWER KEY

OC RO NRC Exam

Safety Function:	**8**	☒ **Initial License Level** ☐ **LORT**

EXAMINATION ANSWER KEY

OC RO NRC Exam

33 **ID: 11-1 NRO 33** **Points: 1.00**

The plant is at rated power. Plant conditions include the following:

- STANDBY GAS SELECT switch is in the SYS 2 position

An event then occurred which automatically initiated the Standby Gas Treatment System (SGTS).

Five (5) minutes after the SGTS initiation, with no operator action, which of the following is the correct fan/valve configuration if the lead system developed/maintained a low flow signal?

	SGTS 1 Fan	SGTS 2 Fan	SGTS 2 Orifice Valve V-28-28
A.	ON	ON	OPEN
B.	ON	OFF	CLOSED
C.	OFF	ON	CLOSED
D.	ON	OFF	OPEN

Answer: A

Answer Explanation		
QID: 11-1 NRO 33		
Question #	33	Developer / Date: JJR / 5-14-2012

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
290001 Secondary CTMT A1.01 - Ability to predict and/or monitor changes in parameters associated with operating the SECONDARY CONTAINMENT controls including: System lineups				3.1	3.1
Level	RO	Tier	2	Group	2

EXAMINATION ANSWER KEY

OC RO NRC Exam

General References	**330**	**RAP-L5b**	
Explanation	**A is Correct. On an automatic system initiation, both SGTS fans start. If the lead fan develops adequate flow within the first 2-3 minutes, the lag fan will shutdown and the associated inlet/outlet valves close. If the lead fan does not develop adequate flow, the lag fan continues and the lead fan continues to run, but with the lead system inlet/outlet valves closed. The system orifice valves are normally closed (with the systems in standby) and stays closed when the lead system starts with proper flow. If the lead running system sees low flow, then besides what's already been said, the lead system orifice valve also opens (and inlet/outlet valves close and the redundant system assumes the SGTS function). Therefore, 5 minutes after an auto initiation, system 2 fan (which was selected as lead) will be running with the loop inlet/outlet valves closed and loop orifice valve open. System 1 fan is also running performing the SGTS function.** **All distractors are Incorrect but plausible if the applicant does not recognize the correct fan/valve lineup for the stated conditions.**		
References to be provided during exam:	**None**		
Lesson Plan	**2621.828.0.0042, Secondary Containment & SGTS**		
Learning Objective/	**SGT-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:	**510845**
Question Source:	**ILT Bank**
Previous 2 Exams:	**No**

EXAMINATION ANSWER KEY

OC RO NRC Exam

Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:PEO
	NUREG 1021 Appendix B: Predict an Event or Outcome			
10CRF55 Content	55.41b	7	55.43b	
	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.:	290001	PRA:	No	
Safety Function:	5	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC RO NRC Exam

34 **ID: 11-1 NRO 34** **Points: 1.00**

The plant is shutdown for a refuel outage. Plant conditions include the following:

- The 'B' Fuel Pool Cooling (FPC) pump is in service
- The 'B' Shutdown Cooling (SDC) loop is in service
- TBCCW Pumps 1 and 2 are in service

An event then occurred resulting in a loss of MCC 1A21.

Based on the conditions above, which of the following correctly states the plant impact **AND** the required action for this event?

	Plant Impact	**Action**
	Loss of...	**Refer to AND/OR Perform Actions Required by...**
A.	the 'B' SDC Loop	ABN-3, Loss of Shutdown Cooling
B.	the 'B' FPC Pump	ABN-16, Loss of Fuel Pool Cooling
C.	TBCCW Pumps 1 & 2	ABN-20, Loss of TBCCW
D.	power to the Refueling Bridge	ABN-45, Loss of USS 1A2

Answer: D

Answer Explanation		
QID: 11-1 NRO 34		
Question #	**34**	**Developer / Date: JJR / 5-14-2012**

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

EXAMINATION ANSWER KEY

OC RO NRC Exam

234000 Fuel Handling Equipment A2.03 - Ability to (a) predict the impacts of the following on the FUEL HANDLING EQUIPMENT ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of electrical power				**2.8**	**3.1**
Level	**RO**	**Tier**	**2**	**Group**	**2**
General References	**205.0**		**ABN-45**		
Explanation	**D is Correct. The power supply to the Refuel Bridge is MCC 1A21. The correct action is to restore power to the refuel bridge. Of the choices listed the operators will refer to ABN-48, Loss of USS 1A2. In ABN-48, the operator will also determine the extent of condition by referring to the load lists in the back of the ABN. All loads off of MCC 1A21, 1A21A, and 1A21B are listed. All distractors are Incorrect but plausible if the applicant does not recall the loads that were lost when MCC 1A21 de-energized. Each ABN is the correct ABN for the loss stated in each distractor.**				
References to be provided during exam:	**None**				
Lesson Plan Learning Objective/	**2621.812.0.0003, Refueling RFL-00291, Describe the Refueling Platform major components location, function and power supply.**				

Question Source (New, Modified, Bank)	**New**
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:	**N/A**

EXAMINATION ANSWER KEY

OC RO NRC Exam

Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:PEO
	NUREG 1021 Appendix B: Predict an Event or Outcome			
10CRF55 Content	55.41b	10	55.43b	
	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.:	234000	PRA:	No	
Safety Function:	8	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC RO NRC Exam

35 **ID: 11-1 NRO 35** **Points: 1.00**

Which of the following could be indicative of a Reactor Manual Control System control rod movement timer malfunction?

A. The red WITHDRAW light ON for 3 seconds during a control rod ROD OUT NOTCH.

B. The green INSERT light ON for 3.5 seconds during a control rod single notch ROD IN.

C. The amber SETTLE light ON for 5 seconds following a control rod single notch ROD IN evolution

D. The green INSERT light ON for 1 second during a control rod ROD OUT NOTCH.

Answer: A

Answer Explanation		
QID: 11-1 NRO 35		
Question #	**35**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
201002 RMCS A3.02 - Ability to monitor automatic operations of the REACTOR MANUAL CONTROL SYSTEM including: Rod movement sequence lights				**2.8**	**2.7**
Level	**RO**	**Tier**	**2**	**Group**	**2**
General References	**ABN-6**		**302.2**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**A is Correct. IAW 302.2, the red WITHDRAWAL light is illuminated approximately 2 seconds following switch movement and remains on for approximately 1.5 seconds. Since it is on for 3 seconds, this could indicate a timer malfunction and actions of ABN-6 should be taken.** **All distractors are Incorrect but plausible. All conditions described in the distractors are expected indications for rod movement.**
References to be provided during exam:	**None**
Lesson Plan **Learning Objective/**	**2621.828.0.0036, Reactor Manual Control System** **RMC-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:** **Previous 2 Exams:**		**510850** **ILT Bank** **No**		
Cognitive Level	**Memory or Fundamental Knowledge**	**X** **1:F**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: Facts			
10CRF55 Content	**55.41b**	**7**	**55.43b**	
	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.:	**201002**	**PRA:**	**No**	

EXAMINATION ANSWER KEY

OC RO NRC Exam

Safety Function:	1	☒ Initial License Level ☐ LORT

EXAMINATION ANSWER KEY

OC RO NRC Exam

36 **ID: 11-1 NRO 36** **Points: 1.00**

The plant was at rated power when an Off-Gas Deflagration occurred.

IAW ABN-25, Off-Gas Deflagration, which of the following combinations of alarms are required to be cleared before the Off-Gas system can be reset?

1. OFF GAS ISOL ACT I
2. OFF GAS ISOL ACT II
3. OFF GAS PRESS HI
4. OFF GAS TEMP HI

A. 1 and 2 **ONLY**

B. 3 and 4 **ONLY**

C. 1, 2, and 4 **ONLY**

D. 1, 2, 3, and 4

Answer: B

Answer Explanation

QID: 11-1 NRO 36		
Question #	**36**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
271000 Off-gas A4.01 - Ability to manually operate and/or monitor in the control room: Reset system isolations				**2.8**	**2.8**
Level	**RO**	**Tier**	**2**	**Group**	**2**
General References	**ABN-25**				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	B is Correct. IAW ABN-25, the OFF GAS PRESS HI and OFF GAS TEMP HI alarms are required to be clear before continuing to reset the Off-Gas isolation logic. All distractors are Incorrect but plausible since they all initiate following an Off-gas deflagration. The applicant may not recall what alarms clear or what alarms are required to be clear for this event.
References to be provided during exam:	None
Lesson Plan Learning Objective/	2621.845.0.0053, RPV Control - with ATWS 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)			New	
If Bank or Modified VISION System/Question ID: Question Source: Previous 2 Exams:		N/A		
Cognitive Level	Memory or Fundamental Knowledge	X 1:P	Comprehension or Analysis	
	NUREG 1021 Appendix B: Procedure steps and cautions			
10CRF55 Content	55.41b	10	55.43b	
	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.:	271000	PRA:	No	

EXAMINATION ANSWER KEY

OC RO NRC Exam

Safety Function:	**9**	☒ **Initial License Level** ☐ **LORT**

EXAMINATION ANSWER KEY

OC RO NRC Exam

37 **ID: 11-1 NRO 37** **Points: 1.00**

The plant was at rated power. The Operator had just placed TIP 1 and 2 at the core top location, when the following annunciators alarmed:

- DW PRESS HI-HI RV46 A/B
- DW PRESS HI-HI RV46 C/D

12 minutes later, the Operator reports the following observations:

- TIP CHANNEL 1
  - IN SHIELD white light is energized
  - DETECTOR POSITION displays 02
- TIP CHANNEL 2
  - IN SHIELD white light is de-energized
  - DETECTOR POSITION displays 255
- The TIP red light (Panel 11F) is energized
- **NO** TIPs can be moved

IAW 405.2, Operation of the TIP System, which of the following states the required action for the stated conditions?

A. Manually retract TIP 1 locally

B. Fire the shear valve for TIP 1

C. Manually retract TIP 2 locally

D. Fire the shear valve for TIP 2

Answer: D

Answer Explanation		
QID: 11-1 NRO 37		
Question #	**37**	**Developer / Date: JJR / 5-14-2012**

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

EXAMINATION ANSWER KEY

OC RO NRC Exam

215001 Traversing In-core Probe 2.1.23 - Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.				4.3	4.4
Level	RO	Tier	2	Group	2
General References	405.2		RAP-C1f, C2f		
Explanation	D is Correct. The plant is at power with TIPs 1 & 2 at the core top. The provided annunciators show that a LOCA signal has been generated (3 psig Drywell pressure or RPV water level at or below 86"). These signals also isolate the Primary Containment and RPV, including the TIPs. On an isolation, the TIPs automatically retract and the ball valves close. Conditions show that with the Panel 11F TIP red light on, then at least one TIP ball valve is open. It also shows that the in shield light for TIP 2 is de-energized, which means that the TIP 2 has not retracted to the in shield position and the ball valve will be open. The ball valve normally auto closes when the TIP is retracted into the shield. The TIP 2 detector position (lowest is in shield and counts up as the detector moves out of the shield) shows that it is not in shield. IAW the 405.2, with a ball valve open and cannot be closed, then it directs that the shear valve be fired for the applicable TIP. A & C are Incorrect but plausible since the TIPs can be manually cranked locally, however 405.2 directs actuating the shear valve for this condition. Choice A also specifies the wrong TIP. B is Incorrect but plausible if the applicant is confused about which TIP retracted.. It is not the correct TIP.				
References to be provided during exam:	None				
Lesson Plan Learning Objective/	2621.828.0.0029, Nuclear Instrumentation NIS-10445, 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)	Modified

EXAMINATION ANSWER KEY

OC RO NRC Exam

If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**718311** **ILT Bank** **No**		
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	**55.41b**	**10**	**55.43b**	
	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.:	**215001**	**PRA:**	**No**	
Safety Function:	**7**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

38 **ID: 11-1 NRO 38** **Points: 1.00**

Given the following plant conditions:

- The plant is at 100% power
- The Electric Pressure Regulator (EPR) pressure transmitter fails, the EPR relay position strokes to the 0 % position.
- No operator actions have yet occurred

Based on these plant conditions, which one of the following parameters will **initially** lower?

A. Reactor Power

B. Generator Output

C. Reactor Pressure Vessel Pressure

D. Mechanical Pressure Regulator Relay Position

Answer: B

Answer Explanation		
QID: 11-1 NRO 38		
Question #	**38**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information		
K&A	**Importance Rating**	
	RO	**SRO**
245000 Main Turbine Gen. / Aux. K1.08 - Knowledge of the physical connections and/or cause- effect relationships between MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS and the following: Reactor/turbine pressure control system: Plant-Specific	**3.4**	**3.5**

Level	**RO**	**Tier**	**2**	**Group**	**2**
General References	**Turbine Tech Manual Tab 10**		**GE 223R309**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**B is Correct. If a loss of power occurs to the EPR, the actual relay position and setpoint indicators go downscale; The MPR takes control and regulates at a higher RPV pressure of 1024 psig. This causes the TCVs to close resulting in a loss of generator load initially because less steam is going to the turbine thus dropping generator load.** **A is Incorrect but plausible if the applicant doesn't recall how the Turbine Control System responds to a loss of the EPR. Reactor power will increase.** **C is Incorrect but plausible if the applicant doesn't recall how the Turbine Control System responds to a loss of the EPR. Initial RPV pressure will rise.** **D is Incorrect but plausible if the applicant doesn't recall how the Turbine Control System responds to a loss of the EPR. The MPR relay will rise as the EPR relay lowers.**
References to be provided during exam:	**None**
Lesson Plan	**2621.828.0.0051, Turbine Control System**
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:** **Question Source:** **Previous 2 Exams:**	**607955** **ILT Bank** **No**			
Cognitive Level	**Memory or Fundamental Knowledge**		**Comprehension or Analysis**	**X** **3:PEO**
	NUREG 1021 Appendix B: Predict an Event or Outcome			

EXAMINATION ANSWER KEY

OC RO NRC Exam

10CRF55 Content	55.41b	7	55.43b	
	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.:	245000	PRA:	No	
Safety Function:	4	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC RO NRC Exam

39 **ID: 11-1 NRO 39** **Points: 1.00**

The plant is shutdown and cooling down with the Shutdown Cooling System (SDC).

The following plant conditions currently exist:

- All Recirculation Pumps are in service
- Shutdown Cooling Pumps B and C are in-service with a total SDC System flow of 6000 GPM
- SDC Pump A is tagged out of service due to an oil leak
- RPV water level indicates 160"
- RECIRC PUMP SUCTION TEMPS indicate 197 °F

The following annunciators then alarmed:

- 1B2 MN BRKR TRIP
- 1B2 MN BRKR OL TRIP

The Operator reports that RECIRC PUMP SUCTION TEMPS are rising. Which of the following states the required action to provide adequate core cooling for the given conditions?

A. Raise RPV water level up to at least 170".

B. Bypass the SDC isolation and restart the SDC System.

C. Establish alternate RPV cooldown with the RWCU System.

D. Initiate the Isolation Condensers IAW 307, Isolation Condenser System.

Answer: C

Answer Explanation

QID: 11-1 NRO 39		
Question #	**39**	**Developer / Date: JJR / 5-14-2012**

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

EXAMINATION ANSWER KEY

OC RO NRC Exam

295021 Loss of Shutdown Cooling / 4 AK1.03 - Knowledge of the operational implications of the following concepts as they apply to LOSS OF SHUTDOWN COOLING : Adequate core cooling				3.9	3.9
Level	**RO**	**Tier**	**1**	**Group**	**1**
General References	**ABN-3**				
Explanation	**C is Correct. The plant is shutdown and cooling down with SDC pumps B and C. The provided alarms show a loss of 480 volt USS 1B2, which is providing power to SDC pumps B and C. SDC A is tagged out due to an oil leak and is not available. Therefore, these conditions present a total loss of SDC. IAW ABN-3, Loss of Shutdown Cooling, is SDC is lost, then restore cooling IAW attachment ABN-3-3. Of the methods listed while in cold shutdown, aligning alternate cooling with RWCU is allowed and is available.** **A is Incorrect but plausible. ABN-3 states that SDC is isolated, then raise RPV water level >185" to establish circulation flow through the steam separators.** **B is Incorrect but plausible. The indications show a bus over load and loss of power to the SDC pumps. Even if a SDC isolation were to occur, bypassing the isolation would still not result in forced flow from SDC.** **D is Incorrect but plausible. Initiating the ICs is listed as an alternate cooldown method IAW ABN-3, but there must be steam in the RPV. With coolant temperature currently at 197 °F, there is no steam to flow through and be condensed by, the ICs.**					
References to be provided during exam:	**ABN-3**				
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.**				

Question Source (New, Modified, Bank)	Bank

EXAMINATION ANSWER KEY

OC RO NRC Exam

If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**616816** **ILT Bank** **No**		
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	**55.41b**	**8**	**55.43b**	
	Components, capacity, and functions of emergency systems.			
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**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

40 **ID: 11-1 NRO 40** **Points: 1.00**

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

- CONT SPRAY FLOWS SYSTEM 1 indicates 4000 GPM
- CONT SPRAY FLOWS SYSTEM 2 indicates 4100 GPM
- Core Spray SYS 1 FLOW indicates 4500 GPM utilizing Core Spray Pumps NZ01A/NZ03A
- Core Spray SYS 2 FLOW indicates 4200 GPM utilizing Core Spray Pumps NZ01B/NZ03B

An event then occurred resulting in Torus Water Level lowering. Torus Water Level has now stabilized. Current plant conditions include the following:

- Torus water level is 102 inches
- Torus pressure is 4.4 psig
- Torus water temperature is 180 °F

Which of the following Core Spray System(s), if any, have exceeded their NPSH limits?

A. None

B. Core Spray System 1

C. Core Spray System 2

D. **BOTH** Core Spray Systems

Answer: B

Answer Explanation		
QID: 11-1 NRO 40		
Question #	**40**	**Developer / Date: JJR / 5-14-2012**

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

EXAMINATION ANSWER KEY

OC RO NRC Exam

295030 Low Suppression Pool Water Level / 5 EK1.02 - Knowledge of the operational implications of the following concepts as they apply to LOW SUPPRESSION POOL WATER LEVEL: Pump NPSH				3.5	3.8
Level	RO	Tier	1	Group	1
General References	EMG-SP4	EOP User's Guide			
Explanation	B is Correct. The question stem describes an event where both Core Spray and Containment Spray Systems are in service to mitigate the events of a LOCA. An event occurs resulting in Torus level lowering (then stabilizing). Due to this event, and IAW EMG-SP4, Core Spray System 1 now does not meet it's NPSH requirements. All distractors are Incorrect but plausible if the applicant does not correctly determine if NPSH has been violated IAW EMG-SP4.				
References to be provided during exam:	EMG-SP4				
Lesson Plan Learning Objective/	2621.845.0.0056, Primary Containment Control 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)			Modified	
If Bank or Modified VISION System/Question ID: Question Source: Previous 2 Exams:	718225 ILT Bank No			
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPR
	NUREG 1021 Appendix B: Solve a Problem using References			
10CRF55 Content	55.41b	10	55.43b	

EXAMINATION ANSWER KEY

OC RO NRC 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.:	**295030**	**PRA:**	**No**
Safety Function:	**5**	☒ **Initial License Level** ☐ **LORT**	

EXAMINATION ANSWER KEY

OC RO NRC Exam

41 **ID: 11-1 NRO 41** **Points: 1.00**

While at the controls during a fuel shuffle, you are notified that an irradiated fuel bundle was dropped while being moved over the core.

Which **ONE** of the following would be an accurate radiation monitoring response from this event, if the design basis release were to occur?

Panel 2R radiation monitor...

A. C5, SPENT FUEL POOL AREA, will indicate elevated radiation levels, and when tripped high, will isolate the DW vent/purge valves (after a time delay).

B. C10, FUEL POOL HI RANGE, will indicate elevated radiation levels, and when tripped high, will initiate the Standby Gas Treatment System (after a time delay).

C. C9, FUEL POOL LOW RANGE, will indicate elevated radiation levels, and when tripped high, will initiate the Standby Gas Treatment System (after a time delay).

D. B9, REACTOR OPEN FLR EQUIP HATCH, will indicate elevated radiation levels, and when tripped high, will isolate the DW vent/purge valves (after a time delay).

Answer: C

Answer Explanation

QID: 11-1 NRO 41		
Question #	**41**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information		
K&A	**Importance Rating**	
	RO	**SRO**
295023 Refueling Acc Cooling Mode / 8 AK1.01 - Knowledge of the operational implications of the following concepts as they apply to REFUELING ACCIDENTS : Radiation exposure hazards	**3.6**	**4.1**

EXAMINATION ANSWER KEY

OC RO NRC Exam

Level	RO	Tier	1	Group	1
General References	RAP-10F3m				
Explanation	C is Correct. The question stem describes an event where an irradiated fuel bundle was dropped over the core. When radiation monitor C9 reaches 50mR/hr, it will trip RB ventilation, and start the Standby Gas Treatment System (SGTS) following a 2-min time delay. A is Incorrect but plausible. It is true that C5 will indicate elevated radiation levels, however it will not trip the DW vent/purge valves. B is Incorrect but plausible. It is true that C10 will indicate elevated radiation levels, however it will trip RB ventilation, and start the Standby Gas Treatment System (SGTS) following a 2-min time delay. D is Incorrect but plausible. When B9 reaches 50mR/hr, it will trip RB ventilation, and start the Standby Gas Treatment System (SGTS) following a 2-min time delay, not isolate the DW vent/purge valves.				
References to be provided during exam:	None				
Lesson Plan	2621.828.0.0033A, Plant Radiation Monitoring System				
Learning Objective/	273-10449, State the function and interpretation of system alarms, alone and in combination, as applicable in accordance with the system RAPS.				

C1? NO ANNUNCIATORS

Question Source (New, Modified, Bank)	Bank
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:	 510828 ILT 05-1 NRC Exam No

EXAMINATION ANSWER KEY

OC 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	55.41b	11	55.43b	
	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.:	295023	PRA:	No	
Safety Function:	8	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC RO NRC Exam

42 **ID: 11-1 NRO 42** **Points: 1.00**

The plant is at rated power. The Fire Protection System lineup is as follows:

- FIRE SYSTEM POND PUMP 1 is in AUTO
- FIRE SYSTEM POND PUMP 2 is in MANUAL
- FIRE SYSTEM DIESEL PUMP 1 is in AUTO
- FIRE SYSTEM DIESEL PUMP 2 is in AUTO

The following annunciators then alarmed:

- XFMR/TURB AREA FIRE
- LFAP 2 FLOW ALARM

If the fire system header pressure dropped to 60 psig, which of the following states the status of the Diesel Pumps and Pond Pumps?

	Fire Pond Pumps	Fire Diesel Pumps
A.	**NO** pumps operating	**BOTH** pumps operating
B.	**BOTH** pumps operating	**BOTH** pumps operating
C.	**NO** pumps operating	Diesel pump 1 operating **ONLY**
D.	**BOTH** pumps operating	Diesel pump 2 operating **ONLY**

Answer: A

Answer Explanation

QID: 11-1 NRO 42		
Question #	**42**	**Developer / Date: JJR / 5-14-2012**

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

EXAMINATION ANSWER KEY

OC RO NRC Exam

600000 Plant Fire On-site / 8 AK2.03 - Knowledge of the interrelations between PLANT FIRE ON SITE and the following: Motors				2.5	2.6
Level	RO	Tier	1	Group	1
General References	333		RAP-N2a, N2b		RAP-MFAP A(7-c)
Explanation	A is Correct. The question stem describes an event where a fire erupted in the area of the Main Transformer. In addition, fire header pressure dropped to 60 psig. Diesel Fire pump 2 will auto start on fire header low pressure at 85 +/- 10 psig. Diesel Fire pump 2 will auto start on fire header pressure at 75 +/- 10 psig. At 60 psig, both Diesel Fire pumps should have started and will be operating. Either Diesel Fire pump starting will trip the operating Fire Pond pump and also prevent the Pond pump in AUTO from starting therefore neither Pond pump will be operating at 60 psig. B is Incorrect but plausible. Neither Pond pump will be operating. C is Incorrect but plausible. Diesel pump 2 will be operating, not just Diesel pump 1. D is Incorrect but plausible. Neither Pond pump will be operating. Diesel pump 1 will be operating, not just Diesel pump 2.				
References to be provided during exam:	None				
Lesson Plan Learning Objective/	2621.828.0.030, Nuclear Steam Supply System NIS-1029, Given a drawing of the NSSS, trace the flowpaths and locate the major components associated with the system, and explain its operation within the system.				

Question Source (New, Modified, Bank)	Modified
If Bank or Modified VISION System/Question ID: Question Source: Previous 2 Exams:	 811698 ILT Bank No

EXAMINATION ANSWER KEY

OC RO 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	**55.41b**	**7**	**55.43b**	
	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.:	**600000**	**PRA:**	**No**	
Safety Function:	**8**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

43 **ID: 11-1 NRO 43** **Points: 1.00**

Given the following:

- The reactor is operating at 100% power when a turbine trip occurs
- Reactor pressure spikes to 1061 psig for 3 seconds and then lowers to 1015 psig

Which one of the following describes reactor recirculation pump status following this event?

A. **All** recirc pumps are running

B. **No** recirc pumps are running

C. **ONLY** recirc pumps C and D are running

D. **ONLY** recirc pumps A, B and E are running

Answer: C

Answer Explanation

QID: 11-1 NRO 43		
Question #	**43**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
295025 High Reactor Pressure / 3 EK2.04 - Knowledge of the interrelations between HIGH REACTOR PRESSURE and the following: ARI/RPT/ATWS: Plant-Specific				**3.9**	**4.1**
Level	**RO**	**Tier**	**1**	**Group**	**1**
General References	**RAP-E1a**	**420**			

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	C is Correct. Reactor recirc pumps A, B and E trip at 1051 psig (for 1.5 seconds) (ATWS high pressure trip); recirc pumps C and D trip if reactor pressure exceeds 1051 psig for 10.5 seconds. For the given conditions, reactor pressure would not have exceeded 1051 psig for 10.5 seconds. Therefore, A, B and E pumps are tripped; C and D pumps are running. All distractors are Incorrect but plausible if the applicant does not recall the Recirc Pump ATWS logic or recognize this logic initiated.
References to be provided during exam:	None
Lesson Plan	2621.828.0.0038, Reactor Recirculation System
Learning Objective/	RRS-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)			Bank	
If Bank or Modified VISION System/Question ID: Question Source: Previous 2 Exams:	506355 ILT Bank No			
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:PEO
	NUREG 1021 Appendix B: Predict an Event or Outcome			
10CRF55 Content	55.41b	7	55.43b	
	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.:	295025	PRA:	No	

EXAMINATION ANSWER KEY

OC RO NRC Exam

Safety Function:	**3**	☒ **Initial License Level** ☐ **LORT**

EXAMINATION ANSWER KEY

OC RO NRC Exam

44 **ID: 11-1 NRO 44** **Points: 1.00**

The reactor was at rated power, when the following annunciators alarmed:

- REACTOR PRESS - RX PRESS HI-HI I
- REACTOR PRESS - RX PRESS HI-HI II

Which of the following states **(1)** where the Feedwater Control System will control RPV water level in **AUTO** (**PRIOR** to any Operator actions), and **(2)** the procedurally required manual operator actions to control RPV water level?

	(1) The Feedwater Control System will control RPV water level at the...	**(2) Action** **Trip two feedwater pumps when RPV water level...**
A.	pre-scram level setpoint	begins to rise
B.	post-scram level setdown level setpoint	begins to rise
C.	post-scram level setdown level setpoint	reaches 142"
D.	pre-scram level setpoint	reaches 142"

Answer: B

Answer Explanation		
QID: 11-1 NRO 44		
Question #	**44**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
295006 SCRAM / 1 **AK2.02 - Knowledge of the interrelations between SCRAM and the following: Reactor water level control system**				**3.8**	**3.8**
Level	**RO**	**Tier**	**1**	**Group**	**1**

EXAMINATION ANSWER KEY

OC RO NRC Exam

General References	**RAP-H1f**	**ABN-1**	
Explanation	**B is Correct. RAP-H1f and –H2f (RX Press Hi-Hi) will initiate an automatic reactor scram. The operator is required to verify actuation of the post scram level setdown and to perform followup actions of ABN-1. (SP-2 of RPV Control – No ATWS also says the same correct answer.) Following a scram and lowering RPV water level, feedwater level control will attempt to control RPV water level at the reactor level setdown setpoint (142") (when feedwater level control is left in AUTO). ABN-1, Reactor Scram, requires that when RPV water level begins to rise, to trip two feedwater pumps. Then to place the main feed regulating valves in manual and close, them.** **All distractors are Incorrect but plausible. The applicant may not recall if they are required to verify whether the Rx feedwater control system is at the pre or post scram setpoint. In addition, the post scram level setpoint is 142" (the feed control system automatically changes the Master Feedwater Controller setpoint from its initial value to 142"). If the applicant is not familiar with this value they may assume it is the point where they are required to close the Main Feed Reg Valves (which would be logical).**		
References to be provided during exam:	**None**		
Lesson Plan	**2621.828.0.0018, Feedwater Control System**		
Learning Objective/	**FCS-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)	**Modified**
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**	 **667521** **ILT Bank** **No**

EXAMINATION ANSWER KEY

OC 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	55.41b	7	55.43b	
	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.:	295006	PRA:	No	
Safety Function:	1	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC RO NRC Exam

45 **ID: 11-1 NRO 45** **Points: 1.00**

The plant was at rated power when the crew entered ABN-12, Generator Excitation Equipment Malfunction, due to erratic operation of the Voltage Regulator.

(1) IAW ABN-12, which **ONE** of the following conditions would require the crew to scram the reactor? **AND;**
(2) What is the reason for scramming at this time?

A. **(1)** Voltage control **CANNOT** be adjusted below 24.5 KV.
(2) This is above the design operating limit of the voltage regulator.

B. **(1)** Voltage control **CANNOT** be adjusted higher than 23.5 KV.
(2) This is below the design operating limit of the voltage regulator.

C. **(1)** Manual Voltage control failed to correct the voltage instability.
(2) To prevent permanent damage to the voltage regulator.

D. **(1)** Automatic Voltage control cannot be stabilized within 15 minutes.
(2) To prevent permanent damage to the voltage regulator.

Answer: C

Answer Explanation

QID: 11-1 NRO 45		
Question #	**45**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information		
K&A	**Importance Rating**	
	RO	**SRO**
700000 Generator Voltage and Electric Grid Disturbances / 6 AK3.01 - Knowledge of the reasons for the following responses as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: Reactor and turbine trip criteria	**4.6**	**4.6**

Level	RO	Tier	1	Group	1

EXAMINATION ANSWER KEY

OC RO NRC Exam

General References	**ABN-12**	**GEK-5522**	
Explanation	**C is Correct. IAW ABN-12, during periods of erratic voltage regulation, manually scram the reactor if manual voltage control fails to correct the instability. This is to prevent possible permanent damage to the main generator voltage regulator.** **A & B are Incorrect but plausible if the applicant does not recall the normal operating band for voltage regulation (23.3 - 24.7 KV).** **D is Incorrect but plausible if the applicant does not recall when it is required to scram IAW ABN-12. The reason is correct but the requirement to scram is incorrect.**		
References to be provided during exam:	**None**		
Lesson Plan	**2621.828.0.0025, Main Generator**		
Learning Objective/	**GEN-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, EOP & EOP support procedures and EP procedures.**		

Question Source (New, Modified, Bank)			**New**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**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

OC RO NRC Exam

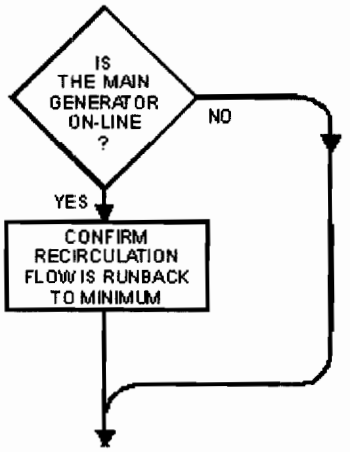
10CRF55 Content	55.41b	10	55.43b	
	Administrative, normal, abnormal, and emergency operating procedures for the facility.			
Justification for LORT questions with K/A values < 3.0	N/A			
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	700000	PRA:	No	
Safety Function:	6	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC RO NRC Exam

46 **ID: 11-1 NRO 46** **Points: 1.00**

The plant was at rated power when an event occurred resulting in an ATWS. Note the EOP step below from RPV Control - with ATWS:



IAW the EOP User's Guide, what is the basis for confirming recirculation flow is runback to minimum if the main generator is on-line?

A. To protect the recirculation pumps from carryunder.

B. To ensure the main turbine doesn't trip on high RPV water level.

C. To reduce recirculation pump power consumption during an emergency condition.

D. To prevent a main turbine runback by proactively reducing recirculation flow and reactor power.

Answer: B

Answer Explanation		
QID: 11-1 NRO 46		
Question #	46	Developer / Date: JJR / 5-14-2012

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

EXAMINATION ANSWER KEY

OC RO NRC Exam

295037 SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown / 1 **EK3.01 - Knowledge of the reasons for the following responses as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN : Recirculation pump trip/runback: Plant-Specific**	**4.1**	**4.2**

Level	**RO**	**Tier**	**1**	**Group**	**1**

General References	**RPVC - with ATWS EOP**	**EOP User's Guide**	
Explanation	**B is Correct. IAW the EOP Users Guide, if the Main Turbine is on-line, the Recirculation pump speeds are reduced prior to tripping them to prevent a large RPV level swell, or moisture separator drain tank level increase which could trip the Main Turbine. The Main Turbine on-line provides the priority heat sink during ATWS conditions.** **All distractors are Incorrect but plausible reasons for reducing recirculation flow if the student does not recall the bases for this action.**		
References to be provided during exam:	**None**		
Lesson Plan	**2621.845.0.0052, RPV Control - no ATWS**		
Learning Objective/	**EWA-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**
<u>If Bank or Modified</u> **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**	 **811734** **ILT Bank** **No**

EXAMINATION ANSWER KEY

OC RO NRC Exam

Cognitive Level	**Memory or Fundamental Knowledge**	**X 1:B**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: Bases or purpose			
10CRF55 Content	**55.41b**	**10**	**55.43b**	
	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.:	**295037**	**PRA:**	**No**	
Safety Function:	**1**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

47 **ID: 11-1 NRO 47** **Points: 1.00**

The plant is at 25% power when an event required entry into ABN-10, Turbine Generator Trip.

IN ORDER, which IMMEDIATE OPERATOR ACTIONS are required by ABN-10, and what is the reason for that specific order?

Confirm the Main __(1)__ is tripped, **then** confirm the Main __(2)__ is tripped. This order will prevent __(3)__.

	(1)	(2)	(3)
A.	Generator	Turbine	overspeeding the Turbine/Generator
B.	Turbine	Generator	overspeeding the Turbine/Generator
C.	Generator	Turbine	motoring the Main Generator
D.	Turbine	Generator	motoring the Main Generator

Answer: D

Answer Explanation		
QID: 11-1 NRO 47		
Question #	**47**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
295005 Main Turbine Generator Trip / 3 AK3.04 - Knowledge of the reasons for the following responses as they apply to MAIN TURBINE GENERATOR TRIP: Main generator trip				**3.2**	**3.2**
Level	**RO**	**Tier**	**1**	**Group**	**1**

EXAMINATION ANSWER KEY

OC RO NRC Exam

General References	GEK-5522	ABN-10	
Explanation	D is Correct. IAW GEK-5522 section GEK-46517, Sequential Tripping and Prevention of Motoring, the reason the Main Generator is tripped immediately following a Main Turbine trip is if the Main Generator didn't immediately (or relatively soon after) the Main Turbine Trip, it will result in motoring the Main Generator and cause rapid heating of the L.P. turbine exhaust hoods and L.P. turbine last stage buckets. The immediate actions of ABN-10 (below 30% power) are to Confirm the Main Turbine is tripped, then Confirm the Main Generator is tripped. All distractors are Incorrect but plausible if the applicant does not recall the order of Immediate Actions of ABN-10 or the reason. Overspeeding is plausible if the applicant believes that the Main Generator motoring would result in maintaining or raising the speed of the Main Turbine/Generator.		
References to be provided during exam:	None		
Lesson Plan Learning Objective/	2621.828.0.0050, Turbine and Turbine Auxiliaries MTA-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	
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:		N/A		
Cognitive Level	Memory or Fundamental Knowledge	X 1:B	Comprehension or Analysis	
	NUREG 1021 Appendix B: <u>B</u>ases or purpose			
10CRF55 Content	55.41b	5	55.43b	

EXAMINATION ANSWER KEY

OC RO NRC Exam

	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.:	**295005**	**PRA:**	**No**
Safety Function:	**3**	☒ **Initial License Level** ☐ **LORT**	

EXAMINATION ANSWER KEY

OC RO NRC Exam

48 **ID: 11-1 NRO 48** **Points: 1.00**

The plant was at rated power when an event resulted in the crew executing ABN-30, Control Room Evacuation. Plant conditions include the following:

- The REACTOR MODE SELECTOR switch is in SHUTDOWN
- Annunciator SCRAM CONTACTOR OPEN is in alarm

IAW ABN-30, which of the following actions are required **BEFORE** evacuating the Control Room?

A. Initiate the "A" Isolation Condenser **AND** start both EDG's.

B. Trip all Reactor Recirculation Pumps **AND** start both EDG's.

C. **CONFIRM** all control rods are inserted to or beyond position 04.

D. Initiate the "B" Isolation Condenser **AND** trip all but one Feed pump.

Answer: C

Answer Explanation

QID: 11-1 NRO 48		
Question #	**48**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
295016 Control Room Abandonment / 7 AA1.03 - Ability to operate and/or monitor the following as they apply to CONTROL ROOM ABANDONMENT : RPIS				**3.0**	**3.1**
Level	**RO**	**Tier**	**1**	**Group**	**1**
General References	**ABN-30**				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**C is Correct. IAW ABN-30, before or immediately after evacuating the Control Room, Scram the reactor and confirm all control rods are inserted to or beyond position 04.** **A is Incorrect but plausible. The 'B' Isolation Condenser (IC) is placed in service (the applicant may not recall the correct IC) and the EDGs start on a LOCA or LOOP signal. The applicant may assume with the CR Evacuation an EDG LOOP or LOCA start signal has been generated.** **C is Incorrect but plausible since tripping the Reactor Recirculation Pumps is a correct action. The EDGs start on a LOCA or LOOP signal. The applicant may assume with the CR Evacuation an EDG LOOP or LOCA start signal has been generated.** **D is Incorrect but plausible since placing the 'B' IC in service is a correct action. Tripping all the Feed Pumps is the correct action, however on a normal scram, one Feed Pump is left operating. The applicant may confuse actions of ABN-30 with ABN-1, Reactor Scram. The question specifically asks for ABN-30 actions.**
References to be provided during exam:	**None**
Lesson Plan	**2621.828.0.0064, Alternate Shutdown Facility**
Learning Objective/	**ASF-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, EOP & EOP support procedures, and EP procedures.**

Question Source (New, Modified, Bank)	**New**
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**	**N/A**

EXAMINATION ANSWER KEY

OC 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	**55.41b**	**10**	**55.43b**	
	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.:	**295016**	**PRA:**	**No**	
Safety Function:	**7**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

49 **ID: 11-1 NRO 49** **Points: 1.00**

The plant was at rated power when a LOCA occurred. The following conditions currently exist:

- Containment Spray Pump 51A is operating in the DW SPRAY mode
- Containment Spray Pump 51C is operating in the TORUS CLG mode
- Drywell pressure is 13 psig and lowering

The following annunciators then alarmed:

- S1A BRKR TRIP
- BUS 1A U/V

Which of the following states the response of the Containment Spray Pumps 51A and 51C?

	Containment Spray Pump 51A	**Containment Spray Pump 51C**
A.	Trips **AND** can be re-started immediately after AC power is restored	Trips **AND** can be re-started immediately after AC power is restored
B.	Trips **AND** will automatically restart after a time delay after AC power is restored	Remains running
C.	Remains running	Trips **AND** will automatically restart after AC power is restored
D.	Trips **AND** can be re-started after a time delay after AC power is restored	Remains running

Answer: D

Answer Explanation

QID: 11-1 NRO 49		
Question #	**49**	**Developer / Date: JJR / 5-14-2012**

EXAMINATION ANSWER KEY

OC RO NRC Exam

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
295024 High Drywell Pressure / 5 EA1.17 - Ability to operate and/or monitor the following as they apply to HIGH DRYWELL PRESSURE: Containment spray: Plant-Specific				3.9	3.9
Level	RO	Tier	1	Group	1
General References	RAP-S1f	237E901 sh 1 116B8328 sh11a	BR 3000		
Explanation	D is Correct. The question stem states there is a LOCA with Drywell with Containment Spray in service (which indicates DW press and temp are high). The question shows that containment spray pump 51A (powered from USS Bus 1A2, which is powered from 4160 VAC Bus 1C) is spraying the drywell, and that containment spray pump 51C (powered from USS Bus 1B2, which is powered from 4160 VAC Bus 1D) is cooling the torus. The alarm given describes a loss of the startup transformer (SA) to Bus 1A and onto Bus 1C (which powers bus 1A2). When this occurs, containment spray pump 51A will trip, and EDG1 will start and load onto bus 1C, which will automatically re-energize bus 1A2. But, there is a 200 second time delay after the EDG has loaded onto the bus to allow for sequenced loading. There is no auto start of the pumps, even if they were previously running when the startup power was lost. Therefore, containment spray pump 51A will trip, and can be manually re-started after a time delay after the bus power is restored. The loss of the startup transformer SA does not impact the running containment spray pump 51C, since it is still powered from the second startup transformer, SB. Therefore, it will remain running. All distractors are Incorrect but plausible if the applicant does not recall the power supplies to the Containment Spray Pumps and does not recall which Containment Spray Pumps are affected by a loss of power to 4160 VAC Bus 1A & 1C.				
References to be provided during exam:	None				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Lesson Plan	**2621.828.0.0009, Containment Spray/ESW**
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:** **Question Source:** **Previous 2 Exams:**		**609265** **ILT 07-1 SRO NRC Exam** **No**		
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	**55.41b**	**7**	**55.43b**	
	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.:	**295024**	**PRA:**	**No**	
Safety Function:	**5**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

50 **ID: 11-1 NRO 50** **Points: 1.00**

The plant was at rated power making preparations to shutdown due to a loss of USS-1A2. An event then occurred resulting in a small leak in the Drywell. The following plant parameters were observed:

- Drywell Pressure is 1.7 psig
- Drywell Temperature is 152° F

The crew has entered the Primary Containment Control EOP.

The US has ordered the BOP to perform Support Procedure 27 (SP-27), Maximizing Drywell Cooling.

Which of the following Drywell Recirc Fans will be running following the completion of SP-27?

1. DW RECIRC FAN 1-1
2. DW RECIRC FAN 1-2
3. DW RECIRC FAN 1-3
4. DW RECIRC FAN 1-4
5. DW RECIRC FAN 1-5

A. 1 and 2 **ONLY**

B. 4 and 5 **ONLY**

C. 1, 2, and 3 **ONLY**

D. 1, 2, 3, 4, and 5

Answer: B

Answer Explanation		
QID: 11-1 NRO 50		
Question #	**50**	**Developer / Date: JJR / 5-14-2012**

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

EXAMINATION ANSWER KEY

OC RO NRC Exam

295028 High Drywell Temperature / 5 EA1.03 - Ability to operate and/or monitor the following as they apply to HIGH DRYWELL TEMPERATURE : Drywell cooling system				3.9	3.9
Level	RO	Tier	1	Group	1
General References	EMG-SP27	PCC EOP			
Explanation	B is Correct. The normal system lineup for Drywell Recirc fans are the 1-1, 1-2, 1-4, & 1-5 fan in operation with the 1-3 fan off. The question states there is a loss of USS-1A2. The power supply to Drywell recirc fans 1-1, 1-2, & 1-3 is MCC-1A23 via USS-1A2, therefore Drywell Recirc fans 1-1, 1-2, & 1-3 do not have power available to operate. Only Drywell Recirc fans 1-4 & 1-5 are available for Drywell cooling. A, C, & D are Incorrect but plausible if the applicant does not recall the actions required by SP-27 or recall the power supply to the drywell cooling pumps. Drywell Recirc fans 1-1, 1-2, & 1-3 are powered from MCC-1A23 via USS-1A2. Since USS-1A2 has been lost, those fans are not operable. Answers A, C, & D include one or more of Drywell Recirc fans 1-1, 1-2, or 1-3 as a choice, therefore which is incorrect. The only fans that have power available are Drywell Recirc fans 1-4 & 1-5.				
References to be provided during exam:	None				
Lesson Plan Learning Objective/	2621.845.0.0056, Primary Containment Control 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)			Bank	
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:	811733 ILT Bank No			
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 2:RI

EXAMINATION ANSWER KEY

OC RO NRC Exam

	NUREG 1021 Appendix B: Recognizing Interaction between systems (plural), including consequences and implications			
10CRF55 Content	**55.41b**	**7**	**55.43b**	
	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.:	**295028**	**PRA:**	**No**	
Safety Function:	**5**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

51 **ID: 11-1 NRO 51** **Points: 1.00**

The plant was at 57% power in 5 loop operation. An event then occurred resulting in a trip of the 'C' Reactor Reactor Recirculation Pump. All Immediate Operator Actions of ABN-2, Recirculation System Failures, have been completed by the crew.

The following conditions exist:

- Reactor power is 45% and steady
- Reactor recirculation flow is 6.5 x 10^4 GPM and steady

IAW 202.1, Power Operation, which of the following actions are required?

A. Manually scram the reactor.

B. Raise reactor power to 60% with control rods.

C. Lower reactor power to 30% with control rods.

D. Raise reactor recirculation flow to 7.0 x 10^4 GPM.

Answer: D

Answer Explanation

QID: 11-1 NRO 51		
Question #	**51**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4 AA2.01 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION : Power/flow map				**3.5**	**3.8**
Level	**RO**	**Tier**	**1**	**Group**	**1**

EXAMINATION ANSWER KEY

OC RO NRC Exam

General References	**202.1**		
Explanation	**D is Correct. The question describes an event in which power and recirculation flow place the plant in the Exclusion Zone on the Power Operations Curve (Power/flow map). IAW procedure 202.1, Power Operation, the operator is to exit the zone using rods or flow. The recirculation flow in answer D places the plant outside of the zone.** **A is Incorrect but plausible. 202.1 states if the Exclusion Zone is entered, EXIT it immediately using rods or flow. The applicant may interpret a reactor scram as an acceptable method of using rods, however this is incorrect and not the intent of this procedural direction.** **B is Incorrect. Raising reactor power to 60% would move the plant out of the zone, but it would also pass the scram setpoint. It is plausible the applicant may not interpret the Power Operations curve correctly and not recognize this.** **C is Incorrect. Lowering reactor power to 30% would not place the plant outside of the zone. It is plausible the applicant may not interpret the Power Operations curve correctly and not recognize this.**		
References to be provided during exam:	**Att 202.1-2**		
Lesson Plan	**2621.828.0.0038, Reactor Recirculation System**		
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)			**Modified**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**609320** **ILT 07-1 NRC Exam** **No**		
Cognitive Level	**Memory or Fundamental Knowledge**		**Comprehension or Analysis**	**X** **3:SPR**

EXAMINATION ANSWER KEY

OC RO NRC Exam

	NUREG 1021 Appendix B: Solve a Problem using References			
10CRF55 Content	**55.41b**	**10**	**55.43b**	
	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.:	**295001**	**PRA:**	**No**	
Safety Function:	**1 & 4**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

52 **ID: 11-1 NRO 52** **Points: 1.00**

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

- 1B2 MN BRKR OL TRIP

If DC-B voltage was 133 volts just prior to the event, and is lowering at a constant 2 volts/minute, which of the following is correct? (**SEE BELOW**)

__(X)__ is currently **OPERABLE** and will be **INOPERABLE** in __(Y)__ minutes.

ATTACHMENT ABN-48-3
B BATTERY MINIMUM VOLTAGE FOR EQUIPMENT OPERABILITY

BATTERY	LOAD	REQUIRED BATTERY VOLTAGE
B	* 'A' IC V-14-31	Battery Charger available
	* 'A' IC V-14-34	Battery Charger available
	* C/U Iso. Valve V-16-2	Battery Charger available
	* C/U Iso. Valve V-16-14	Battery Charger available
	CORE SPRAY NZ01C	113.3
	SERVICE WATER PUMP 1-1	111
	CRD FEED PUMP NC08B	111
	FOXBORO ER-622-120	109
	SRM/IRM	105
	EMERGENCY LIGHTING PANEL	105
	CORE SPRAY CH B (ER18B)	104
	CORE SPRAY CH A (ER18A)	103
	CONTAIN SP. RELAYS (ER8B)	102
	H2 & STATOR WATER COOLING RY.	102
	RSP RELAYS	101
	CIP-3	101
	INVERTER INV-735-001	101

	(X)	(Y)
A.	A IC V-14-34	7
B.	Core Spray NZ01C	9
C.	CRD Feed Pump NC08B	12
D.	RSP Relays	14

EXAMINATION ANSWER KEY

OC RO NRC Exam

Answer: C

Answer Explanation

QID: 11-1 NRO 52		
Question #	52	Developer / Date: JJR / 5-14-2012

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
295004 Partial or Total Loss of DC Pwr / 6 AA2.03 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER : Battery voltage				2.8	2.9
Level	RO	Tier	1	Group	1
General References	ABN-48	3028 sh. 1			

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**C is Correct. The alarm in the question stem shows a loss of USS 1B2. This results in the loss of all battery chargers to DC-A and DC-B. In 12 minutes, DC-B voltage will lower to 109 volts (122- [2x12] = 109), which is less than the minimum voltage for operability of 111 for the CRD pump.** **A is Incorrect but plausible does not interpret the discharge rate for the B Battery correctly. The table provided shows that A IC V-14-34 is inoperable when the charger is inoperable. Thus, the valve is inoperable at the time of the initial breaker annunciator.** **B is Incorrect but plausible does not interpret the discharge rate for the B Battery correctly. In 9 minutes, DC-B voltage will lower to 115 volts (122-[2x9] = 115), which is greater than the minimum of 113.3 volts for the pump. Thus the pump is still operable.** **D is Incorrect but plausible does not interpret the discharge rate for the B Battery correctly. In 14 minutes, DC-B voltage will lower to 105 volts (122-[2x14]) = 105), which is greater than the minimum of 101 volts for the relays. Thus the relays are still operable.**
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**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**	**666832** **ILT Bank** **No**			
Cognitive Level	**Memory or Fundamental Knowledge**		**Comprehension or Analysis**	**X** **3:SPR**
	NUREG 1021 Appendix B: Solve a Problem using References			

EXAMINATION ANSWER KEY

OC RO NRC Exam

10CRF55 Content	**55.41b**	**10**	**55.43b**	
	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.:	**295004**	**PRA:**	**No**	
Safety Function:	**6**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

53 **ID: 11-1 NRO 53** **Points: 1.00**

The plant is operating at 100% power when a small unisolable leak develops on the common piping of the VARIABLE leg of the "B" Yarway level indicator.
(Assume this leak does **not** significantly affect reference leg temperature)

Based on the above information, which of the following will occur?

A. Reactor scram **ONLY**

B. Reactor scram **AND** LO-LO initiations/isolations

C. LO-LO **AND** LO-LO-LO initiations/isolations **ONLY**

D. Reactor scram plus LO-LO **AND** LO-LO-LO initiations/isolations

Answer: B

Answer Explanation

QID: 11-1 NRO 53		
Question #	**53**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
295031 Reactor Low Water Level / 2 EA2.01 - Ability to determine and/or interpret the following as they apply to REACTOR LOW WATER LEVEL : Reactor water level				**4.6**	**4.6**
Level	**RO**	**Tier**	**1**	**Group**	**1**
General References	**RAP-H1e, H3e, H5e**				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	B is Correct. A leak on the B Yarway variable leg will indicate a lowering reactor water level. Yarway level instrument generates a reactor scram and a Lo-Lo isolation and initiation signal. Lo-Lo-Lo signal is generated from a Gemac instrument. The applicant must correctly determine and interpret what indicated RPV water level will do and what protective functions will actuate from the event. All distractors are Incorrect but plausible if the applicant does not correctly identify what protective functions will be actuated by indicated RPV water level lowering.
References to be provided during exam:	None
Lesson Plan	2621.828.0.0055, Rx Vessel Instrumentation
Learning Objective/	RVI-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: Previous 2 Exams:	608203 ILT Bank No			
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	55.41b	7	55.43b	
	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

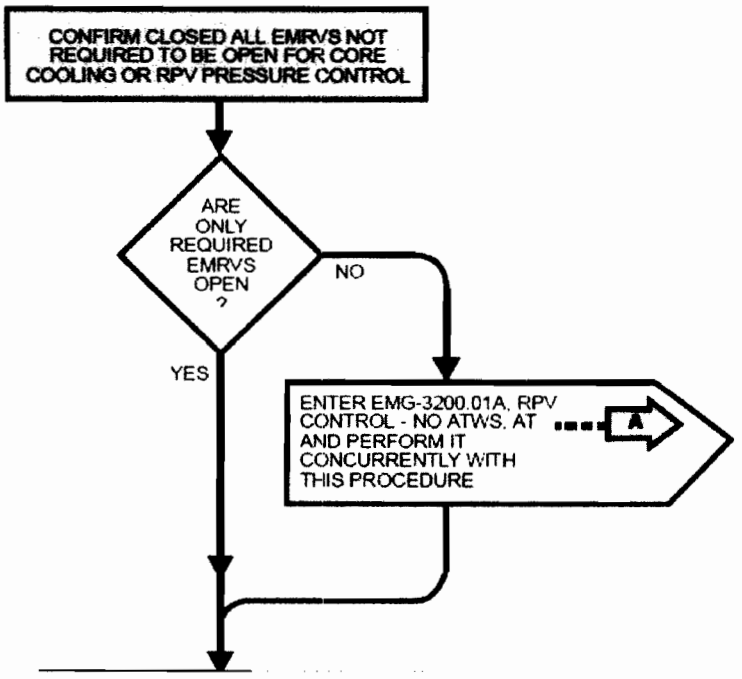
OC RO NRC Exam

System ID No.:	295031	PRA:	No
Safety Function:	2	☒ Initial License Level ☐ LORT	

54 **ID: 11-1 NRO 54** **Points: 1.00**

The plant was at power when an EMRV opened unexpectedly, and could **NOT** be closed. Primary Containment Control EOP was entered due to high Torus Water Temperature.

In the Torus Water Temperature leg, you are directed to enter RPV Control - No ATWS EOP, as shown in the EOP steps below:



Which of the following lists the basis for entering RPV Control - No ATWS?

Entering RPV Control - No ATWS is required to ensure that...

A. the total integrated heat available to be discharged to the torus through the open EMRV is minimized.

B. the reactor will be able to be shut down prior to reaching the requirement for boron injection.

C. the torus load limit will NOT be exceeded prior to the need to emergency depressurize.

D. the hydrodynamic loads on the EMRV discharge line components are minimized.

EXAMINATION ANSWER KEY

OC RO NRC Exam

Answer: A

Answer Explanation

QID: 11-1 NRO 54		
Question #	54	Developer / Date: JJR / 5-14-2012

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
295026 Suppression Pool High Water Temp. / 5 2.4.18 - Emergency Procedures / Plan: Knowledge of the specific bases for EOPs.				3.3	4.0
Level	RO	Tier	1	Group	1
General References	EOP User's Guide	PCC EOP			

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**A is Correct. The EOP User's Guide provides the following: If any EMRV cannot be closed, shut down of the Reactor is ensured through entry to the RPV CONTROL - NO ATWS procedure. If the scram is successful, the total integrated heat available to be discharged to the Torus through the open EMRV(s) is minimized. This action is appropriate even if the Technical Specification limit requiring a scram on high Torus water temperature (110ø F) has not yet been reached.** **B is Incorrect but plausible. This is the justification for the next requirement in Primary Containment Control to enter RPV Control - No ATWS: prior to reaching BIIT, then enter RPV Control - No ATWS. Entry into EMG-3200.01A to scram is required prior to reaching BIIT to ensure the reactor is shutdown. From the EOP User's Guide: Scramming the Reactor before Torus temperature reaches the Boron Injection Initiation Temperature (BIIT) gives the benefit of knowing whether the Reactor will be able to be shut down prior to reaching the requirement for boron injection.** **C is Incorrect but plausible since it is related to the basis for entering RPV Control - No ATWS due to high torus water level. The applicant may not recall the correct basis.** **D is Incorrect but plausible since it is also related to the basis for entering RPV Control - No ATWS due to high torus water level. The applicant may not recall the correct basis.**
References to be provided during exam:	**None**
Lesson Plan	**2621.845.0.0056, Primary Containment Control**
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**
<u>If Bank or Modified</u> **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**	 **510679** **ILT Bank** **No**

EXAMINATION ANSWER KEY

OC RO NRC Exam

Cognitive Level	**Memory or Fundamental Knowledge**	**X 1:B**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: Bases or purpose			
10CRF55 Content	**55.41b**	**10**	**55.43b**	
	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**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

55 **ID: 11-1 NRO 55** **Points: 1.00**

The plant is at rated power when the following annunciator came into alarm (and is confirmed valid):

- CONTROL AIR PRESS LO

IAW RAP-H1a, Control Air Press Lo, insert a manual scram IAW ABN-1, Reactor Scram, if...

A. the feedwater control valves lockup due to a loss of air signal.

B. Service Air valve V-6S-2 is **NOT** isolated or is bypassed.

C. two or more control rods begin to drift into the core.

D. the RWCU system isolation valves close.

Answer: C

Answer Explanation

QID: 11-1 NRO 55		
Question #	**55**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information		
K&A	**Importance Rating**	
	RO	**SRO**
295019 Partial or Total Loss of Inst. Air / 8 2.4.50 - Emergency Procedures / Plan: Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	**4.2**	**4.0**

Level	**RO**	**Tier**	**1**	**Group**	**1**
General References	**RAP-H1a**				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	C is Correct. IAW RAP-H1a, a manual scram must be inserted if control air pressure lowers to 55 psig or if ≥ 2 control rods begin to drift into the core. All distractors are Incorrect but plausible since they will occur due on lowering instrument air pressure, however the only choice listed that requires a scram per the alarm response procedure is choice C.
References to be provided during exam:	None
Lesson Plan	2621.828.0.0043, Service, Instrument, and Breathing Air
Learning Objective/	CAS-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: Previous 2 Exams:	506586 ILT Bank No			
Cognitive Level	Memory or Fundamental Knowledge	X 1:P	Comprehension or Analysis	
	NUREG 1021 Appendix B: Procedure steps and cautions			
10CRF55 Content	55.41b	10	55.43b	
	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.:	295019	PRA:	No	

EXAMINATION ANSWER KEY

OC RO NRC Exam

Safety Function:	**8**	☒ **Initial License Level** ☐ **LORT**

EXAMINATION ANSWER KEY

OC RO NRC Exam

56 **ID: 11-1 NRO 56** **Points: 1.00**

Given the following plant conditions and sequence of events occur:

- A plant startup is in progress
- RPV temperature is 200 °F
- TBCCW heat exchangers are using Service Water
- RBCCW temperatures are high in band and rising

Based on these conditions, what action(s) is(are) required to improve RBCCW cooling IAW ABN-19, RBCCW Failure Response?

A. Trip all recirculation pumps **ONLY.**

B. Scram the reactor and trip all recirculation pumps.

C. Place TBCCW heat exchangers on Circulating water.

D. Place RBCCW heat exchangers on Circulating water.

Answer: C

Answer Explanation

QID: 11-1 NRO 56		
Question #	**56**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
295018 Partial or Total Loss of CCW / 8 2.1.23 – Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.				**4.3**	**4.4**
Level	**RO**	**Tier**	**1**	**Group**	**1**
General References	**ABN-19**				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**C is Correct. IAW ABN-19, rising RBCCW temperature is considered a partial loss of RBCCW cooling and requires entry into the ABN. The only choice provided which the ABN requires for this condition is to transfer TBCCW heat exchanger cooling to the Circulating Water System.** **A & B are Incorrect but plausible since they are actions required by the ABN, however only if RPV temperature is >212 °F. The question states RPV temperature is 200 °F.** **D is Incorrect but plausible if the applicant does not recall the actions of ABN-19 or believes that RBCCW heat exchangers can be aligned to the Circulating Water System, which they cannot.**
References to be provided during exam:	**None**
Lesson Plan **Learning Objective/**	**2621.828.0.0035, Reactor Building Closed Cooling Water** **RBC-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 in accordance with applicable ABN, EOP and EOP support procedures, and EP Procedures.**

Question Source (New, Modified, Bank)			**Bank**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**607825** **ILT Bank** **No**		
Cognitive Level	**Memory or Fundamental Knowledge**	**X** **1:P**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: Procedure steps and cautions			
10CRF55 Content	**55.41b**	**10**	**55.43b**	
	Administrative, normal, abnormal, and emergency operating procedures for the facility.			

EXAMINATION ANSWER KEY

OC RO NRC 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.:	**295018**	**PRA:**	**No**
Safety Function:	**8**	☒ **Initial License Level** ☐ **LORT**	

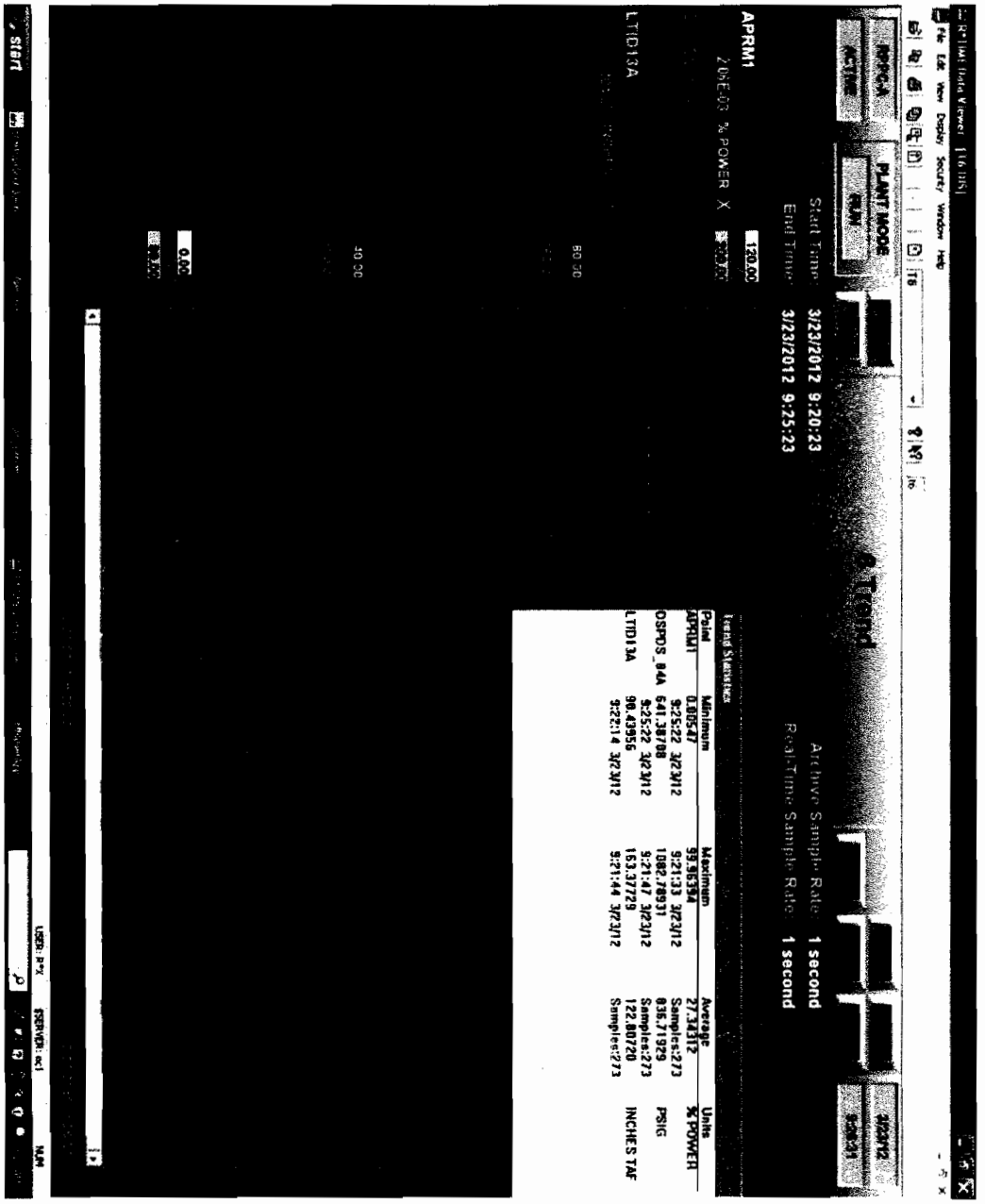
EXAMINATION ANSWER KEY

OC RO NRC Exam

57 **ID: 11-1 NRO 57** **Points: 1.00**

The plant was at rated power when a complete Loss of Offsite Power (LOOP) occurred. The event was captured on the Plant Process Computer (**SEE BELOW**).

Which of the following correctly states the trend of Reactor Power, RPV Pressure, and RPV Water Level the **FIRST** <u>two minutes</u> following the LOOP? (Assume **NO** operator action)



EXAMINATION ANSWER KEY

OC RO NRC Exam

	Reactor Power	RPV Pressure	RPV Water Level
A.	Lower **ONLY**	Lower **ONLY**	Lower **ONLY**
B.	Rise, then Lower	Rise, then Lower	Lower, then Rise
C.	Lower **ONLY**	Rise, then Lower	Lower, then Rise
D.	Rise, then Lower	Rise, then Lower	Lower **ONLY**

Answer: C

Answer Explanation

QID: 11-1 NRO 57		
Question #	**57**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information		
K&A	**Importance Rating**	
	RO	**SRO**
295003 Partial or Complete Loss of AC / 6 AA2.02 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : Reactor power, pressure, and level	**4.2**	**4.3**

Level	**RO**	**Tier**	**1**	**Group**	**1**
General References	**ABN-36**		**ABN-10**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	C is Correct. Immediately occurring on a Loss of Offsite Power (LOOP) from rated power, RPS de-energizes, the MSIVs close, the Turbine Trips, and all Reactor Feed Pumps trip. When RPS de-energizes, all Control Rods will immediately insert causing reactor power to lower, and trend lower. When the Turbine trips (on load rejection) and MSIVs close, RPV Pressure will rise greater than the Isolation Condenser ATWS setpoint (1051 psig) and EMRV setpoints (1065#) for a few seconds. After that, Isolation Condensers immediately go in service and RPV Pressure will lower at a steady rate (until the RPV is depressurized without operator action). Immediately after the LOOP, all Reactor Feed Pumps trip. This, combined with all Control Rods inserting and the rapid drop in reactor power, will result in RPV water level 'shrink'. As the transient stabilizes (within about 30 seconds) RPV water level will start to rise. In addition, 60 seconds after the LOOP, both CRD pumps will start resulting in an additional rise in RPV water level. All distractors are Incorrect but plausible if the applicant does not recall plant critical parameters immediately following a LOOP. It is plausible that they would think reactor power would rise with and RPV pressure rise, however the negative reactivity from all control rods inserting is much greater than the positive reactivity added by voids collapsing. It is also plausible they might not recall that RPV water level will start rising following a transient that results in RPV water level 'shrink'.
References to be provided during exam:	None
Lesson Plan	2621.828.0.0016, Electrical Distribution System
Learning Objective/	ACD-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
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:	N/A

EXAMINATION ANSWER KEY

OC RO NRC Exam

Cognitive Level	**Memory or Fundamental Knowledge**		**Comprehension or Analysis**	**X 3:PEO**
	NUREG 1021 Appendix B: Predict an Event or Outcome			
10CRF55 Content	**55.41b**	**5**	**55.43b**	
	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.:	**295003**	**PRA:**	**No**	
Safety Function:	**6**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

58 **ID: 11-1 NRO 58** **Points: 1.00**

Which of the following have a Control Room annunciator to indicate a potential Liquid Off-site Radioactivity Release is in progress?

A. Radwaste Overboard **AND** Sump 1-5 Collection Pit

B. Emergency Service Water **AND** Condensate Transfer

C. Service Water **AND** Reactor Building Closed Cooling Water

D. Radwaste Service Water **AND** Turbine Building Closed Cooling Water

Answer: C

Answer Explanation

QID: 11-1 NRO 58		
Question #	**58**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
295038 High Off-site Release Rate / 9 EK2.06 - Knowledge of the interrelations between HIGH OFF-SITE RELEASE RATE and the following: Process liquid radiation monitoring system				**3.4**	**3.7**
Level	**RO**	**Tier**	**1**	**Group**	**1**
General References	**RAP-10F3g**	**RAP-10F3f**	**ABN-27**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**C is Correct. The Service Water System and RBCCW System are monitored by the Process Radiation Monitoring System. High activity in either system will result in a Control Room annunciator and entry into ABN-27, Inadvertent Overboard Radioactive Liquid Release or Cross-Contamination.** **A is Incorrect but plausible. The 1-5 Sump Collection Pit is monitored, but the Radwaste Overboard monitoring system is retired and no longer functions.** **B & D Incorrect but plausible if the applicant believes these systems are monitored for radioactivity in the Control Room, which they are not.**
References to be provided during exam:	**None**
Lesson Plan	**2621.828.0.0033A, Plant Radiation Monitoring System**
Learning Objective/	**273-10449, 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)		**New**		
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**N/A**		
Cognitive Level	**Memory or Fundamental Knowledge**	**X** **1:F**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: Facts			
10CRF55 Content	**55.41b**	**11**	**55.43b**	
	Purpose and operation of radiation monitoring systems, including alarms and survey equipment.			
Justification for LORT questions with K/A values < 3.0	**N/A**			

EXAMINATION ANSWER KEY

OC RO NRC Exam

Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	**295038**	**PRA:**	**No**
Safety Function:	**9**	☒ **Initial License Level** ☐ **LORT**	

EXAMINATION ANSWER KEY

OC RO NRC Exam

59 **ID: 11-1 NRO 59** **Points: 1.00**

The plant is at rated power when an ATWS occurred.

Which of the following describes two ways to add negative reactivity to the core under these conditions?

A. Lowering RPV Pressure **AND** raising RPV water level

B. Lowering RPV pressure **AND** lowering reactor water level

C. Initiating Standby Liquid Control **AND** raising RPV water level

D. Initiating Standby Liquid Control **AND** lowering RPV water level

Answer: D

Answer Explanation

QID: 11-1 NRO 59		
Question #	**59**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
295015 Incomplete SCRAM / 1 AK1.03 - Knowledge of the operational implications of the following concepts as they apply to INCOMPLETE SCRAM : Reactivity effects				**3.8**	**3.9**
Level	**RO**	**Tier**	**1**	**Group**	**2**
General References	**RPVC - with ATWS EOP**	**EOP User's Guide**			

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**D is Correct. Two methods used to lower reactor power (add negative reactivity) are injecting SLC (adds boron which is a poison) and lowering RPV water level (voids core).** **A is Incorrect but plausible if the applicant does not recall the actions to reduce reactor power in the RPV Control - with ATWS EOP. Lowering RPV Pressure reduces RPV Temperature adding positive reactivity. Raising RPV water level collapses voids adding positive reactivity.** **C is Incorrect but plausible if the applicant does not recall the actions to reduce reactor power in the RPV Control - with ATWS EOP. It is true lowering RPV water level will add negative reactivity (voids core) however lowering RPV Pressure reduces RPV Temperature adding positive reactivity.** **D is Incorrect but plausible if the applicant does not recall the actions to reduce reactor power in the RPV Control - with ATWS EOP. It is true initiating SLC adds negative reactivity however raising RPV water level collapses voids which adds positive reactivity.**
References to be provided during exam:	**None**
Lesson Plan **Learning Objective/**	**2621.845.0.0053, RPV Control - with ATWS** **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)			**Modified**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**332471** **Dresden ILT Exam Bank** **No**		
Cognitive Level	**Memory or Fundamental Knowledge**	**X** **1:F**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: Facts			

EXAMINATION ANSWER KEY

OC RO NRC Exam

10CRF55 Content	55.41b	1	55.43b	
	Fundamentals of reactor theory, including fission process, neutron multiplication, source effects, control rod effects, criticality indications, reactivity coefficients, and poison effects.			
Justification for LORT questions with K/A values < 3.0	N/A			
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	295015	PRA:	No	
Safety Function:	1	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC RO NRC Exam

60 **ID: 11-1 NRO 60** **Points: 1.00**

The plant was at rated power. Plant conditions include the following:

- A operator is inserting a TIP into the core on #2 TIP machine
- An event then resulted in a spurious LOCA signal

In addition to the TIP purge valve closing, which one of the following statements correctly describes the response of the TIP system?

First the __(1)__. Then the __(2)__.

	(1)	(2)
A.	TIP drive withdraws the detector to the in-shield position	shear valve fires
B.	TIP drive withdraws the detector to the in-shield position	ball valve closes
C.	ball valve closes	TIP drive withdraws the detector to the in-shield position
D.	shear valve fires	TIP drive withdraws the detector to the in-shield position

Answer: B

Answer Explanation		
QID: 11-1 NRO 60		
Question #	**60**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information		
K&A	**Importance Rating**	
	RO	**SRO**
295020 Inadvertent Cont. Isolation / 5 & 7 AK2.08 - Knowledge of the interrelations between INADVERTENT CONTAINMENT ISOLATION and the following: Traversing in-core probes: Plant-Specific	**2.5**	**2.6**

EXAMINATION ANSWER KEY

OC RO NRC Exam

Level	RO	Tier	1	Group	2
General References	405.2				
Explanation	B is Correct. The stem provides a condition where a spurious LOCA signal was received. On a Primary Containment isolation signal (LOCA signal), any TIP detectors that are not in-shield will automatically retract. Once in-shield, the ball valve(s) will automatically close. All distractors are Incorrect but plausible if the applicant does not recall what happens to the TIPs on a containment isolation signal.				
References to be provided during exam:	None				
Lesson Plan Learning Objective/	2621.828.0.0029, Nuclear Instrumentation NIS-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)	Modified			
If Bank or Modified VISION System/Question ID: Question Source: Previous 2 Exams:	608248 ILT Bank No			
Cognitive Level	Memory or Fundamental Knowledge	X 1:I	Comprehension or Analysis	
	NUREG 1021 Appendix B: Interlocks, setpoints, or system (singular) response			
10CRF55 Content	55.41b	7	55.43b	
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			

EXAMINATION ANSWER KEY

OC RO NRC Exam

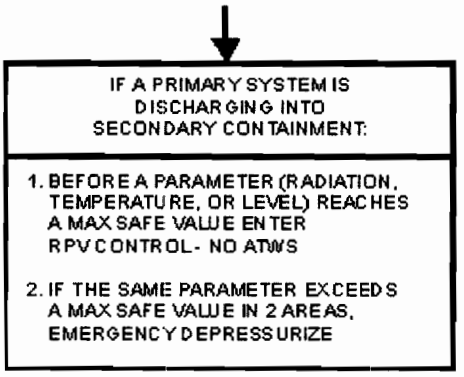
Justification for LORT questions with K/A values < 3.0	**N/A**		
Time to Complete: 1-2 minutes		**Point Value: 1**	
System ID No.:	**295020**	**PRA:**	**No**
Safety Function:	**5 & 7**	☒ **Initial License Level** ☐ **LORT**	

EXAMINATION ANSWER KEY

OC RO NRC Exam

61 **ID: 11-1 NRO 61** **Points: 1.00**

The following is a partial summary of steps contained in the temperature leg of the Secondary Containment Control EOP:



IAW the EOP Users Guide, which of the following states the bases for Emergency Depressurization above?

1. It places the RPV in the lowest energy state.
2. It reduces the driving head on primary systems discharging into the Secondary Containment.
3. It allows RPV injection from low pressure systems to makeup for the primary system leak.
4. It minimizes the amount of energy available to be deposited into the Primary Containment.

A. 1 **ONLY**

B. 1 and 2 **ONLY**

C. 2 and 3 **ONLY**

D. 1, 3, and 4 **ONLY**

Answer: B

Answer Explanation		
QID: 11-1 NRO 61		
Question #	**61**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information

EXAMINATION ANSWER KEY

OC RO NRC Exam

K&A	Importance Rating	
	RO	SRO
295032 High Secondary Containment Area Temperature / 5 EK3.01 - Knowledge of the reasons for the following responses as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE : Emergency/normal depressurization	3.5	3.8

Level	RO	Tier	1	Group	2

General References	SCC EOP	EOP User's Guide	

Explanation	B is Correct and A is Incorrect. IAW the EOP Users Guide, the temperature increases is so wide spread that is poses a direct threat to secondary containment integrity, equipment located in the secondary containment or continued safe operation. ED will place the plant in its lowest energy state and will reduce the driving head and flow from primary systems that are discharging into the secondary containment. C is Incorrect but plausible. It is true that lowering RPV pressure will make alternate, low pressure systems available for RPV injection, but it is not the bases for the ED. D is Incorrect but plausible. ED is performed by opening the EMRVs which releases the energy from the RPV into the Torus. ED does not reduce the amount of energy to be released to the primary containment.
References to be provided during exam:	None
Lesson Plan	2621.845.0.0057, Secondary Containment Control
Learning Objective/	SCC-3082, Using the Secondary Containment Control EOP, 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

EXAMINATION ANSWER KEY

OC RO NRC Exam

If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**663558** **ILT 08-1 NRC Exam** **No**		
Cognitive Level	**Memory or Fundamental Knowledge**	**X** **1:B**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: Bases or purpose			
10CRF55 Content	**55.41b**	**10**	**55.43b**	
	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.:	**295032**	**PRA:**	**No**	
Safety Function:	**5**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

62 **ID: 11-1 NRO 62** **Points: 1.00**

The plant is shutdown for a refuel outage when an event occurred requiring entry into the Secondary Containment Control EOP. SP-50, Reactor Building Ventilation Restart, has just been completed.

A short time later the following annuciator came into alarm and was confirmed valid:

- RX BLDG - VENT HI

Which of the following correctly states the impact of this alarm? (Assume **NO** operator action)

A. Reactor Building temperatures will rise due to the reduction in Reactor Building forced air flow.

B. Reactor Building ΔP will become less negative due to the reduction in Reactor Building forced air flow.

C. Air from the Reactor Building will be directed through filters prior to discharge, to minimize the off-site radioactivity release.

D. Air from the Reactor Building will **NOT** be directed through SGTS filters prior to discharge and thus the off-site radioactivity release is rising.

Answer: D

Answer Explanation

QID: 11-1 NRO 62		
Question #	**62**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information		
K&A	**Importance Rating**	
	RO	**SRO**
295033 High Secondary Containment Area Radiation Levels / 9 **EA1.03 - Ability to operate and/or monitor the following as they apply to HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS: Secondary containment ventilation**	**3.8**	**3.8**

EXAMINATION ANSWER KEY

OC RO NRC Exam

Level	RO	Tier	1	Group	2
General References	SCC EOP		EOP User's Guide		SP-50
Explanation	D is Correct. The conditions in the stem indicate the RB ventillation monitors are indicating HI-HI (VENT HI alarm). If the RB vent system is secured and certain conditions are met, Secondary Containment Control EOP overrides directs re-start of the normal RB vent system by performing SP-50. In both the EOP override and in the SP-50, it requires verification that the RB vent rad monitors are not tripped (< 9 mr/hr). In the SP-50, it requires the removal/insertion of EOP bypass plugs. When these are removed/installed, the auto start feature of SGT and isolation of normal RB vent is bypassed. Therefore a valid high-high signal on the RB vent rad monitors has no effect of either the normal RB vent system or SGTS. Therefore, there is no change in forced air flow in the RB (which would occur if SGTS did auto start and normal vent isolated), no air will be discharged through the SGTS filters, and normal RB vent system remains in service (no filtering to minimize offsite release). All distractors are Incorrect but plausible if the applicant does not recall the actions of SP-50 or believes that RB ventilation will secure and the SGTS will start.				
References to be provided during exam:	None				
Lesson Plan	2621.845.0.0057, Secondary Containment Control				
Learning Objective/	SCC-3082, 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)			Modified	
If Bank or Modified VISION System/Question ID: Question Source: Previous 2 Exams:	609041 ILT Bank No			
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:PEO

EXAMINATION ANSWER KEY

OC RO NRC Exam

	NUREG 1021 Appendix B: Predict an Event or Outcome			
10CRF55 Content	**55.41b**	**7**	**55.43b**	
	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.:	**295033**	**PRA:**	**No**	
Safety Function:	**9**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

63 **ID: 11-1 NRO 63** **Points: 1.00**

A plant startup is in progress. Plant conditions include the following:

- All APRMs indicate 12% power
- All IRMs are on Range 10
- The mode switch is in STARTUP
- Recirculation flow is 11 x 10^4 gpm
- Reactor pressure is 1000 psig

A turbine bypass valve malfunction causes:

- A spike in reactor pressure to 1043 psig
- A spike in reactor power to 40%

What is the correct status of the reactor (assume **NO** operator action)?

A. At power

B. Scrammed due to High RPV Pressure

C. Scrammed due to High IRM neutron flux

D. Scrammed due to High APRM neutron flux

Answer: C

Answer Explanation		
QID: 11-1 NRO 63		
Question #	**63**	**Developer / Date: JJR / 5-14-2012**

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				**3.5**	**3.6**
Level	**RO**	**Tier**	**1**	**Group**	**2**

EXAMINATION ANSWER KEY

OC RO NRC Exam

General References	**RAP-G1e**		
Explanation	**C is Correct. Based on conditions in the question stem (Mode Switch in STARTUP at 12% power), the reactor is operating on IRM Range 10. The scram setpoint for IRM Range 10 is 38% (on 0-40% scale) and 118% (on 0-125% scale). APRM indication rising to 40% would exceed both these setpoints (regardless of which one the IRMs are set to) and a reactor scram would occur on High IRM flux.** **A is Incorrect but plausible if the applicant does not recall the plant would scram with the Mode Switch in STARTUP under these conditions.** **B is Incorrect but plausible if the applicant does not recall the High RPV Pressure Scram setpoint (1045 psig).** **D is Incorrect but plausible if the applicant believes a scram would occur but does not recognize the scram was a result of High IRM neutron flux, not High APRM neutron flux.**		
References to be provided during exam:	**None**		
Lesson Plan	**2621.828.0.0037, Reactor Protection System**		
Learning Objective/	**RPS-10453, Explain or describe how this system is interrelated with other plant systems.**		

Question Source (New, Modified, Bank)			**Bank**	
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:	**510863 ILT 05-1 NRC Exam No**			
Cognitive Level	**Memory or Fundamental Knowledge**	**X 1:I**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: <u>I</u>nterlocks, setpoints, or system (singular) response			

EXAMINATION ANSWER KEY

OC RO NRC Exam

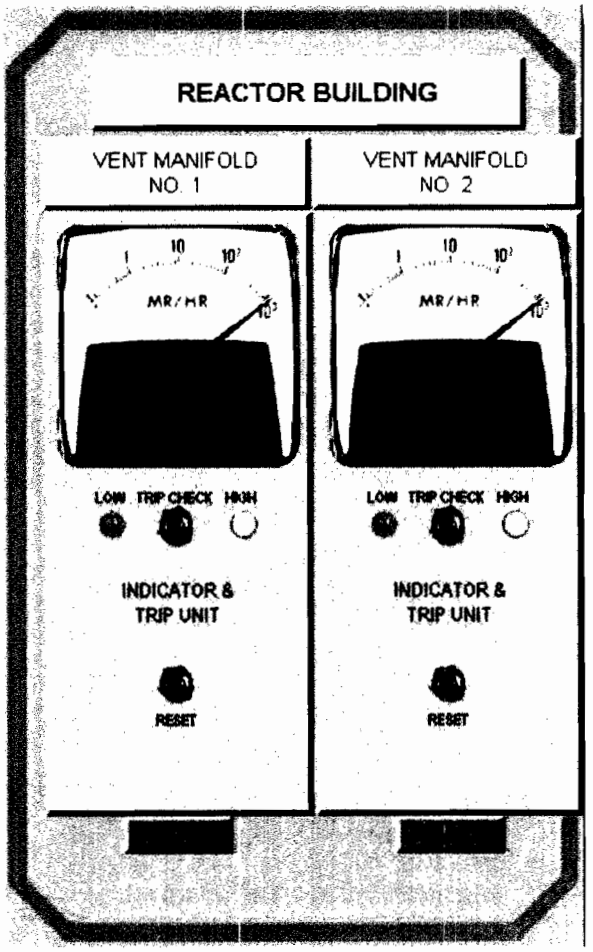
10CRF55 Content	55.41b	10	55.43b	
	Administrative, normal, abnormal, and emergency operating procedures for the facility.			
Justification for LORT questions with K/A values < 3.0	N/A			
Time to Complete: 1-2 minutes			Point Value: 1	
System ID No.:	295006	PRA:	No	
Safety Function:	1	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC RO NRC Exam

64 **ID: 11-1 NRO 64** **Points: 1.00**

The plant is at rated power with all systems normally aligned. You are performing a walkdown of the control room prior to relieving the watch. Electrical Maintenance had completed maintenance activities on Panel 2R on the previous shift. With **NO** Control Room annunciators in alarm, you note the following:



Which of the following Tech Spec LCOs are impacted, if any?

A. 3.5, Containment **ONLY**

B. **NO** Tech Spec LCOs are impacted

C. 3.1, Protective Instrumentation **ONLY**

D. 3.1, Protective Instrumentation **AND** 3.5, Containment

EXAMINATION ANSWER KEY

OC RO NRC Exam

Answer: D

Answer Explanation		
QID: 11-1 NRO 64		
Question #	64	Developer / Date: JJR / 5-14-2012

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
295034 Secondary Containment Ventilation High Radiation / 9 2.2.36 - Equipment Control: 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	1	Group	2
General References	RAP-10F1f		TS 3.1 TS 3.5		GE 706E841

Explanation	**D is Correct. The question shows that both Reactor Building Ventilation radiation monitors are in the alarm condition following electrical maintenance activities on Panel 2R. The radiation monitors in alarm should result in a VENT HI annunicator, RBHVAC isolation, and the auto start of the SGTS. SGTS & RBHVAC Annunciators L-1-b, L-4-b, L-4-c, and L-8-c are expected to be in alarm when RBHVAC isolates and the SGTS auto starts. TS 3.5.B.5 states that two separate SGTS shall be operable. The system that was selected as the priority system did not auto start and cannot be considered operable. TS 3.5 has an LCO impacted. With no other annunciators in alarm and no other indications of a condition in which a high radiation condition would exist in the Reactor Building ventilation system, it can be assumed that both Rx Bldg ventilation rad monitors are inoperable. TS 3.1 also is impacted.** **Answer A is Incorrect but plausible. TS 3.1 states that at least 1 RBHVAC monitor must be Operable. Since both RBHVAC monitors are affected, TS 3.1 has an LCO impacted.** **Answer C is Incorrect but plausible. The question stem shows that there is a Reactor Building Ventilation radiation monitor in the alarm condition following electrical maintenance activities on Panel 2R. With no additional annunciators in the Control Room in alarm (as stated in the question stem), the SGTS did not auto start as required. SGTS & RBHVAC Annunciators L-1-b, L-4-b, L-4-c, and L-8-c are expected to be in alarm when RBHVAC isolates and the SGTS auto starts. TS 3.5.B.5 states that two separate SGTS shall be operable. The system that was selected as the priority system did not auto start and cannot be considered operable. TS 3.5 has an LCO impacted.** **B is Incorrect but plausible. See explanation for distractors A & C. Both TS 3.1 and 3.5 are impacted.**
References to be provided during exam:	**None**
Lesson Plan	**2621.828.0.033A, Plant Radiation Monitoring System**
Learning Objective/	**272-10453, Explain or describe how this system is interrelated with other plant systems.**

Question Source (New, Modified, Bank)	**Modified**

EXAMINATION ANSWER KEY

OC RO NRC Exam

If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**811735** **ILT Bank** **No**		
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	**55.41b**	**10**	**55.43b**	
	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.:	**295034**	**PRA:**	**No**	
Safety Function:	**9**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

65 **ID: 11-1 NRO 65** **Points: 1.00**

The plant is at rated power when an event resulted in a fuel clad failure.

IAW ABN-26, High Main Steam / Off-Gas / Stack Effluent Activity, which of the following conditions would procedurally require the crew to insert a manual scram?

A. **BOTH** OFF GAS HI-HI annunciators have been in alarm for 17 minutes.

B. The STACK EFFLUENT HI-HI annunciator has been in alarm for 20 minutes.

C. **ONE** Main Steam Line Radiation Monitor is indicating 900 mR/hr with Off-gas activity steady.

D. **TWO** Main Steam Line Radiation Monitors are indicating 600 mR/hr with Off-gas activity rising.

Answer: A

Answer Explanation

QID: 11-1 NRO 65		
Question #	**65**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
295017 High Off-site Release Rate / 9 AA1.10 - Ability to operate and/or monitor the following as they apply to HIGH OFF-SITE RELEASE RATE : RPS				**3.6**	**3.7**
Level	**RO**	**Tier**	**1**	**Group**	**2**
General References	**ABN-26**				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**A is Correct. IAW ABN-26, if both Off-Gas Hi-Hi alarms have not cleared within 15 minutes, the crew must operate RPS and insert a manual scram IAW ABN-1, Reactor Scram.** **B is Incorrect but plausible since it is an annuciator that will alarm as a result of a fuel failure and it has been in alarm > 15 min, however the requirement to scram is from the Off-Gas Hi-Hi alarms.** **C & D are Incorrect but plausible. The requirement is to scram when two or more Main Steam Radiation Monitors are > 800 mR/hr with Off-gas activity rising.**
References to be provided during exam:	**ABN-26**
Lesson Plan Learning Objective/	**2621.828.0.0033A, Plant Radiation Monitoring System** **273-0838, Given auto isolation setpoints, list or identify cause(s), system response, and affected Process RAD Monitors system components.**

Question Source (New, Modified, Bank)			**New**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**N/A**		
Cognitive Level	**Memory or Fundamental Knowledge**		**Comprehension or Analysis**	**X** **3:SPR**
	NUREG 1021 Appendix B: Solve a Problem using References			
10CRF55 Content	**55.41b**	**10**	**55.43b**	
	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

OC RO NRC Exam

System ID No.:	295017	PRA:	No
Safety Function:	9	☒ Initial License Level ☐ LORT	

EXAMINATION ANSWER KEY

OC RO NRC Exam

66 **ID: 11-1 NRO 66** **Points: 1.00**

The plant was at rated power when an event occurred which allowed the use of Transient Alarm Response.

IAW OP-OC-101-111-1001, Strategies For Successful Transient Mitigation, which of the following states the expectation for alarm announcement by this response **AND** when Transient Alarm Response is exited?

	Transient Alarm Response Alarm Announcement	Transient Alarm Response Exited
A.	**ONLY** those alarms associated with EOP entry conditions should be announced	When announced by the Unit Supervisor
B.	**ONLY** those alarms associated with EOP entry conditions should be announced	When all EOPs have been exited
C.	**ONLY** critical alarms should be announced	When announced by the Unit Supervisor
D.	**ONLY** critical alarms should be announced	When all EOPs have been exited

Answer: C

Answer Explanation		
QID: 11-1 NRO 66		
Question #	**66**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
Conduct of Operations 2.1.1 - Knowledge of conduct of operations requirements.				**3.8**	**4.2**
Level	**RO**	**Tier**	**3**	**Category**	**COO**

EXAMINATION ANSWER KEY

OC RO NRC Exam

General References	**OP-OC-101-111-1001**		
Explanation	**C is Correct. IAW procedure OP-OC-101-111-1001, Strategies for Successful Transient Mitigation, when transient alarm response is allowed, only critical alarms and results should be announced to the US (Unit Supervisor). The US shall appraise the transient and as conditions permit, exit transient alarm response by announcing to the crew that transient alarm response is being exited.** **All distractors are Incorrect but plausible in that some are related to normal alarm response or are misinterpretations of the transient alarm response guideline in the procedure.**		
References to be provided during exam:	**None**		
Lesson Plan **Learning Objective/**	**2621.830.0.0017, Conduct of Operations - Admin** **2.1.1 - Knowledge of conduct of operations requirements.**		

Question Source (New, Modified, Bank)			**Bank**	
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:	**609318 ILT 07-1 NRC Exam No**			
Cognitive Level	**Memory or Fundamental Knowledge**	**X 1:P**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: <u>P</u>rocedure steps and cautions			
10CRF55 Content	**55.41b**	**10**	**55.43b**	
	Administrative, normal, abnormal, and emergency operating procedures for the facility.			

EXAMINATION ANSWER KEY

OC RO NRC 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**	☒ **Initial License Level** ☐ **LORT**	

EXAMINATION ANSWER KEY

OC RO NRC Exam

67 **ID: 11-1 NRO 67** **Points: 1.00**

WHICH ONE of the following activities is considered a CORE ALTERATION?

A. Removal of control rod 30-31 from the core.

B. Installation of a new LPRM string in core location 24-25.

C. Withdrawal of control rod blade 30-35 for CRD exercises.

D. Removal of an irradiated LPRM string from core location 48-41.

Answer: A

Answer Explanation		
QID: 11-1 NRO 67		
Question #	**67**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
Conduct of Operations 2.1.36 - Knowledge of procedures and limitations involved in core alterations.				**3.0**	**4.1**
Level	**RO**	**Tier**	**3**	**Category**	**COO**
General References	**TS 1.21**				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**A is Correct. CORE ALTERATION shall be the movement of any fuel, sources, or reactivity control components within the reactor vessel with the vessel head removed and fuel in the vessel. The following exceptions are not considered to be CORE ALTERATIONS:** **a) Movement of source range monitors, local power range monitors, intermediate range monitors, traversing incore probes, or special moveable detectors (including undervessel replacement); and** **b) Control rod movement, provided there are no fuel assemblies in the associated core cell.** **Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.** **All distractors are Incorrect but plausible does not recall the Tech Spec definition for Core Alterations and therefore does not recognize the procedural requirements and limitations associated with Core Alterations.**
References to be provided during exam:	**None**
Lesson Plan	**2621.830.0.0017, Conduct of Operations**
Learning Objective/	**2.1.36 - Knowledge of procedures and limitations involved in core alterations.**

Question Source (New, Modified, Bank)			**Bank**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**690118** **Limerick ILT Bank** **No**		
Cognitive Level	**Memory or Fundamental Knowledge**	**X** **1:D**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: Definitions			
10CRF55 Content	**55.41b**	**10**	**55.43b**	

EXAMINATION ANSWER KEY

OC RO NRC 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.:	**N/A**	**PRA:**	**No**
Safety Function:	**N/A**	☒ **Initial License Level** ☐ **LORT**	

EXAMINATION ANSWER KEY

OC RO NRC Exam

68 **ID: 11-1 NRO 68** **Points: 1.00**

Which of the following would require the use of a grounding device for a clearance IAW Procedure OP-MA-109-101, Clearance and Tagging? The work will require replacing the motor in each case.

A. SDC Pump

B. ESW Pump

C. Core Spray Booster Pump

D. Containment Spray Pump

Answer: B

Answer Explanation

QID: 11-1 NRO 68		
Question #	68	Developer / Date: JJR / 5-14-2012

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
Equipment Control 2.2.13 - Knowledge of tagging and clearance procedures.				4.1	4.3
Level	RO	Tier	3	Category	EQC
General References	OP-MA-109-101				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**B is Correct. IAW the reference, proper safety grounding shall be applied prior to working on high voltage equipment when contact with exposed conductors is planned or possible. The reference also defines high voltage as an energy source 600 volts or above. In the work activities listed in the question stem, all will require removal of the motor and the potential for exposed conductors exists. Of the equipment listed, only the ESW Pump is powered from a bus greater than 600 VAC (Bus 1C or 1D).** **All distractors are Incorrect but plausible since they are large pumps, however are all powered from 480VAC and do not require a grounding device.**
References to be provided during exam:	None
Lesson Plan	2621.830.0.0018, Equipment Control
Learning Objective/	2.2.13 - Knowledge of tagging and clearance procedures.

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified VISION System/Question ID: Question Source: Previous 2 Exams:	609321 ILT Bank No			
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	55.41b	10	55.43b	
	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

OC RO NRC Exam

System ID No.:	N/A	PRA:	No
Safety Function:	N/A	☒ Initial License Level ☐ LORT	

EXAMINATION ANSWER KEY

OC RO NRC Exam

69 **ID: 11-1 NRO 69** **Points: 1.00**

The plant was at 80% power and shutting down, with the following abnormal switch configuration:

- AUTO DEPRESS VALVE NR108A switch is in the OFF position
- The NORMAL/DISABLE switch for EMRV NR108B is in the DISABLE position

Which of the following states those EMRVs which can function in the Pressure Relief Mode to control RPV pressure and/or in the ADS Mode during a LOCA?

	Pressure Relief Mode	**ADS Function**
A.	EMRVs B, C, D and E **ONLY**	All EMRVs
B.	EMRVs A, C, D and E **ONLY**	All EMRVs
C.	EMRVs C, D and E **ONLY**	EMRVs A, C, D and E **ONLY**
D.	EMRVs C, D and E **ONLY**	EMRVs B, C, D and E **ONLY**

Answer: C

Answer Explanation

QID: 11-1 NRO 69		
Question #	**69**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
Equipment Control **2.2.37 - Ability to determine operability and / or availability of safety related equipment.**				**3.6**	**4.6**
Level	**RO**	**Tier**	**3**	**Category**	**EQC**
General References	**729E182**				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	C is Correct. The plant is at power with an abnormal switch configuration. For an EMRV to open, its solenoid must energize. With the front control panel switch in OFF, the affected EMRV will not function in the pressure relief mode, but will function in the ADS mode. With the interior panel switch in DISABLE, the solenoid will not energize at all: the affected EMRV will not function in the pressure relief mode or the ADS mode. Therefore, all EMRVs will function in the ADS mode, except that EMRV which is in DISABLE (NR018B). All EMRVs, except NR108A and NR108B, will function in the pressure relief mode. All other distractors are plausible but incorrect if the student does not recall how EMRVs will function with their control switch in OFF or DISABLE.
References to be provided during exam:	None
Lesson Plan	2621.828.0.0005, Automatic Depressurization System
Learning Objective/	ADS-0368, Describe the EMRV initiation logic for both overpressure operation and operation in the ADS mode. Include the following: 1. Initiation signals and setpoints 2. Timers and setpoints 3. Control switches 4. Panel indications

Question Source (New, Modified, Bank)			Bank	
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:	811675 ILT Bank No			
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	55.41b	7	55.43b	
	Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.			

EXAMINATION ANSWER KEY

OC RO NRC 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**	☒ **Initial License Level** ☐ **LORT**	

EXAMINATION ANSWER KEY

OC RO NRC Exam

70 **ID: 11-1 NRO 70** **Points: 1.00**

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

- RADIATION MONITORS AREA - AREA MON HI

The Operator reports the following:

- ARM RO10-A2, CONTROL ROOM ACCESS AREA, shows the HIGH light lit
- ARM RO10-A3, MAIN CONTROL ROOM, shows a rising trend

IAW the associated RAP, which of the following is correct regarding the Control Room Ventilation System?

The Control Room Ventilation System shall be ...

A. secured.

B. placed in PURGE mode.

C. placed in FULL RECIRC mode.

D. placed in PART RECIRC mode.

Answer: D

Answer Explanation		
QID: 11-1 NRO 70		
Question #	**70**	**Developer / Date: JJR / 5-14-2012**

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

EXAMINATION ANSWER KEY

OC RO NRC Exam

General References	**RAP-10F1k**	**331.1**	
Explanation	**D is Correct. IAW RAP-10F1k, if ARM R010-A1, -A2, or A3 is in alarm, then place the CR HVAC in PART RECRIC. Procedure 331.1 also says to place in PART RECIRC for a radiological release with offsite power available.** **All distractors are Incorrect but plausible if the applicant is not familiar with the actions required for RAP-10F1k or does not recognize that plant conditions require a change in Control Room ventilation.**		
References to be provided during exam:	**None**		
Lesson Plan	**2621.828.0.0054, Turbine Building and Misc Ventilation Systems**		
Learning Objective/	**TMV-02324: Explain the basis, with use of procedure, for the four different modes of control room ventilation damper alignment and the effects of the damper alignment modes on control room habitability.**		

Question Source (New, Modified, Bank)	**Bank**			
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**	**718246** **ILT Bank** **No**			
Cognitive Level	**Memory or Fundamental Knowledge**	**X** **1:P**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: Procedure steps and cautions			
10CRF55 Content	**55.41b**	**12**	**55.43b**	
	Radiological safety principles and procedures.			

EXAMINATION ANSWER KEY

OC RO NRC 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**	☒ **Initial License Level** ☐ **LORT**	

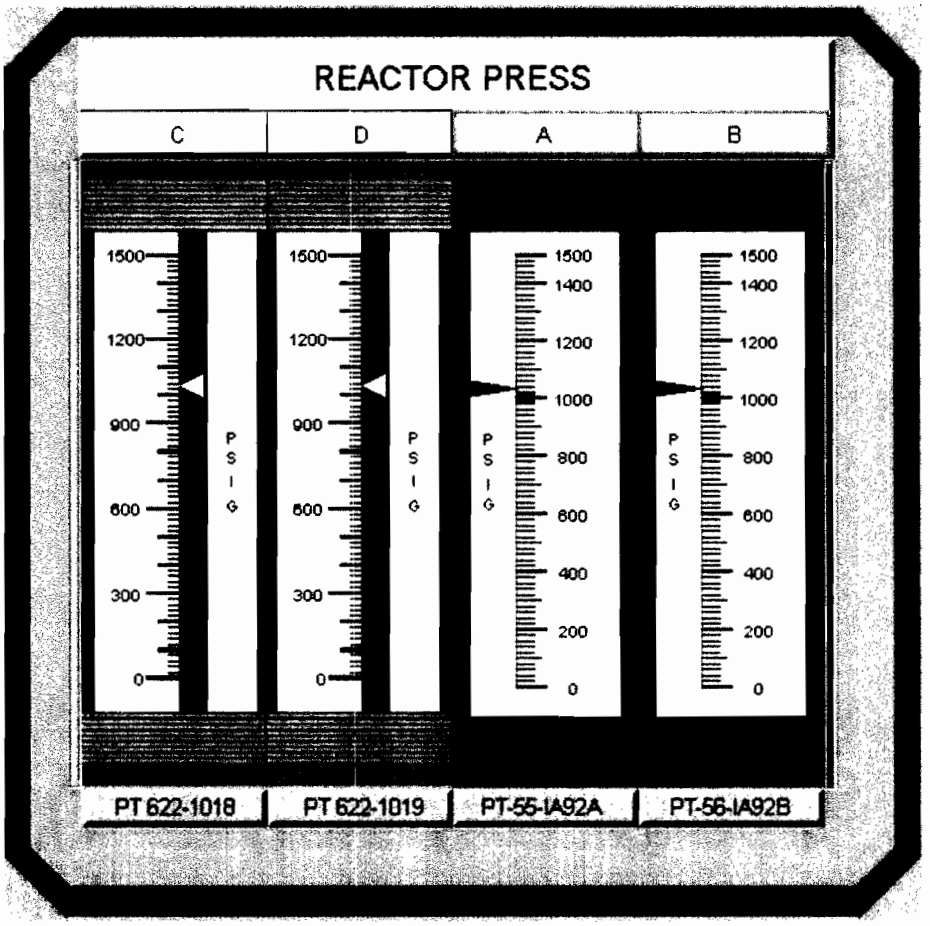
EXAMINATION ANSWER KEY

OC RO NRC Exam

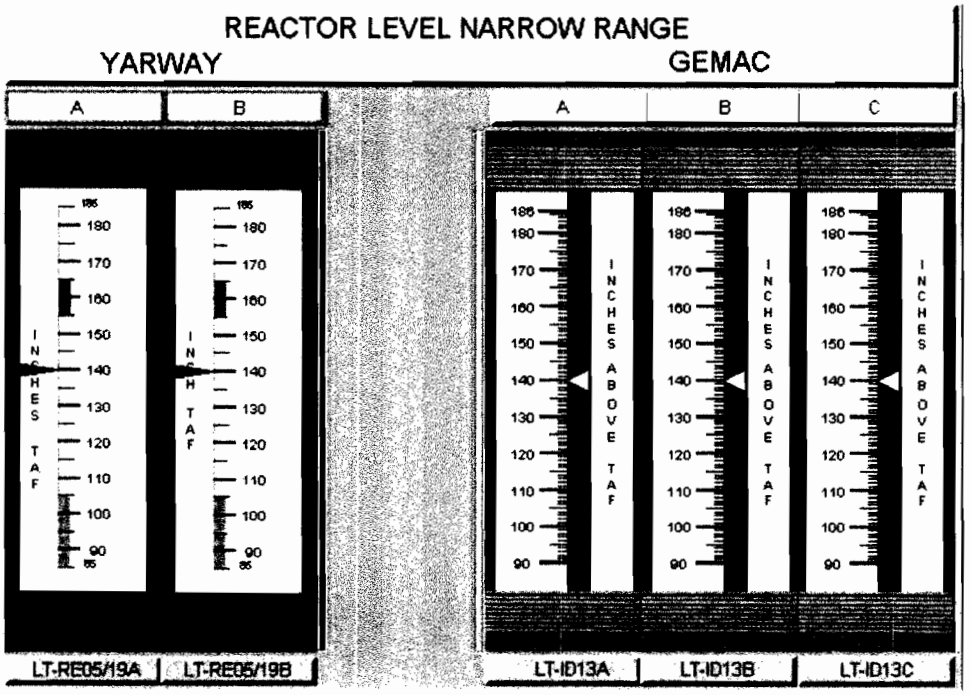
71 **ID: 11-1 NRO 71** **Points: 1.00**

Which of the following sets of indications would require entry into an EOP?

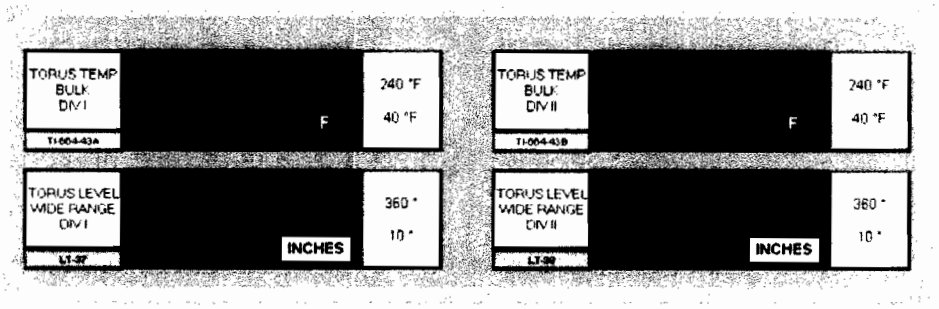
A.



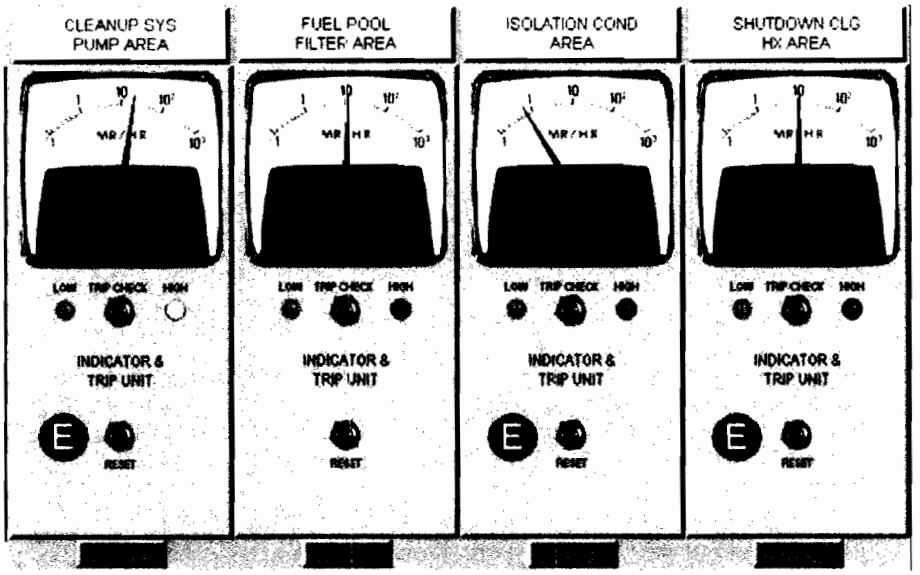
B.


REACTOR LEVEL NARROW RANGE
YARWAY
GEMAC
A
B
A
B
C
INCHES TAF
INCHES ABOVE TAF
LT-RE05/19A
LT-RE05/19B
LT-ID13A
LT-ID13B
LT-ID13C

C.


TORUS TEMP BULK DIV I
240 °F
40 °F
F
TORUS TEMP BULK DIV II
TORUS LEVEL WIDE RANGE DIV I
360 "
10 "
INCHES
TORUS LEVEL WIDE RANGE DIV II

D.



Answer: D

Answer Explanation

QID: 11-1 NRO 71		
Question #	**71**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information		
K&A	**Importance Rating**	
	RO	**SRO**
Radiation Control **2.3.5 - Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.**	**2.9**	**2.9**

Level	**RO**	**Tier**	**3**	**Category**	**RPT**
General References	**SCC EOP**				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	**D is Correct. This picture shows that CLEANUP SYS PUMP AREA is in the Alarm condition and also above the EOP entry condition of 15 mR/hr which is an entry into. This question examines the K/A by having the student interpret fixed radiation monitor indication and also determine that an EOP entry into Secondary Containment Control has been met.** **A is Incorrect but plausible if the applicant does not read the indications provided correctly. This picture shows Reactor Pressure at 1035#. The entry condition into RPV Control - no ATWS is 1045#.** **B is Incorrect but plausible if the applicant does not read the indications provided correctly. This picture shows all RPV water levels at 140". The EOP entry condition into RPV Control - no ATWS is 138".** **C is Incorrect but plausible if the applicant does not read the indications provided correctly. This picture shows Torus water level at 153" and Torus Temperature at 85F. The EOP entry into Primary Containment Control is a Torus water temperature >95F or Torus water level >154".**
References to be provided during exam:	**None**
Lesson Plan	**2621.830.0.0015, Radiation Control - Admin**
Learning Objective/	**2.3.5, Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.**

Question Source (New, Modified, Bank)			**Bank**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**	**811747** **ILT Bank** **No**			
Cognitive Level	**Memory or Fundamental Knowledge**		**Comprehension or Analysis**	**X** **3:SPK**
	NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			

EXAMINATION ANSWER KEY

OC RO NRC Exam

10CRF55 Content	**55.41b**	**11**	**55.43b**	
	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.:	**N/A**	**PRA:**	**No**	
Safety Function:	**N/A**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

72 **ID: 11-1 NRO 72** **Points: 1.00**

The plant was shutdown and was cooling down with the Shutdown Cooling System. Present plant conditions are as follows:

- RPV water level indicates 160" and steady
- E RECIRC PUMP SUCTION TEMP indicates 300 °F and lowering slowly
- Shutdown Cooling Loops A and B are in service

The Operator then reported that Drywell pressure was rising slowly and that UNIDENTIFIED DRYWELL LEAKAGE rose and steadied out at 8 GPM.

10 minutes later, and with UNIDENTIFIED DRYWELL LEAKAGE **UNCHANGED**, the following annunciators alarmed:

- DW PRESS HI-HI I
- DW PRESS HI-HI II

Which of the following actions will have the **GREATEST** affect on **PREVENTING** steam line flooding?

A. Close all LFRVs

B. Trip all Condensate Pumps

C. Place Core Spray Parallel Isolation Valves in CLOSE

D. Override Core Spray signals and place Core Spray Pumps in STOP

Answer: D

Answer Explanation

QID: 11-1 NRO 72		
Question #	**72**	**Developer / Date: JJR / 5-14-2012**

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

EXAMINATION ANSWER KEY

OC RO NRC Exam

Emergency Procedures / Plan 2.4.9 - 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	**RO**	**Tier**	**3**	**Category**	**EOP**
General References	**201**		**EMG-SP10**		
Explanation	**D is Correct. The plant is shutdown and cooling down with SDC. At a coolant temperature of 300 °F, this equates to an RPV pressure of 53 psig. At this reactor power level, feedwater flow is minimal (one condensate pump running through a LFRV). A leak then occurs in the drywell and steadies out at 8 gpm, when the drywell pressure scram and isolation setpoint is reached (as provided by the given annunciators). This same parameter results in the start of core spray, and since RPV pressure is < 305 psig, the core spray parallel isolation valves will open immediately. At this pressure, each loop of core spray will inject several thousand GPM to the RPV. To stop core spray with an initiation signal present, the signals must first be overridden, then the core spray pumps can be stopped. Since core spray is adding water to the RPV at the largest rate, as compared to condensate, then securing core spray has the largest impact on controlling RPV water level. A & B are Incorrect but plausible since closing the only in-service LFRV and stopping the only running condensate pump are very similar in their impacts, but their flow is much less than core spray. C is Incorrect but plausible. Because there is a core spray initiation signal present, placing the core spray parallel isolation valve switches to close will not result in the valves going and remaining closed.**				
References to be provided during exam:	**Att 201-7**				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Lesson Plan	**2621.828.0.0010, Core Spray System**
Learning Objective/	**CSS-10446, Identify and explain system operating controls and indications under all plant operating conditions.**

Question Source (New, Modified, Bank)			**Bank**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**663328** **ILT 08-1 NRC Exam** **No**		
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	**55.41b**	**10**	**55.43b**	
	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**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC RO NRC Exam

73 **ID: 11-1 NRO 73** **Points: 1.00**

The plant was at rated power when a spontaneous fire erupted in the Reactor Building.

Which of the following is the **LOWEST** Emergency Classification Level that, if declared, requires activation of **BOTH** the Technical Support Center (TSC) and Emergency Operations Facility (EOF) from this event?

A. Unusual Event

B. Alert

C. Site Area Emergency

D. General Emergency

Answer: B

Answer Explanation

QID: 11-1 NRO 73		
Question #	**73**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
Emergency Procedures / Plan 2.4.42 - Knowledge of emergency response facilities.				**2.6**	**3.8**
Level	**RO**	**Tier**	**3**	**Category**	**EOP**
General References	**EP-AA-1010**				

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	B is Correct. The lowest Emergency Plan classification that will result in requiring activation of both the TSC and EOF from a spontaneous fire is an Alert. This is specified as spontaneous so the applicant does not think it was due to a security issue (the TSC and EOF are activated at the Unusual Event level for security threats). All distractors are Incorrect but plausible if the applicant cannot recall when both the TSC and EOF are required to be activated.
References to be provided during exam:	None
Lesson Plan Learning Objective/	2621.830.0.0016, Emergency Procedures / Plan - Admin 2.4.42 - Knowledge of emergency response facilities.

Question Source (New, Modified, Bank)			New	
If Bank or Modified VISION System/Question ID: Question Source: Previous 2 Exams:		N/A		
Cognitive Level	Memory or Fundamental Knowledge	X 1:P	Comprehension or Analysis	
	NUREG 1021 Appendix B: Procedure steps and cautions			
10CRF55 Content	55.41b	10	55.43b	
	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	

EXAMINATION ANSWER KEY

OC RO NRC Exam

Safety Function:	**N/A**	☒ **Initial License Level** ☐ **LORT**

EXAMINATION ANSWER KEY

OC RO NRC Exam

74 **ID: 11-1 NRO 74** **Points: 1.00**

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

- Annunciator DW PRESS HI/LO is in alarm
- Drywell Pressure indicates 1.4 psig and rising slowly

The BOP is executing RAP-C3f, DW PRESS HI/LO. IAW station procedures, which of the following is the correct way to communicate Drywell pressure to the Crew?

The BOP will raise one hand announce the following...

A. "Attention for a brief, Drywell Pressure is 1.4 psig and rising slowly, end of brief."

B. "Attention for an update, Drywell Pressure is 1.4 psig and rising slowly, end of update."

C. "Attention for a brief, Drywell Pressure is 1.4 psig and increasing slowly, end of brief."

D. "Attention for an update, Drywell Pressure is 1.4 psig and increasing slowly, end of update."

Answer: B

Answer Explanation		
QID: 11-1 NRO 74		
Question #	**74**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
Conduct of Operations **2.1.38 - Knowledge of the station's requirements for verbal communications when implementing procedures.**				**3.7**	**3.8**
Level	**RO**	**Tier**	**3**	**Category**	**COO**

EXAMINATION ANSWER KEY

OC RO NRC Exam

General References	**OP-OC-101-111-1001**	**HU-AA-101**	
Explanation	**B is Correct. There are two types of formally communicate plant status/parameters to the crew. One is a crew 'update'; the second is a crew 'brief'. An update is used to communicate a specific parameter or parameters to the crew, without any comments from crew members and a brief is used to communicate parameters/plant evolutions where crew feedback is solicited. IAW OP-OC-101-1001 and HU-AA-101, when reporting a plant parameter, the correct communication must be to report the VALUE (with units), direction of TREND (up, down, rising, steady, etc.), and RATE (slow, fast, slowly, etc.) of trend. It is not acceptable to use trends such as increase or decrease. The BOP will call for an update by raising one hand and saying "Attention for an update, (report parameter, value, and trend), end of update."** **All distractors are Incorrect but plausible if the applicant does not recall the stations communications requirements of OP-OC-101-1001 and HU-AA-101.**		
References to be provided during exam:	**None**		
Lesson Plan	**2621.830.0.0017, Conduct of Operations - Admin**		
Learning Objective/	**2.1.38 - Knowledge of the station's requirements for verbal communications when implementing procedures.**		

Question Source (New, Modified, Bank)			**New**	
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:	**N/A**			
Cognitive Level	**Memory or Fundamental Knowledge**	**X 1:P**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: <u>P</u>rocedure steps and cautions			

EXAMINATION ANSWER KEY

OC RO NRC Exam

10CRF55 Content	55.41b	10	55.43b	
	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	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC RO NRC Exam

75 **ID: 11-1 NRO 75** **Points: 1.00**

Which of the following activities could result in **INTERNAL** radioactive contamination to workers in the Reactor Building?

A. Initiating the Isolation Condensers for an RPV cooldown.

B. Venting the Torus through the hardened vent post-LOCA.

C. Opening the Individual Scram Test Switches during an ATWS.

D. De-energizing the Scram Solenoids during an ATWS with the Scram buttons.

Answer: C

Answer Explanation

QID: 11-1 NRO 75		
Question #	75	Developer / Date: JJR / 5-14-2012

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
Radiation Control 2.3.14 - Knowledge of radiation or containment hazards that may arise during normal, abnormal, or emergency conditions or activities.				3.4	3.8
Level	RO	Tier	3	Category	EQC
General References	EMG-SP21	EOP User's Guide			

EXAMINATION ANSWER KEY

OC RO NRC Exam

Explanation	C is Correct. IAW the reference, when opening the scram test switches, potentially radioactive steam may be released and RB airborne concentration levels may increase. Increased airborne radioactivity could lead to internal radioactive contamination. All distractors are Incorrect but plausible if the applicant does not recall plant evolutions which can result in airborne radioactivity. The distractors may lead to increased external dose in the RB, or elevated internal contamination outside the RB.
References to be provided during exam:	None
Lesson Plan	2621.845.0.0053, RPV Control - with ATWS
Learning Objective/	EWA-03056, Given a copy of RPV Control, 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: Question Source: Previous 2 Exams:	718247 ILT Bank No			
Cognitive Level	Memory or Fundamental Knowledge	X 1:I	Comprehension or Analysis	
	NUREG 1021 Appendix B: Interlocks, setpoints, or system (singular) response			
10CRF55 Content	55.41b	12	55.43b	
	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	

EXAMINATION ANSWER KEY

OC RO NRC Exam

Safety Function:	**N/A**	☒ **Initial License Level** ☐ **LORT**

EXAMINATION ANSWER KEY

OC SRO NRC Exam

1 **ID: 11-1 NSRO 01** **Points: 1.00**

The plant is shutdown for a refuel outage, with fuel moves in progress. An event occurred as shown by the following time-line.

At 1020; The following annunciators have alarmed:

- AREA MON HI
- CRIT MON C5 HI
- NORTH WALL C10 HI
- NORTH WALL C9 HI VENT TRIP
- OPER FLOOR B9 HI VENT TRIP

At 1021; An Operator observes the following:

- All refuel floor radiation monitors have the HIGH light lit and that Radiation Monitor B9, REACTOR OPEN FLR EQUIP HATCH, indicates upscale.
- Main Stack RAGEMS indicates 4.0 E+00 cps

At 1023; The refuel floor SRO notifies the control room that the loaded hoist became separated from the bridge and has fallen into the core area.

What is the correct emergency plan classification, if any, for these conditions?

A. None

B. Unusual Event

C. Alert

D. Site Area Emergency

Answer: C

Answer Explanation		
QID: 11-1 NSRO 01		
Question #	**1S**	**Developer / Date: JJR / 5-14-2012**

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

EXAMINATION ANSWER KEY

OC SRO NRC Exam

295023 Refueling Acc Cooling Mode / 8 AA2.05 - Ability to determine and/or interpret the following as they apply to REFUELING ACCIDENTS : Entry conditions of emergency plan			3.2		4.6
Level	**SRO**	**Tier**	**1**	**Group**	**1**
General References	**EP-AA-1010 rev. 3**				
Explanation	**C is Correct. For the given conditions, the applicant must declare an Alert, RA2, on the Cold Matrix, due to a valid reading of >1000 mR/hr or upscale reading on one or more of the radiation monitors.** **All distractors are Incorrect but plausible if the applicant does not recognize the correct EAL classification. Site Area Emergency is plausible if the applicant does not correctly interpret the indications provided. An SAE would be correct if Main Stack RAGEMS were at 4.0 E+00 µCi/cc HRM, not 4.0 E+00 cps (which are the units for the Low Range Monitor).**				
References to be provided during exam:	**EAL Cold Matrix**				
Lesson Plan **Learning Objective/**	**2621.812.0.0003, Refueling** **RFL-326, State actions required in the event of unexplained criticality or high SRM counts.**				

Question Source (New, Modified, Bank)	Modified
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**	 **608369** **ILT Bank** **No**

EXAMINATION ANSWER KEY

OC SRO NRC Exam

Cognitive Level	**Memory or Fundamental Knowledge**		**Comprehension or Analysis**	**X 3:SPR**
	NUREG 1021 Appendix B: Solve a Problem using References			
10CRF55 Content	**55.41b**		**55.43b**	**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.:	**295023**	**PRA:**	**No**	
Safety Function:	**8**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

2 **ID: 11-1 NSRO 02** **Points: 1.00**

The plant was at rated power when an event occurred. Present plant conditions include the following:

- All control rods indicate full-in
- RPV water level indicates 35" and lowering
- RPV pressure indicates 465 psig and lowering slowly
- Drywell pressure indicates 18 psig and is being controlled with Drywell Sprays
- Both Startup Transformers have failed to energize their respective busses
- All Core Spray Pumps have failed
- Standby Liquid Control System 2 is injecting into the RPV
- One alternate subsystem is lined-up to Core Spray 1, and a second alternate subsystem is lined up to Core Spray 2

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

A. When RPV water level lowers to 0", direct entry into the Steam Cooling EOP.

B. When RPV water level lowers to -20", direct entry into the SAMG for Primary Containment Flooding.

C. Rapidly depressurize the RPV using the turbine bypass valves to allow Fire Water to inject into the RPV.

D. When RPV water level lowers to 0", direct entry into the Emergency Depressurization - No ATWS EOP.

Answer: D

Answer Explanation		
QID: 11-1 NSRO 02		
Question #	**2S**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information		
K&A	**Importance Rating**	
	RO	**SRO**
295031 Reactor Low Water Level / 2 EA2.04 - Ability to determine and/or interpret the following as they apply to REACTOR LOW WATER LEVEL : Adequate core cooling	**4.6**	**4.8**

EXAMINATION ANSWER KEY

OC SRO NRC Exam

Level	SRO	Tier	1	Group	1
General References	RPVC - no ATWS EOP				
Explanation	D is Correct. The plant was at rated power when an event occurred. The present plant conditions show that RPV water level is 35" and lowering, offsite power has been lost, and no core spray pumps are available for RPV injection. Firewater to Core Spray, a RPV alternate subsystem injection source, is lined-up. With firewater lined-up to core spray, the guiding support procedure directs opening the core spray parallel isolation valves to allow flow, when RPV pressure drops below 310 psig. Since RPV pressure is above this pressure, and RPV water level is currently lowering, it will continue to lower until the isolation valves are opened. IAW the RPV Control - no ATWS EOP, under these circumstances (with no core spray and no condensate, and any injection source lined-up and running), <u>when RPV water level lowers to 0", then emergency depressurization is required to assure adequate core cooling</u>. A is Incorrect but plausible. Entry into the Steam Cooling EOP would be required when RPV water level reaches 0" if no RPV injection sources are lined-up and running. B is Incorrect but plausible. Answer C could be a correct direction, but a decision prior to lowering to -20" must be made first. Thus, this would not be the NEXT direction as asked for in the question. C is Incorrect but plausible. If core spray or condensate were available for RPV injection, then directing an RPV pressure reduction to allow these low pressure systems to inject would be correct. But with no condensate or core spray, the direction is incorrect.				
References to be provided during exam:	None				

EXAMINATION ANSWER KEY

OC SRO NRC Exam

Lesson Plan	**2621.845.0.0052, RPV Control - no ATWS**
Learning Objective/	**ENA-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:** **Previous 2 Exams:**		**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	**55.41b**		**55.43b**	**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**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

3 **ID: 11-1 NSRO 03** **Points: 1.00**

The plant was shutting down for an outage, with the following conditions:

- RPV coolant temperature is 320 °F and lowering
- Shutdown Cooling pumps A and B are in service with a combined total SDC system flow of 4000 GPM
- RBCCW flow through each of the in-service SDC heat exchangers is 1000 GPM
- Shutdown Cooling pump C is tagged out of service
- All Reactor Recirculation pumps are running
- RPV water level is being maintained at 155" TAF

The following annunciator then came into alarm:

- SHUT DN CLG - PUMP B TRIP

The new plant conditions are as follows:

- Shutdown Cooling flow has been verified at 2000 GPM
- Investigation shows that the SDC pump B tripped on over-current

Which of the following lists the required action to raise RPV cooling?

A. Initiate an alternate RPV cooldown IAW ABN-3, Loss of Shutdown Cooling.

B. Raise RPV water level to above 170" TAF IAW procedure 305, Shutdown Cooling System Operation.

C. Maximize SDC loop A flow to no more than 3400 GPM IAW procedure 305, Shutdown Cooling System Operation.

D. Maximize RBCCW cooling water flow through the SDC loop A heat exchanger to no more than 2000 GPM IAW procedure 309.2, Reactor Building Closed Cooling Water System.

Answer: C

Answer Explanation		
QID: 11-1 NSRO 03		
Question #	**3S**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information

EXAMINATION ANSWER KEY

OC SRO NRC Exam

K&A				Importance Rating	
				RO	SRO
295021 Loss of Shutdown Cooling / 4 AA2.02 - Ability to determine and/or interpret the following as they apply to LOSS OF SHUTDOWN COOLING : RHR/shutdown cooling system flow				3.4	3.4
Level	SRO	Tier	1	Group	1
General References	305				
Explanation	Initial conditions indicate a partial loss of shutdown cooling flow. The RAP for the tripped SDC pump directs another pump be started if possible (which is not possible). C is Correct. Procedure 305 explains how to place SDC in service. The SDC pump discharge valves are throttled to establish the desired cooldown rate. The same procedure sets a limit on SDC flow of 3400 GPM through a heat exchanger. Since current SDC flow is only 2000 GPM, then SDC flow can be increased up to 3400 GPM. A is Incorrect but plausible. Initiating alternate cooling through the cleanup system is only performed when all SDC flow is lost or cannot be established, IAW ABN-3. B is Incorrect but plausible. IAW procedure 305, with reactor recirc pumps running, RPV water level should be maintained within the normal band. Raising water level is only required during a partial SDC flow loss when no reactor recirc pumps are running. D is Incorrect. In both procedures 309.2 and 305, it stipulates that RBCCW cannot exceed 1500 GPM through a SDC heat exchanger.				
References to be provided during exam:	ABN-3				

EXAMINATION ANSWER KEY

OC SRO NRC Exam

Lesson Plan	**2621.828.0.0045, Shutdown Cooling System**
Learning Objective/	**SDC-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, EOP & EOP support procedures and EP procedures.**

Question Source (New, Modified, Bank)			**Bank**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**510950** **ILT 05-1 SRO NRC Exam** **No**		
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	**55.41b**		**55.43b**	**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**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

4 **ID: 11-1 NSRO 04** **Points: 1.00**

IF Torus water temperature exceeds 95°F while at power, what action is required per Tech Specs **AND** what is the Tech Spec basis for the 95°F limit? (Assume **NO** EMRV testing is in progress)

	TS Action	**TS Bases**
A.	Be in COLD SHUTDOWN within 24 hours	Ensure that the maximum peak Torus temperature does not exceed 110°F if an ED was performed
B.	Be in COLD SHUTDOWN within 24 hours	Ensure that the maximum peak Torus temperature does not exceed 160°F if an ED was performed
C.	Be in COLD SHUTDOWN within 30 hours	Ensure that the maximum peak Torus temperature does not exceed 160°F if an ED was performed
D.	Be in COLD SHUTDOWN within 30 hours	Ensure that the maximum peak Torus temperature does not exceed 110°F if an ED was performed

Answer: B

Answer Explanation		
QID: 11-1 NSRO 04		
Question #	**4S**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information		
K&A	**Importance Rating**	
	RO	**SRO**
295026 Suppression Pool High Water Temp./ 5 2.2.25 - Equipment Control: Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	**3.2**	**4.2**

EXAMINATION ANSWER KEY

OC SRO NRC Exam

Level	SRO	Tier	1	Group	1
General References	TS 3.5.A.1		TS 3.5 Bases		
Explanation	Answer B is Correct. IAW TS 3.5.A.1, the Maximum Torus water temperature is 95F at power. TS 3.5.A.1.d states that if this limit is exceeded, be in the COLD SHUTDOWN condition within 24 hours. The basis for this action is to avoid excessive Torus loading following a depressurization using EMRVs. This is accomplished by ensuring Torus temperature does not exceed 160F following any period of EMRV operation. TS 3.5 Bases state the following in regards to maximum Torus temperature: Experimental data indicate that excessive steam condensing loads can be avoided if the peak temperature of the suppression pool is maintained below 160F during any period of relief valve operation with sonic conditions at the discharge exit. Specifications have been placed on the envelope of reactor operating conditions so that the reactor can be depressurized in a timely manner to avoid the regime of potentially high suppression chamber loadings. All distractors are Incorrect but plausible if the student does not remember the exact value of the TS limit or TS bases. The normal shutdown LCO action statement to be in Cold Shutdown if one is not given is 30 hrs. The Torus temp tech specs gives a value of 24 hrs. The candidate may not recall this making it plausible. The value of 110F is plausible if the student confuses this with the maximum temperature allowed where a reactor scram is required.				
References to be provided during exam:	None				
Lesson Plan	2621.845.0.0056, Primary Containment				
Learning Objective/	PCC-422, Given tech specs, identify and explain each LCO for the Primary Containment System under described conditions.				

Question Source (New, Modified, Bank)	Modified

EXAMINATION ANSWER KEY

OC SRO NRC Exam

If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**811770** **ILT Bank** **No**		
Cognitive Level	**Memory or Fundamental Knowledge**	**X** **1:B**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: Bases or Purpose			
10CRF55 Content	**55.41b**		**55.43b**	**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.:	**295026**	**PRA:**	**No**	
Safety Function:	**5**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

5 **ID: 11-1 NSRO 05** **Points: 1.00**

The plant is in cold shutdown and is cooling down with the Shutdown Cooling System (SDC). The following conditions currently exist:

- RECIRC PUMP SUCTION TEMPS indicates 209 °F
- The Primary Containment is still inerted
- RPV water level is 175" and steady

An event then occurs as shown in the timeline below:

0800 Annunciator RBCCW – SURGE TANK LVL HI/LO alarms
0804 The EO reports the RBCCW Surge Tank indicates 1" and lowering and the Tank makeup valve is full open
0806 The Radwaste Operator reports RB Floor Drain Sump 1-7 high level is in alarm
0808 Maintenance reports that they are unable to repair the leak
0809 The SM observes Drywell pressure at 1.7 psig and steady and Drywell temperature at 140 °F and steady
0810 The SM starts the 1-hour clock to monitor entry into EAL MA5(1)

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

A. Trip all Recirculation Pumps IAW ABN-19, RBCCW Failure Response.

B. Operate all available Drywell Coolers, IAW SP-27, Maximizing Drywell Cooling.

C. Isolate the Reactor Water Cleanup System IAW the Secondary Containment Control EOP.

D. Initiate Isolation Condensers by placing the Condensate Return DC valves to OPEN, IAW 307, Isolation Condenser System.

Answer: A

Answer Explanation		
QID: 11-1 NSRO 05		
Question #	**5S**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information	
K&A	**Importance Rating**

EXAMINATION ANSWER KEY

OC SRO NRC Exam

				RO	SRO
295018 Partial or Total Loss of CCW / 8 2.1.23 – Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.				4.3	4.4
Level	SRO	Tier	1	Group	1
General References	EP-AA-1010				
Explanation	A is Correct. The plant is < 212 °F and cooling down with SDC with all 3 SDC pumps in service. Then, indications are provided which show an unisolable leak in RBCCW (lowering surge tank level and high level in the floor drain tank, and not corrected quickly). Some time later, the SM starts the 1-hour clock for entry into emergency EAL MA5(1). This EAL entry shows that RPV temperature is > 212 °F for at least 1 hour. Therefore, RPV temperature has reached 212 °F and is rising due to the lack of RBCCW cooling to SDC. With the RBCCW leak and RPV water temperature > 212 °F, the RBCCW ABN directs that all recirculation pumps be tripped. Answer B is Incorrect but plausible. Operation of the Drywell coolers IAW SP-27 is directed from the Primary Containment Control EOP. Conditions show parameters less than the entry conditions (DW temperature & pressure) for the EOP. Thus, the SP cannot be used. Answer C is Incorrect but plausible. With a loss of RBCCW, it is suggested that RWCU be removed from service. The RB floor drain sump 1-7 is an entry into the Secondary Containment Control EOP. In the Secondary Containment Control EOP, it directs isolation of leaking systems, which in this case, is RBCCW – not RWCU. Thus isolation/removal of RWCU is directed from the loss of RBCCW ABN and not the EOP. Answer D is Incorrect but plausible. Since the RPV has lost its cooling medium and is heating up, Isolation Condensers can be used now that RPV temperature is > 212 °F. But with RPV water level > 160", initiation per the normal procedure is not allowed.				
References to be provided during exam:	EAL Cold Matrix				

EXAMINATION ANSWER KEY

OC SRO NRC Exam

Lesson Plan	**2621.828.0.0035, Reactor Building Closed Cooling Water System**
Learning Objective/	**RBC-0061, Using the procedure, identify and explain normal and emergency operations of the RBCCW System.**

Question Source (New, Modified, Bank)			**Bank**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**663617** **ILT 08-1 SRO NRC Exam** **No**		
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	**55.41b**		**55.43b**	**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.:	**295018**	**PRA:**	**No**	
Safety Function:	**8**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

6 **ID: 11-1 NSRO 06** **Points: 1.00**

The plant was at rated power when an event occurred. Plant parameters include the following:

- ESW Pump 1-2 has lost breaker indications
- The RWCU System has automatically isolated
- A control rod block exists from SDV high level

Complete the following statement which describes the required action.

The reactor shall be placed in the COLD SHUTDOWN CONDITION within **(1)** hours due to the loss of 125 VDC Distribution Center **(2)**.

	(1)	(2)
A.	30 hours	DC-B
B.	30 hours	DC-C
C.	24 hours	DC-B
D.	24 hours	DC-C

Answer: B

Answer Explanation		
QID: 11-1 NSRO 06		
Question #	6S	Developer / Date: JJR / 5-14-2012

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
295004 Partial or Total Loss of DC Pwr / 6 2.2.38 - Equipment Control: Knowledge of conditions and limitations in the facility license.				3.6	4.5
Level	SRO	Tier	1	Group	1

General References	TS 3.7	ABN-55	
Explanation	B is Correct. The indications provided are caused by a loss of 125 VDC distribution center DC-C (see ABN-55, DC Bus C And Panel/MCC Failures). TS 3.7.A.A.1.e requires DC distribution centers DC-B and DC-C to make the reactor critical. TS 3.7.B provides the following: The reactor shall be PLACED IN the COLD SHUTDOWN CONDITION if the availability of power falls below that required by Specification A above, except that...(3 conditions which do not apply). OP-OC-100, Oyster Creek Conduct of Operations, states that for the for the statement requiring the plant be placed in the COLD SHUTDOWN CONDITION, with no time interval provided, that the plant be placed in cold shutdown in 30 hours. Only answer B provides the correct DC Bus loss and the correct TS requirement. IAW section 2.C.(2) of the Facility License, Technical Specifications are part of the Facility License at Oyster Creek. References are not provided for this question raising the difficulty level of the question. All distractors are Incorrect but plausible if the applicant does not recall the correct LCO or recognize which DC power supply was lost.		
References to be provided during exam:	None		
Lesson Plan	2621.828.0.0012, DC Distribution		
Learning Objective/	DCD-10451 Given Technical Specifications, identify and explain associated actions for each section of the Technical Specifications relating to this system, including personnel allocation and equipment operation.		

Question Source (New, Modified, Bank)	Bank
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:	 608160 ILT Bank No

EXAMINATION ANSWER KEY

OC SRO NRC 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	**55.41b**		**55.43b**	**1**
	Conditions and limitations in the facility license.			
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**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

7 **ID: 11-1 NSRO 07** **Points: 1.00**

The plant is at rated power when a fire started inside a back panel (confirmed fire at time 1100). The Shift Manager declares that a Control Room Evacuation was required.

The following actions were performed prior to evacuation:

- The reactor was scrammed (all rods in)
- The Recirculation Pumps were tripped
- The MSIVs were closed
- The Feedwater Pumps were tripped

The following conditions have occurred:

- The Control Room evacuation was initiated at 1105 and completed at 1110
- Control of the Local Shutdown Panels and the Remote Shutdown Panel was delayed until 1135
- The Shift Manager declared at this time (1135) that the Operators have control of the plant
- The Fire Brigade reports that the Control Room fire is extinguished at 1140 and several panels are heavily damaged

What is the **HIGHEST** emergency plan classification required for this event?

A. HU6

B. HA4

C. HA6

D. HS4

Answer: D

Answer Explanation		
QID: 11-1 NSRO 07		
Question #	**7S**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information		
K&A	**Importance Rating**	
	RO	**SRO**
600000 Plant Fire On-site / 8 **2.4.29 – Knowledge of the emergency plan.**	**3.1**	**4.4**

EXAMINATION ANSWER KEY

OC SRO NRC Exam

Level	SRO	Tier	1	Group	1
General References	EP-AA-1010		ABN-30		
Explanation	D is Correct. Plant conditions provided show a fire in the Control Room requiring an evacuation and implementation of the Emergency Plan. IAW EP-AA-1010, a site area emergency is required if a control room evacuation is initiated and control of the plant cannot be established in < 15 minutes per ABN-30, Control Room Evacuation (HS4). The highest classification due to the fire is an alert (HA6). All distractors are Incorrect but plausible if the applicant does not interpret the correct EAL based on plant conditions provided.				
References to be provided during exam:	EAL Hot Matrix				
Lesson Plan	2621.828.0.0019, Fire Protection				
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, EOP & EOP support procedures and EP procedures.				

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified VISION System/Question ID: Question Source: Previous 2 Exams:	609239 ILT Bank No			
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPR
	NUREG 1021 Appendix B: Solve a Problem using References			

EXAMINATION ANSWER KEY

OC SRO NRC Exam

10CRF55 Content	**55.41b**		**55.43b**	**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.:	**600000**	**PRA:**	**No**	
Safety Function:	**8**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

8 **ID: 11-1 NSRO 08** **Points: 1.00**

The plant was at rated power when a **TOTAL** loss of Feed and Condensate occurred. Plant conditions include the following:

- ALL Control Rods are full in
- ALL MSIVs are closed
- BOTH Isolation Condensers are unavailable
- The B CRD Pump is unavailable
- The A CRD Pump is in operation IAW SP-3, CRD System Operation
- Drywell Pressure is 2.2 psig
- Reactor Pressure is 340 psig
- Torus Temperature is 108 °F
- Plant Cooldown is in progress utilizing SP-14, ALTERNATE PRESSURE CONTROL SYSTEMS CLEAN-UP IN LETDOWN MODE
- Letdown flowrate is 100 GPM
- RPV water level is 95" and lowering

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

A. Bypass ADS Timers IAW RPV Control - no ATWS prior to reaching 91" RPV water level.

B. Place the Shutdown Cooling System in service IAW 305, Shutdown Cooling System Operation.

C. Initiate boron injection IAW SP-22, Initiating The Liquid Poison System, prior to Torus Temperature reaching 110 °F

D. Secure from the plant Cooldown IAW SP-14, Alternate Pressure Control Systems, Clean-Up In Letdown Mode, prior to reaching 91" RPV water level.

Answer: D

Answer Explanation		
QID: 11-1 NSRO 08		
Question #	**8S**	**Developer / Date: JJR / 5-14-2012**

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

EXAMINATION ANSWER KEY

OC SRO NRC Exam

295009 Low Reactor Water Level / 2 AA2.03 - Ability to determine and/or interpret the following as they apply to LOW REACTOR WATER LEVEL: Reactor water cleanup blowdown rate				**2.9**	**2.9**
Level	**SRO**	**Tier**	**1**	**Group**	**2**
General References	**RPVC - no ATWS EOP**		**EOP User's Guide**		**EMG-SP14**
Explanation	**D is Correct. The question stem describes a condition where a plant cooldown has commenced via the RWCU (Reactor Water Cleanup) letdown system (letdown is the terminology used at Oyster Creek for RWCU blowdown). The RWCU system is required to be in operation to utilize the letdown function. At 91" (instrument setpoint) the RWCU system will automatically isolate on RPV Lo-Lo setpoint. The correct decision the SRO shall direct next would be to secure letdown. A is Incorrect but plausible. If RPV water level continued to lower the SRO would direct actions required by RPV Level Restoration. The first action required is to Bypass the ADS Timers, however this is only if level cannot be maintained >61", not 91". With the 'A' CRD pump still available, the next action would be for the SRO to secure RWCU letdown and re-evaluate whether the one CRD pump is enough to make up to RPV inventory losses before entering level restoration. B is Incorrect but plausible if the applicant does not recognize the plant does not meet conditions for satisfying the Shutdown Cooling interlocks. RPV temperature is required to be below 350F, which corresponds to an RPV pressure of approximately 120 psig. C is Incorrect but plausible if the applicant doesn't recall the correct procedure for initiating Liquid Poison for RPV inventory. The applicant could direct initiating Liquid Poison IAW SP-7, but SP-22 is used for injecting Liquid Poison for maintaining Torus Temperature below the BIIT curve. In addition, to utilize SP-14, boron injection is required to be secured so securing RWCU letdown would be performed before injecting Liquid Poison.**				

EXAMINATION ANSWER KEY

OC SRO NRC Exam

References to be provided during exam:	Att 201-7 (steam tables)		
Lesson Plan	2621.845.0.0052, RPV Control - with ATWS		
Learning Objective/	ENA-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)			New	
If Bank or Modified VISION System/Question ID: Question Source: Previous 2 Exams:			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	55.41b		55.43b	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.:	295009	PRA:	No	
Safety Function:	2	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

9 **ID: 11-1 NSRO 09** **Points: 1.00**

The plant is at rated power when indications and local reports confirm an earthquake has just occurred.

5 minutes later, the following events occur:

- TORUS LEVEL HI/LO annunciator alarms
- The Operator reports that TORUS LEVEL WIDE RANGE indicates 139" and lowering
- The EO calls the Control Room and reports flooding in the NW RB corner room from a Core Spray Pump line break, and that water level in the room is above the MAX SAFE value

At the direction of the US, the Operator closes the Core Spray Pumps A/C suction valves and Torus water level stabilizes at 135".

Which **ONE** of the following is the SRO **REQUIRED** to direct **NEXT**?

A. Manually scram the reactor, IAW ABN-38, Station Seismic Event.

B. Initiate a manual reactor shutdown, IAW the Primary Containment Control EOP.

C. Emergency Depressurize the RPV, IAW the Secondary Containment Control EOP.

D. Anticipate Emergency Depressurization, IAW the Primary Containment Control EOP.

Answer: A

Answer Explanation		
QID: 11-1 NSRO 09		
Question #	**9S**	**Developer / Date: JJR / 5-14-2012**

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

EXAMINATION ANSWER KEY

OC SRO NRC Exam

295036 Secondary Containment High Sump/Area Water Level / 5 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	**SRO**	**Tier**	**1**	**Group**	**2**
General References	**ABN-38**		**PCC EOP**		

Explanation	**A is Correct. The plant is at power when an earthquake occurs resulting in a core spray line break downstream of the core spray pump suction valve. A lowering torus water level and flooding in the NW RB Corner Room becomes evident. The applicant must utilize the appropriate ABN and EOP (reference materials used by the crew during the event) to determine the correct course of action. Two EOPs are entered – Primary Containment Control EOP, and Secondary Containment Control EOP. In the torus water level leg of the PCC EOP, a scram is required if torus water level cannot be maintained above 110". The leak is stopped at 135" (by closing the core spray suction valve). In the SCC EOP, it is necessary to recognize if a primary system is discharging into the secondary containment. In this case, it is not. The SCC EOP then directs a reactor shutdown if water level goes above the max safe value in 2 or more areas. In the question, only 1 area has flooding.** **With flooding stopped at 135" and in only one area, the EOPs do not require either a scram or reactor shutdown, however the flooding (Secondary Containment High Water Level) directly resulted in Core Spray System 1 Pumps inoperable. ABN-38, Station Seismic Event, requires a reactor scram if: 1) the seismic event caused a spurious actuation; 2) directly resulted in the inoperability of any safety system or a system required to complete a safe shutdown; or, 3) can potentially affect the public safety. The break in the core spray suction line is a direct result in the loss of a safety system from the earthquake and it is inoperable due to flooding at the MAX SAFE line in the NW Corner Room. Also, the torus leak itself was a result of the earthquake and this loss of primary containment integrity could potentially affect public health. Because of this, a manual reactor scram is required IAW the ABN, although not required by the EOPs.** **All distractors are Incorrect but plausible. A scram is required if a primary system is discharging into the reactor Building and flooding in 2 areas exceeds the max safe value, IAW the Secondary Containment Control EOP. If flooding not from a primary system exceeds the max safe value in 2 areas, then a reactor shutdown is required in the same EOP. An emergency Depressurization is required in the Primary Containment EOP if torus water level lowers to 110". The drywell vent header downcomers begin uncovered at this point and the primary containment suppression function is lost. There is no procedurally required action to perform a rapid power reduction.**

EXAMINATION ANSWER KEY

OC SRO NRC Exam

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)			Bank	
If Bank or Modified VISION System/Question ID: Question Source: Previous 2 Exams:	663639 ILT 08-1 NRC Exam No			
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	55.41b		55.43b	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.:	295036	PRA:	No	
Safety Function:	5	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

10 **ID: 11-1 NSRO 10** **Points: 1.00**

A plant startup was in-progress. The following conditions currently exist:

- All IRM Range switches are on Range 10
- The REACTOR MODE SELECTOR switch is in STARTUP

An event occurred which resulted in reduced recirculation pump flow, and **NO** operator actions have occurred. Total core flow is 30.2 x 10^6 lb/hr.

Which of the following states the correct Technical Specification requirements due to this plant condition, **AND** the basis for this requirement?

The plant shall be placed in...

A. the SHUTDOWN CONDITION within 24 hours to prevent fuel cladding failure during a LOCA.

B. COLD SHUTDOWN within 30 hours to prevent exceeding 1% plastic strain on the cladding during a transient.

C. COLD SHUTDOWN within 24 hours to prevent fuel cladding temperature from exceeding 1500 °F during a LOCA.

D. COLD SHUTDOWN within 30 hours to ensure that the Onset of Transition Boiling (OTB) does not occur during a transient while operating .

Answer: D

Answer Explanation		
QID: 11-1 NSRO 10		
Question #	**10S**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information		
K&A	**Importance Rating**	
	RO	**SRO**
295014 Inadvertent Reactivity Addition / 1 AA2.04 - Ability to determine and/or interpret the following as they apply to INADVERTENT REACTIVITY ADDITION: Violation of fuel thermal limits	**4.1**	**4.4**

EXAMINATION ANSWER KEY

OC SRO NRC Exam

Level	SRO	Tier	1	Group	2
General References	TS 3.3.H				
Explanation	D is Correct. The question stem provides a condition where an event resulted in an unexpected reduction in Recic System below that which is required by TS 3.3.H. This reduction in system flow is an inadvertent addition of negative reactivity and violates MCPR limits (MCPR limits are set to ensure OTB does not occur during transients while operating). TS 3.3.H says that a minimum flow of 39.65 x 10^6 lb/hr is required while in Range 10 of the IRMs and the Reactor Mode switch in STARTUP. This is done to ensure transient MCPR limits for operation are not violated. Because this TS does not provide any actions if exceeded, then TS 3.0.A applies, which requires the plant be placed in Cold Shutdown within 30 hours. Answer D lists the correct TS requirement and the correct basis. All distractors are Incorrect but plausible if the applicant does not recall the correct TS action or basis.				
References to be provided during exam:	TS 3.3.H pg 3.3.4 only				

EXAMINATION ANSWER KEY

OC SRO NRC Exam

Lesson Plan	**2621.850.0.0003, Overview/Highlights of Technical Specifications**
Learning Objective/	**TSX-10451, Referencing plant Technical Specifications (* from memory for Initial Candidates) and given a set of plant conditions, determine, as applicable, the:** • **Definitions*** • **Safety Limits and Bases*** • **Limiting Safety System Settings and Bases*** • **Limiting Conditions for Operation and Applicability** • **LCO Action Requirements (SRO ONLY)** • **Surveillance Requirements (SRO ONLY)** • **Design Features, Containment, Auxiliary Equipment, Administrative Controls, and Appendix B Environmental Technical Specifications (SRO ONLY)** • **Bases for Surveillance Requirements, Design Features, Containment, Auxiliary Equipment, Administrative Controls, and Appendix B Environmental Technical Specifications. (SRO ONLY)***

Question Source (New, Modified, Bank)			**Modified**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**609455** **ILT 07-1 SRO NRC Exam** **No**		
Cognitive Level	**Memory or Fundamental Knowledge**	**X** **1:B**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: Bases or purpose			
10CRF55 Content	**55.41b**		**55.43b**	**2**
	Facility operating limitations in the technical specifications and their bases.			
Justification for LORT questions with K/A values < 3.0	**N/A**			

EXAMINATION ANSWER KEY

OC SRO NRC Exam

Time to Complete: 1-2 minutes		Point Value: 1	
System ID No.:	**295014**	**PRA:**	**No**
Safety Function:	**1**	☒ **Initial License Level** ☐ **LORT**	

EXAMINATION ANSWER KEY

OC SRO NRC Exam

11 **ID: 11-1 NSRO 11** **Points: 1.00**

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

- 460V STATION POWER - 1A2 MN BRKR TRIP

Which of the following states the impact on the Core Spray System (Consider Active Components **ONLY**) and the **MOST LIMITING** Technical Specification (T.S.) action statement for the current plant conditions?

	Core Spray System 1 Inoperable Components	**Core Spray System 2 Inoperable Components**	**Most Limiting T.S. Action Statement**
A.	One Booster Pump **AND** One Main Pump	One Booster Pump **AND** One Main Pump	The reactor may remain in operation not to exceed 15 days
B.	One Booster Pump **ONLY**	One Booster Pump **ONLY**	The reactor shall be placed in the COLD SHUTDOWN CONDITION
C.	One Booster Pump **AND** One Main Pump	One Booster Pump **AND** One Main Pump	The reactor shall be placed in the COLD SHUTDOWN CONDITION
D.	One Booster Pump **ONLY**	One Booster Pump **ONLY**	The reactor may remain in operation not to exceed 15 days

Answer: B

Answer Explanation		
QID: 11-1 NSRO 11		
Question #	**11S**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
262001 AC Electrical Distribution A2.06 - Ability to (a) predict the impacts of the following on the A.C. ELECTRICAL DISTRIBUTION ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Deenergizing a plant bus				2.7	2.9
Level	SRO	Tier	2	Group	1
General References	ABN-48				
Explanation	Answer B is Correct. The annunciator in the stem describes a loss of power to USS 1A2 (which powers a core spray booster pump in each Core Spray System. System 1 includes the A/C booster pumps and System 2 includes the B/D booster pumps. When USS 1A2 is lost, 1 booster in each core spray system is lost. Also, USS 1A2 must be declared inoperable since it is unable to perform its design function. TS 3.7.B requires a cold shutdown condition action with the inoperability of Bus USS 1A2. None of the (Parallel Isolation Valves (PIVs) are directly affected by the loss of DC control power to USS 1A2, and are all still functioning. One booster pump is included in each answer choice since it is LOD-1 that one CS booster pump in each loop is powered from USS 1A2. All distractors are Incorrect but plausible. With USS 1A2 deenergized, the plant must be placed in the cold shutdown condition IAW TS 3.7. Due to Core Spray still being able to operate at designed flowrate, even with a loss of one booster pump in each system, the student may believe the plant is in a 15 day LCO from the TS 3.4 requirements with one or two non-redundant CS components in each loop inoperable. In addition, Core Spray Main Pumps are powered from 4160 VAC power and are not affected. With no reference provided the student must recall both TS 3.4 and 3.7 TS section requirements from memory, as well as which Core Spray components are affected.				

EXAMINATION ANSWER KEY

OC SRO NRC Exam

References to be provided during exam:	None	
Lesson Plan	2621.828.0.0016, Electrical Distribution	
Learning Objective/	ACD-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: Question Source: Previous 2 Exams:	811754 ILT Bank No			
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	55.41b		55.43b	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.:	262001	PRA:	No	
Safety Function:	6	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

12 **ID: 11-1 NSRO 12** **Points: 1.00**

A plant startup is in progress with the following conditions:

- RPV pressure is 750 psig and rising slowly
- RPV water level is in the normal band
- Control rods are being withdrawn
- Feedwater Pump C is in service

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

- Annunciator DW PRESS HI-HI RV46 A/B came into alarm
- RV46 A indicates upscale
- RPV water level swelled to 162" and continues to slowly rise

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: B

Answer Explanation		
QID: 11-1 NSRO 12		
Question #	**12S**	**Developer / Date: JJR / 5-14-2012**

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

EXAMINATION ANSWER KEY

OC SRO NRC Exam

212000 RPS A2.09 - 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: High containment/drywell pressure				**4.1**	**4.3**
Level	**SRO**	**Tier**	**2**	**Group**	**1**
General References	**201**		**237E566 Sh. 3**		
Explanation	**B is Correct. Under the conditions in the stem, with RPV pressure less that 825 psig (TS value), a single RPS Bus loss will result in a full reactor scram and closure of the MSIVs. A failure of Drywell pressure instrument RV46 A by itself will result in a 1/2 scram on RPS Channel 1. The correct answer is to continue pressure control IAW 201, Plant startup on the MPR. A & D are Incorrect but plausible if the applicant believes a full scram occurred due to RV46 A inserting a 1/2 scram on a RPS Channel. They might believe a full scram had occurred since this is true on a loss of power to one RPS bus at an RPV pressure < 825 psig. The High Drywell Pressure inserted a 1/2 scram, but RPS Bus 'A' still has power and a full scram did not occur. Post scram, the applicant may direct using RPV pressure control using the EMRVs and/or BPV Opening Jack. 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". In addition, the RPV Control - no ATWS procedure has not been entered.**				
References to be provided during exam:	**None**				
Lesson Plan	**t2621.828.0.0037, Reactor Protection System**				
Learning Objective/	**RPS-10445, Given a set of system indications or date, evaluate and interpret them to determine limits, trends, and system status.**				

Question Source (New, Modified, Bank)	**Modified**

EXAMINATION ANSWER KEY

OC SRO NRC Exam

If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**811856** **ILT Bank** **No**		
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	**55.41b**		**55.43b**	**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.:	**212000**	**PRA:**	**No**	
Safety Function:	**7**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

13 **ID: 11-1 NSRO 13** **Points: 1.00**

The plant is at rated power. An operator reports the feeder breaker to 125V MCC DC-2 tripped on overload.

Which **ONE** of the following is a correct statement for this condition?

A. The reactor may remain in operation for a period not to exceed 7 days, providing the 'A' Isolation Condenser is operable.

B. The reactor may remain in operation for a period not to exceed 7 days, providing the 'B' Isolation Condenser is operable.

C. The reactor may remain in operation for a period not to exceed 7 days, providing **BOTH** Isolation Condensers are operable.

D. The reactor shall be placed in the COLD SHUTDOWN condition within 30 hrs regardless of Isolation Condenser operability.

Answer: A

Answer Explanation		
QID: 11-1 NSRO 13		
Question #	**13S**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
207000 Isolation (Emergency) Condenser 2.2.40 - Equipment Control: Ability to apply Technical Specifications for a system.				**3.4**	**4.7**
Level	**SRO**	**Tier**	**2**	**Group**	**1**
General References	**TS 3.7.B.2**		**TS 3.8**		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

Explanation	**A is Correct. With a loss of DC-2, the 'B' Isolation Condenser is considered INOPERABLE. Even though DC-2 is required for plant operation and would normally require a 30hr LCO, TS 3.7.B.2 provides an exception that if the requirements of TS 3.8 are met (the 'A' Isolation Condenser being operable), plant operation may continue for a period not to exceed 7 days. Only an SRO is required to know LCO action statements, and therefore a RO would not be able to eliminate all distractors for this question.** **All distractors are Incorrect but plausible if the applicant doesn't recall the correct LCO action statement for the conditions provided.**
References to be provided during exam:	**TS 3.7.B (pg 3.7-2)**
Lesson Plan	**2621.828.0.0003, Isolation Condensers**
Learning Objective/	**ICS-08653, Referencing plant Technical Specifications (* from memory for Initial Candidates) and given a set of plant conditions, determine, as applicable, the:** • **Definitions*** • **Safety Limits and Bases*** • **Limiting Safety System Settings and Bases*** • **Limiting Conditions for Operation and Applicability** • **LCO Action Requirements (SRO ONLY)** • **Surveillance Requirements (SRO ONLY)** • **Design Features, Containment, Auxiliary Equipment, Administrative Controls, and Appendix B Environmental Technical Specifications (SRO ONLY)** • **Bases for Surveillance Requirements, Design Features, Containment, Auxiliary Equipment, Administrative Controls, and Appendix B Environmental Technical Specifications. (SRO ONLY)***

Question Source (New, Modified, Bank)			**New**	
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:		**N/A**		
Cognitive Level	**Memory or Fundamental Knowledge**		**Comprehension or Analysis**	**X 3:SPK**

EXAMINATION ANSWER KEY

OC SRO NRC Exam

	NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			
10CRF55 Content	**55.41b**		**55.43b**	**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.:	**207000**	**PRA:**	**No**	
Safety Function:	**6**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

14 **ID: 11-1 NSRO 14** **Points: 1.00**

The plant was at rated power. An event then occurred resulting in a major unisolable TBCCW leak.

The crew entered ABN-20, TBCCW FAILURE RESPONSE, and have completed all Immediate Operator Actions. Present plant conditions include the following:

- Ten Control Rods indicate position 04. All other Control rods indicate a GREEN backlight.
- RPV pressure indicates 950 psig and steady
- RPV water level indicates 159" and slowly rising
- Primary Containment parameters are normal

The operator observes on Panel 12XR that **ALL** Feed and Condensate Pump bearing temperatures indicate 220 °F and rising.

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

A. Bypass ADS Timers IAW the RPV Control - with ATWS EOP.

B. Trip **ALL** Feed Pumps **ONLY** IAW ABN-1, Reactor Scram.

C. Trip **ALL** operating Feed and Condensate Pumps IAW ABN-20, TBCCW Failure Response.

D. Secure all but **ONE** operating Feed and Condensate Pump IAW ABN-20, TBCCW Failure Response.

Answer: C

Answer Explanation		
QID: 11-1 NSRO 14		
Question #	**14S**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information		
K&A	**Importance Rating**	
	RO	**SRO**
400000 Component Cooling Water 2.4.11 – Knowledge of abnormal condition procedures.	**4.0**	**4.2**

EXAMINATION ANSWER KEY

OC SRO NRC Exam

Level	SRO	Tier	2	Group	1
General References	ABN-20				
Explanation	C is Correct. The question stem describes an event where an unisolable TBCCW leak has occurred. Immediate Operator Actions require a reactor scram and a trip of all operating recirculation pumps. Subsequent operator actions require tripping all Feed & Condensate Pumps if bearing temperatures, as indicated on Panel 12XR, are ≥195 °F. With bearing temperatures indicating 220 °F, all Feed & Condensate Pumps are required to be tripped. A is Incorrect but plausible if the applicant believes an ATWS is in progress. Bypassing the ADS timers would be the next required action of the BOP. B is Incorrect but plausible if the applicant believes the Feed Pumps should be tripped IAW ABN-1. ABN-1 requires tripping the Feed Pumps at 170". With RPV water level at 159" and slowly rising, the high bearing temperature takes priority and all Feed and Condensate Pumps must be tripped IAW ABN-20. D is Incorrect but plausible if the applicant does not recall the supplemental actions of ABN-20.				
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)	Modified
If Bank or Modified VISION System/Question ID: Question Source: Previous 2 Exams:	 718367 ILT Bank No

EXAMINATION ANSWER KEY

OC 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	**55.41b**		**55.43b**	**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.:	**400000**	**PRA:**	**No**	
Safety Function:	**8**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

15 **ID: 11-1 NSRO 15** **Points: 1.00**

The plant is at 65% power and stable. Plant conditions include the following:

- APRMs 1 and 6 are inoperable **AND** bypassed

A condition occurs and a 4th LPRM input to APRM 4 becomes inoperable and must be bypassed.

Which of the following actions is REQUIRED IAW Technical Specifications?

A. Bypass APRM 4

B. **CONFIRM** a half-scram on RPS 1

C. **CONFIRM** a half-scram on RPS 2

D. Commence a normal plant shutdown

Answer: B

Answer Explanation		
QID: 11-1 NSRO 15		
Question #	**15S**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
215005 APRM / LPRM 2.2.22 – Equipment Control: Knowledge of Limiting Conditions for operations and safety limits.				**4.0**	**4.7**
Level	**SRO**	**Tier**	**2**	**Group**	**1**
General References	**TS 3.1.B.1**		**TS Table 3.1.1**		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

Explanation	**Answer B is Correct. APRM 4 is inoperable with four failed inputs (T.S. 3.1.B.1). Since there are now less than the required minimum APRM channels (3) for RPS-1, a half-scram must be inserted on RPS-1.** **Answer A is Incorrect. It is true the crew may bypass APRM 4 however the required action per tech specs is to place/confirm a half-scram on RPS channel 1.** **Answer C is Incorrect. RPS-1 has two inoperable APRMs (1 and 4) and would be tripped. RPS-2 has one inoperable APRM (6) and would not be tripped since it meets the operability requirements of Table 3.1.1.** **Answer D is Incorrect. This action is not required and if taken, would not eliminate the requirement to trip RPS-1.** **All distractors are plausible if the student does not recall action requirements for inoperable APRMs. The only action that is REQUIRED is that RPS 1 is placed in the TRIP condition, making all distractors incorrect as these are not required actions per Technical Specifications or procedures.**
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**	
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:		**718262 ILT Bank No**		
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

OC SRO NRC Exam

10CRF55 Content	**55.41b**		**55.43b**	**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.:	**215005**	**PRA:**	**No**	
Safety Function:	**7**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

16 **ID: 11-1 NSRO 16** **Points: 1.00**

The plant was at rated power with USS 1A2 out of service. A combined LOOP and LOCA then occurred. Plant conditions include the following:

- All Control Rods indicate a GREEN-GREEN backlight
- RPV pressure is 780 psig and lowering
- RPV water level is 102" and lowering
- Torus temperature is 112° F and rising
- DW pressure is 15 psig and rising
- Drywell temperature is 282° F and rising
- EDG 1 BREAKER indicates RED light ON
- EDG 2 BREAKER indicates GREEN light ON

Which of the following is the SRO required to direct **NEXT**?

A. Emergency Depressurize the RPV, IAW the Primary Containment Control EOP.

B. Initiate one loop of Containment Spray in the TORUS CLG mode, IAW the Primary Containment Control EOP.

C. Initiate one loop of Containment Spray in the DW SPRAY mode, IAW the Primary Containment Control EOP.

D. Lower reactor pressure to allow low pressure systems to inject into the RPV, IAW the RPV Control – no ATWS EOP.

Answer: A

Answer Explanation		
QID: 11-1 NSRO 16		
Question #	**16S**	**Developer / Date: JJR / 5-14-2012**

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

EXAMINATION ANSWER KEY

OC SRO NRC Exam

223001 Primary CTMT and Aux. A2.10 - Ability to (a) predict the impacts of the following on the PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High drywell temperature				**3.6**	**3.8**
Level	**SRO**	**Tier**	**2**	**Group**	**2**
General References	**PCC EOP**	**EOP User's Guide**			
Explanation	**A is Correct. The question stem describes a combined LOOP and LOCA event. The stem shows that EDG-2 is not powering Bus 1D, therefore System 2 Containment Spray Pumps are not available. In addition, with USS 1A2 not in service, Containment Spray System 1 Pumps are also unavailable. With Drywell Temperature >281 °F and unable to be lowered, the PCC EOP directs Emergency Depressurization due to High Drywell Temperature to protect the Primary Containment. B & C are Incorrect but plausible if the applicant doesn't recognize that BOTH Containment Spray systems are unavailable. Since Torus Temperature is >95 °F, initiating Torus Cooling is required, but is not possible. Initiating Drywell Sprays is also required, however is also not possible with both Containment Spray systems unavailable. D is Incorrect but plausible if the applicant prioritizes ensuring adequate core cooling due to the LOCA. Lowering RPV pressure to allow low pressure systems to inject would be required once level restoration has been entered. This will occur when RPV water level lowers to < 61". At 102" RPV level, the only REQUIRED EOP action that is possible is to Emergency Depressurize on High Drywell Temperature.**				
References to be provided during exam:		**None**			

EXAMINATION ANSWER KEY

OC SRO NRC Exam

Lesson Plan	**2621.845.0.0056, RPV Control - no ATWS**
Learning Objective/	**PCC-3000, Using Procedure EMG-3200.02, 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:** **Previous 2 Exams:**		**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	**55.41b**		**55.43b**	**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.:	**223001**	**PRA:**	**No**	
Safety Function:	**5**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

17 **ID: 11-1 NSRO 17** **Points: 1.00**

The plant was starting up after a refuel outage. The Reactor Operator was withdrawing control rods, when the control rod position indication went dark for the control rod being withdrawn.

Control rod position indication was **NOT** regained when the URO inserted the control rod one notch. The Operator then attempted to fully insert the control rod in preparation for isolating the control rod. Neutron monitoring showed no change in counts as the control rod was inserted.

With the control rod valved out of service, IAW procedure 302.1 Control Rod Drive System, and the control rod position not known, which of the following Technical Specifications actions is required?

A. Immediately initiate action to fully insert all insertable control rods.

B. The reactor must be placed in the SHUTDOWN CONDITION within 12 hours.

C. The SHUTDOWN MARGIN must be verified within 6 hours, including the effects of the unknown-positioned control rod.

D. Verify there are no more than 8 inoperable control rods valved out of service, prior to continuing with control rod withdrawals.

Answer: C

Answer Explanation		
QID: 11-1 NSRO 17		
Question #	**17S**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
214000 RPIS **2.2.40 – Equipment Control: Ability to apply Technical Specifications for a system.**				**3.4**	**4.7**
Level	**SRO**	**Tier**	**2**	**Group**	**2**

General References	**TS 3.2.A**		
Explanation	**C is Correct. Shutdown margin is determined with the strongest reactivity control rod assumed fully withdrawn and all other control rods fully inserted. But since the control rod in the question has no position indication, and they are unable to verify that the control rod is fully inserted, its position is unknown. Because of this, shutdown margin must be verified with this control not fully inserted. This is required IAW TS 3.2.A.2.** **A is Incorrect but plausible. If SDM cannot be met while in REFUEL mode, then TS 3.2.A.5 requires that all control rods be fully inserted. The stem states a plant startup is in progress.** **B is Incorrect but plausible. Only if the SDM cannot be verified within the time allowed (6 hours), the plant must be placed in the shutdown condition within the following 12 hours IAW TS 3.2.A.3.** **D is Incorrect. TS 3.2.B.4 allows only 6 inoperable, valved out of service control rods. In any event, the startup cannot continue even if this verification was made.**		
References to be provided during exam:	**None**		
Lesson Plan	**2621.850.0.0090, Overview/Highlights of Technical Specifications**		
Learning Objective/	**TSX-10451, Referencing plant Technical Specifications (* from memory for Initial Candidates) and given a set of plant conditions, determine, as applicable, the:** • **Definitions*** • **Safety Limits and Bases*** • **Limiting Safety System Settings and Bases*** • **Limiting Conditions for Operation and Applicability** • **LCO Action Requirements (SRO ONLY)** • **Surveillance Requirements (SRO ONLY)** • **Design Features, Containment, Auxiliary Equipment, Administrative Controls, and Appendix B Environmental Technical Specifications (SRO ONLY)** • **Bases for Surveillance Requirements, Design Features, Containment, Auxiliary Equipment, Administrative Controls, and Appendix B Environmental Technical Specifications. (SRO ONLY)***		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

Question Source (New, Modified, Bank)			**Bank**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**510956** **ILT Bank** **No**		
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	**55.41b**		**55.43b**	**2 & 6**
	Facility operating limitations in the technical specifications and their bases; 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.			
Justification for LORT questions with K/A values < 3.0	**N/A**			
Time to Complete: 1-2 minutes			**Point Value: 1**	
System ID No.:	**214000**	**PRA:**	**No**	
Safety Function:	**7**	☒ **Initial License Level** ☐ **LORT**		

18 **ID: 11-1 NSRO 18** **Points: 1.00**

The plant was at rated power when an event then occurred. Ten minutes later, the following plant conditions are observed:

- APRMs indicate 8-9%
- **ALL** recirculation pumps are tripped
- RPV water level is 112" and lowering
- EMRV NR108B indicates **RED** light **ON**
- ABN-40, Stuck Open EMRV, is being executed
- Drywell pressure is 8 psig and rising slowly
- Drywell temperature is 205 °F and rising slowly
- Torus water temperature is 96 °F and rising slowly

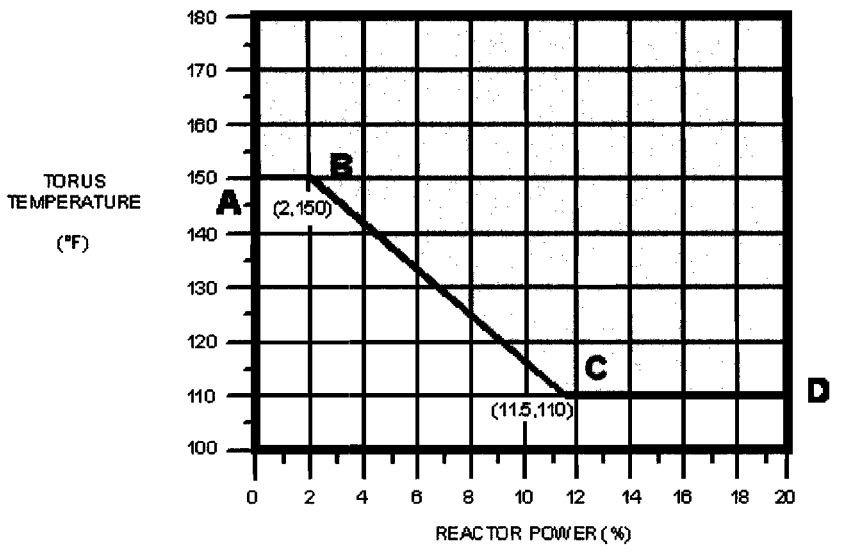
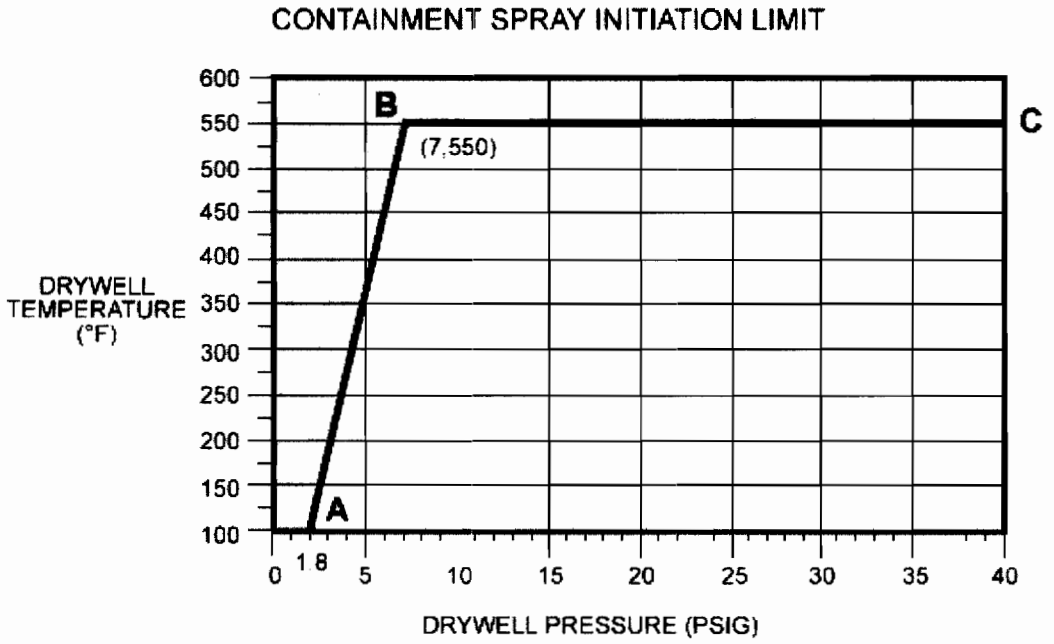


FIG. L B IIT
BORON INJECTION
INITIATION TEMPERATURE



Which of the following actions is required **AT THIS TIME**?

A. Initiate the Liquid Poison System IAW Support Procedure 22, Initiating the Liquid Poison System, in the RPV Control - with ATWS EOP.

B. Initiate Torus Cooling IAW Support Procedure 25, Initiation of the Containment Spray System in the Torus Cooling Mode, in the Primary Containment Control EOP.

C. Initiate Drywell Sprays IAW Support Procedure 29, Initiation of the Containment Spray System for Drywell Sprays, from the Pressure Leg in the Primary Containment Control EOP.

D. Restore RPV water level 138" - 175" IAW Support Procedure 19, Feedwater/Condensate and CRD System Operation, in the RPV Control - With ATWS EOP.

Answer: B

Answer Explanation
QID: 11-1 NSRO 18

EXAMINATION ANSWER KEY

OC SRO NRC Exam

Question #	18S	Developer / Date: JJR / 5-14-2012

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
219000 RHR/LPCI: Torus/Pool Cooling Mode A2.13 - Ability to (a) predict the impacts of the following on the RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High suppression pool temperature				3.5	3.7
Level	SRO	Tier	2	Group	2
General References	RPVC - with ATWS EOP	EOP User's Guide			

Explanation	**B is Correct. The plant was at rated power when an event resulted in an electrical ATWS. Indications are then provided 10 minutes after the scram: power is > 2%, 1 EMRV is stuck open resulting in an elevated torus water temperature of 97F. Containment Spray is available and Containment Spray is required to be placed in the TORUS CLG mode due to High Suppression Pool Temperature IAW the PCC EOP.** **A is Incorrect but plausible since it is true that Liquid Poison would have to be initiated to maintain Torus Temperature below the BIIT curve, however with temperature at 97F and slowly rising, the only REQUIRED action at this time is to initiate Torus Cooling. ABN-40 is still being executed and there is a chance if NR108B closes the BIIT will never be reached.** **C is Incorrect but plausible. Drywell sprays can be initiated in the Primary Containment Control EOP in 2 legs: DW temperature and DW pressure. In the temperature leg, conditions must first be allowed by the Containment Spray Initiation Limit (CSIL) curve. To spray from the pressure leg, then DW/Torus pressure must first exceed 12 psig (this is a WAIT requirement). Therefore DW sprays can be initiated from the temperature leg (as allowed by CSIL) but not the pressure leg.** **D is Incorrect but plausible. IAW the RPV Control - with ATWS EOP, RPV water level is NOT restored/maintained at 138-175, but lowered intentionally to control reactor power (Terminate and Prevent RPV Injection).**
References to be provided during exam:	**None**
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)	**New**
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**	**N/A**

EXAMINATION ANSWER KEY

OC SRO NRC Exam

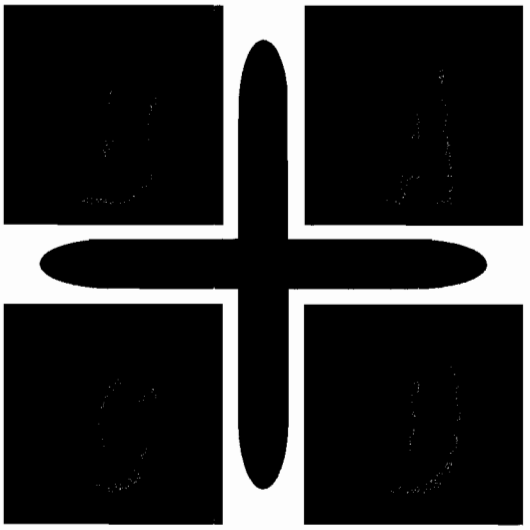
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPK
	NUREG 1021 Appendix B: Solve a Problem using Knowledge and its meaning			
10CRF55 Content	55.41b		55.43b	5
	Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency 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.:	219000	PRA:	No	
Safety Function:	5	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

19 **ID: 11-1 NSRO 19** **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

OC SRO NRC Exam

Answer: B

Answer Explanation		
QID: 11-1 NSRO 19		
Question #	19S	Developer / Date: JJR / 5-14-2012

Knowledge and Ability Reference Information					
K&A				Importance Rating	
				RO	SRO
Conduct of Operations 2.1.42 - Knowledge of new and spent fuel movement procedures.				2.5	3.4
Level	SRO	Tier	3	Category	COO
General References	205.0		205.5		
Explanation	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. All distractors are Incorrect but plausible if the applicant is not familiar with the control rod removal process during refuel activities.				
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

EXAMINATION ANSWER KEY

OC SRO NRC Exam

If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**811860** **ILT 10-1 SRO NRC Exam** **Yes**		
Cognitive Level	**Memory or Fundamental Knowledge**	**X** **1:P**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: Procedure steps and cautions			
10CRF55 Content	**55.41b**		**55.43b**	**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**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

20 **ID: 11-1 NSRO 20** **Points: 1.00**

The plant is in a refuel outage. Due to the loss of SRM 24, fuel was being shuffled in core quadrants 1, 2, and 3.

While reviewing work packages for the following day, you note a maintenance activity requiring a tagout to de-energize 24 VDC Power Panel A.

If the maintenance activity were allowed to occur as scheduled, which of the following states the impact on refueling, if any?

A. There will be **NO** impact on the core alterations.

B. Core alterations will be restricted to core quadrant 3 **ONLY**.

C. **ALL** core alterations must cease due to the loss of the required number of operable SRMs.

D. **ALL** core alterations must cease due to the loss of Secondary Containment Integrity and the auto start of SGTS.

Answer: C

Answer Explanation		
QID: 11-1 NSRO 20		
Question #	**20S**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
Equipment Control **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	**SRO**	**Tier**	**3**	**Category**	**EQC**
General References	**TS 3.9**		**706E812 sh. 3, 5, 6**		

Explanation	**C is Correct. The plant is in a refuel outage with SRM 24 inoperable. Core alterations are occurring in the other core quadrants with operable SRMs. If 24 VDC Power Panel A is de-energized, this will render SRMs 21 and 22 inoperable. TS 3.9.D provides the following: During CORE ALTERATIONS at least two (2) source range monitor (SRM) channels shall be OPERABLE and inserted to the normal operating level. One of the OPERABLE SRM channel detectors shall be located in the core quadrant where CORE ALTERATIONS are being performed, and another shall be located in an adjacent quadrant. TS 3.9.G provides the following: With any of the above requirements not met, cease CORE ALTERATIONS or control rod removal as appropriate, and initiate action to satisfy the above requirements. Since only 1 SRM remains operable in quadrant 3, the requirement for 2 operable SRMs will not be met and core alterations must cease.** **A is Incorrect but plausible since the refuel activities are impacted. The applicant may not recall the loss of 24 VDC Power Panel A would affect SRMs 21 and 22 and/or they may not recall the Tech Spec requirements for operable SRMs while performing core alterations.** **B is Incorrect but plausible. Since SRM 23, in core quadrant 3 is still operable, the candidate may think that fuel moves are still allowed in that single quadrant. But as shown, 2 SRMs are required.** **D is Incorrect but plausible. The loss of 24 VDC Power Panel will isolate RB normal Vent and initiate the Standby Gas treatment System (SGTS). This will not cause SGTS or Secondary Containment to be inoperable.**
References to be provided during exam:	**None**

EXAMINATION ANSWER KEY

OC SRO NRC Exam

Lesson Plan	**2621.828.0.0029, Nuclear Instrumentation**
Learning Objective/	**NIS-10451, Referencing plant Technical Specifications (* from memory for Initial Candidates) and given a set of plant conditions, determine, as applicable, the:** • **Definitions*** • **Safety Limits and Bases*** • **Limiting Safety System Settings and Bases*** • **Limiting Conditions for Operation and Applicability** • **LCO Action Requirements (SRO ONLY)** • **Surveillance Requirements (SRO ONLY)** • **Design Features, Containment, Auxiliary Equipment, Administrative Controls, and Appendix B Environmental Technical Specifications (SRO ONLY)** • **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:** **Question Source:** **Previous 2 Exams:**	**718376** **ILT 09-1 SRO NRC Exam** **Yes**			
Cognitive Level	**Memory or Fundamental Knowledge**		**Comprehension or Analysis**	**X** **3:PEO**
	NUREG 1021 Appendix B: Predict an Event or Outcome			
10CRF55 Content	**55.41b**		**55.43b**	**2, 6, 7**
	Facility operating limitations in the technical specifications and their bases; 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; 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**	

EXAMINATION ANSWER KEY

OC SRO NRC Exam

System ID No.:	N/A	PRA:	No
Safety Function:	N/A	☒ Initial License Level ☐ LORT	

EXAMINATION ANSWER KEY

OC SRO NRC Exam

21 **ID: 11-1 NSRO 21** **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: 11-1 NSRO 21		
Question #	**21S**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
Radiation Control **2.3.11 - Ability to control radiation releases.**				**3.8**	**4.3**
Level	**SRO**	**Tier**	**3**	**Category**	**RPT**

EXAMINATION ANSWER KEY

OC SRO NRC Exam

General References	**RR EOP**	**EOP User's Guide**	
Explanation	**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 ÄP 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.** **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.** **C is Incorrect but plausible since the Radioactivity Release Control EOP does require ED, but only after a GE is declared.** **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.**		
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:** **Previous 2 Exams:**	 **811863** **ILT 10-1 SRO NRC Exam** **Yes**

EXAMINATION ANSWER KEY

OC SRO NRC Exam

Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 3:SPR
	NUREG 1021 Appendix B: Solve a Problem using References			
10CRF55 Content	55.41b		55.43b	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	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

22 **ID: 11-1 NSRO 22** **Points: 1.00**

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

- Reactor power is 15% and steady
- RPV water level indicates -16" and lowering
- Emergency Depressurization has been performed
- SP-17, Terminate and Prevent Injection, has been completed
- RPV Pressure has just lowered below the Minimum Steam Cooling Pressure (MSCP)

IAW the RPV Control - with ATWS EOP, which of the following systems shall the SRO direct **FIRST** to restore RPV water level **AND**, IAW the EOP User's Guide, which is the correct basis for this action?

A. Feed and Condensate IAW SP-19, Feedwater/Condensate and CRD System Operation, since it injects outside the core shroud.

B. Fire Water via the Core Spray System IAW SP-20, Low Pressure Injection During an ATWS, due to its ability to be throttled and controlled.

C. Core Spray System IAW SP-20, Low Pressure Injection During an ATWS, due to its ability to restore RPV water level faster than other injection systems.

D. Condensate Transfer via the Core Spray System IAW SP-20, Low Pressure Injection During an ATWS, due to its ability to throttle and is at a higher water purity than Fire Water.

Answer: A

Answer Explanation		
QID: 11-1 NSRO 22		
Question #	**22S**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information		
K&A	**Importance Rating**	
	RO	**SRO**
Emergency Procedures / Plan **2.4.22 - Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.**	**3.6**	**4.4**

EXAMINATION ANSWER KEY

OC SRO NRC Exam

Level	SRO	Tier	3	Category	EOP
General References	RPVC - with ATWS EOP		EOP User's Guide		
Explanation	A is Correct. The question stem describes a condition where there is both a LOCA and ATWS. When ED is performed during an ATWS, pressure is allowed to lower below the MSCP, then makeup to the RPV commences via a series of preferred Safety Systems. Feed/Condensate and CRD are the FIRST priority since they inject outside the Core Shroud, allowing the cold water injected to warm and mix with borated water before entering the core. The first makeup source the SRO shall direct is Feed and Condensate. B & D are Incorrect but plausible. Fire Water and Condensate Transfer via Core Spray are one of the next sources of water in line for makeup due to their ability to be throttled. Feed and Condensate has a higher priority though due to it injecting outside the core shroud where Fire Water and Condensate Transfer would inject cold water directly on top of the core. C is Incorrect but plausible. The Core Spray system is the last source of makeup during an ATWS due to its injection of large quantities of cold unborated water injecting directly on the core.				
References to be provided during exam:	None				
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)	New
<u>If Bank or Modified</u> VISION System/Question ID: Question Source: Previous 2 Exams:	N/A

EXAMINATION ANSWER KEY

OC 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	55.41b		55.43b	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.:	N/A	PRA:	No	
Safety Function:	N/A	☒ Initial License Level ☐ LORT		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

23 **ID: 11-1 NSRO 23** **Points: 1.00**

The plant is at rated power with CRD Pump B tagged out of service to replace the pump oil.

The work order requires running surveillance test 617.4.001, CRD Pump Operability Test as a Post Maintenance Test (PMT) following work completion.

IAW MA-AA-716-012, Post Maintenance Testing, which of the following states an additional requirement for the PMT of this pump, if any?

A. **NO** other actions outside of the surveillance are required.

B. Motor current should also be monitored and documented.

C. Bearing temperatures should also be monitored and documented.

D. A VT-2 leakage inspection should be performed and documented.

Answer: C

Answer Explanation		
QID: 11-1 NSRO 23		
Question #	**23S**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
Equipment Control 2.2.19 - Knowledge of maintenance work order requirements.				**2.3**	**3.4**
Level	**SRO**	**Tier**	**3**	**Category**	**EQC**
General References	**MA-AA-716-012**	**617.4.001**			

Explanation	C is Correct. IAW MA-AA-716-012, Post Maintenance Testing, Attachment 1, Generic Post Maintenance Test Matrix, there are 3 types of tests for pump lubricant changeout: bearing temperature, external leakage, and lubrication level checks. The surveillance test does not test or verify any of these recommended actions. Of those actions listed, only answer C specifies one of the listed actions. All distractors are Incorrect but plausible if the applicant is not familiar with the requirements for PMT.

References to be provided during exam:	MA-AA-716-012 Attachment 1	617.4.001 Attachments 1-3

Lesson Plan	2621.828.0.0011, Control Rod Drive System
Learning Objective/	CRD-0021, Identify and interpret the test and surveillance procedures for the CRD System, including personnel and equipment allocation.

Question Source (New, Modified, Bank)			Bank	
If Bank or Modified VISION System/Question ID: Question Source: Previous 2 Exams:	663659 ILT 08-1 SRO NRC Exam No			
Cognitive Level	Memory or Fundamental Knowledge		Comprehension or Analysis	X 2:DR
	NUREG 1021 Appendix B: Describing or recognizing Relationships			
10CRF55 Content	55.41b		55.43b	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	

EXAMINATION ANSWER KEY

OC SRO NRC Exam

System ID No.:	N/A	PRA:	No
Safety Function:	N/A	☒ Initial License Level ☐ LORT	

24 **ID: 11-1 NSRO 24** **Points: 1.00**

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

- Six (6) Control Rods are stuck at position 04; ALL other Control Rods are at position 00
- RECIRC PUMP SUCTION TEMPS indicates 440 °F and lowering
- RPV water level indicates 134" and rising slowly
- Drywell pressure indicates 11 psig
- Drywell temperature indicates 225 °F
- Torus water temperature indicates 153 °F and rising slowly
- Torus water level indicates 160" and stable

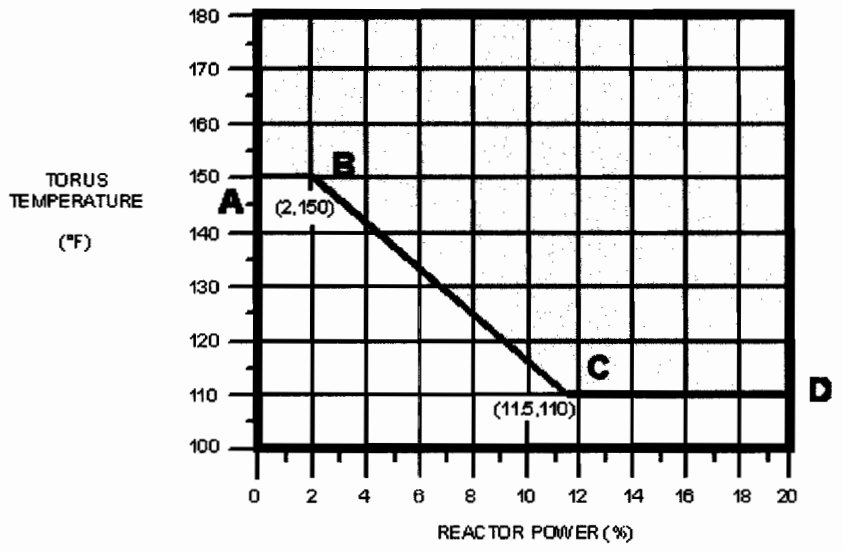
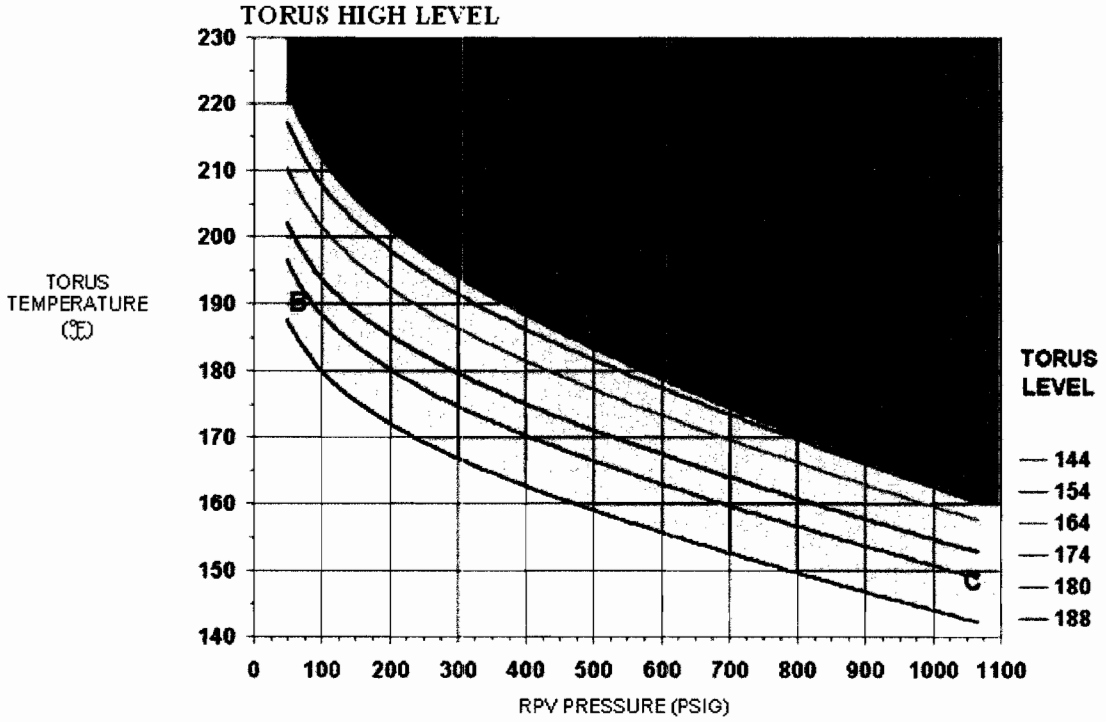
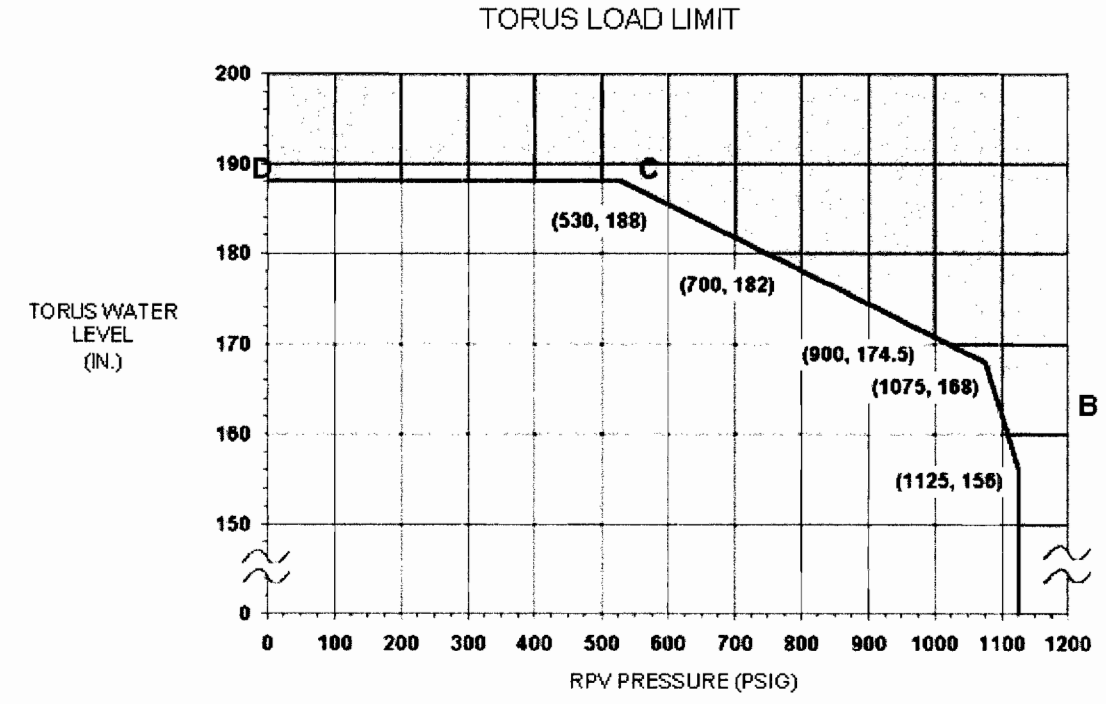
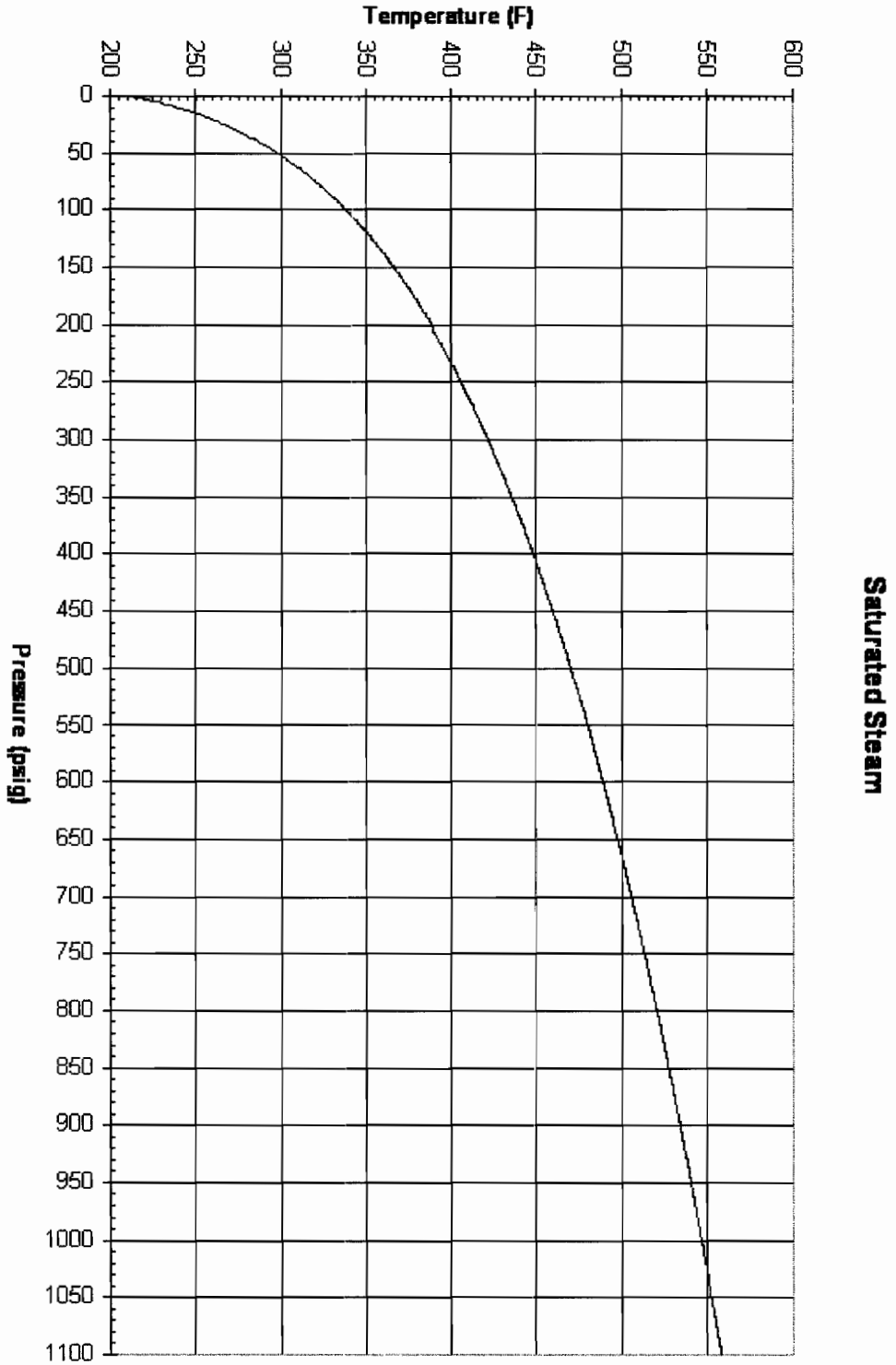


FIG. L B IIT
BORON INJECTION
INITIATION TEMPERATURE


TORUS HIGH LEVEL
TORUS TEMPERATURE (°F)
230
220
210
200
190
180
170
160
150
140
B
C
TORUS LEVEL
144
154
164
174
180
188
0
100
200
300
400
500
600
700
800
900
1000
1100
RPV PRESSURE (PSIG)


TORUS LOAD LIMIT
TORUS WATER LEVEL (IN.)
200
190
180
170
160
150
0
D
C
B
(530, 188)
(700, 182)
(900, 174.5)
(1075, 168)
(1125, 156)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
RPV PRESSURE (PSIG)


Temperature (F)
200
250
300
350
400
450
500
550
600
Pressure (psig)
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
850
900
950
1000
1050
1100
Saturated Steam

Which **ONE** of the following actions shall the SRO direct? (See EOP Figures above)

A. Initiate Liquid Poison IAW Support Procedure 22, Initiating the Liquid Poison System

B. Emergency Depressurize the RPV IAW the Emergency Depressurization – With ATWS EOP

C. Before RECIRC PUMP SUCTION TEMPS indicate about 425 °F, stop injection into the RPV from the Core Spray System, IAW the RPV Control – No ATWS EOP

D. Terminate and prevent RPV injection from sources external to the Primary Containment not required for adequate core cooling IAW the Primary Containment Control EOP

Answer: C

Answer Explanation		
QID: 11-1 NSRO 24		
Question #	**24S**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
Conduct of Operations **2.1.25 - Ability to interpret reference materials, such as graphs, curves, tables, etc.**				**3.9**	**4.2**
Level	**SRO**	**Tier**	**3**	**Category**	**COO**
General References	**RPV Control - no ATWS EOP**				

Explanation	**C is Correct. The plant was at power when an event occurred. The conditions provided require entry into the RPV Control – No ATWS and Primary Containment Control EOP. The recirculation pump suction temperature (which is trending down) shows that RPV pressure is about 375 psig and lowering. A note in the RPV Control – No ATWS EOP states that if Core Spray is running (which it is), then to secure Core Spray before RPV pressure drops to 310 psig (which equates to about 425 °F), as long as core cooling is assured. RPV water level is given as 134" and slowly rising; thus, adequate core cooling is assured. With this, and RPV pressure lowering, Core Spray should be prevented from injecting.** **A is Incorrect but plausible. The indications show that several control rods did not insert to position 00 but inserted to position 04. Under these conditions, the reactor can still be declared shutdown under all conditions and thus the RPV Control – No ATWS is the correct EOP. The conditions show that the Boron Injection Initiation Temperature (BIIT) curve is violated, and SLC should be injected if the RPV Control – With ATWS EOP was the correct EOP. Since there is no ATWS EOP entry, there is no direction to inject SLC due to violation of the BIIT curve.** **B is Incorrect but plausible. Emergency Depressurization would be required if the Heat Capacity Temperature Limit (HCTL) were violated. But the conditions show that the point is on the good side of the HCTL curve and no ED is required.** **D is Incorrect but plausible. Terminating RPV injection from those sources external to the Primary Containment not required for adequate core cooling is appropriate when the Torus Load Limit (TLL) curve is violated. The provided conditions show that TLL is not violated and thus termination of external sources is not required.**
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 – No ATWS, describe in detail each step or conditional statement, including technical basis, and how to perform each step as required.**

EXAMINATION ANSWER KEY

OC SRO NRC Exam

Question Source (New, Modified, Bank)			**Bank**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**		**663915** **ILT Bank** **No**		
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	**55.41b**		**55.43b**	**1**
	Conditions and limitations in the facility license.			
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**	☒ **Initial License Level** ☐ **LORT**		

EXAMINATION ANSWER KEY

OC SRO NRC Exam

25 **ID: 11-1 NSRO 25** **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.
- An Emergency Exposure of greater than 5 Rem TEDE is required to terminate a radioactive release.

According to EP-AA-113, Personnel Protective Actions, who must authorize the Emergency Exposure?

1. The Shift Manager in the Control Room
2. The Station Emergency Director in the TSC
3. The Corporate Emergency Director in the EOF

A. 1 **ONLY**

B. 2 **ONLY**

C. **BOTH** 1 and 2

D. **BOTH** 2 and 3

Answer: B

Answer Explanation		
QID: 11-1 NSRO 25		
Question #	**25S**	**Developer / Date: JJR / 5-14-2012**

Knowledge and Ability Reference Information					
K&A				**Importance Rating**	
				RO	**SRO**
Radiation Control **2.3.4 - Knowledge of radiation exposure limits under normal or emergency conditions.**				**3.2**	**3.7**
Level	**SRO**	**Tier**	**3**	**Category**	**RPT**

EXAMINATION ANSWER KEY

OC SRO NRC Exam

General References	**EP-AA-113**	**EP-AA-1007**	
Explanation	**B is Correct. Per EP-AA-1007 (among others), emergency exposure controls are non-delegable responsibilities that remain with the Station Emergency Director in the TSC. 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.** **All distractors are Incorrect but plausible. The Shift Manager does authorize emergency exposure limits, however only until Command and Control is transferred to the TSC. The applicant may not recall authorizing emergency exposure is a non-delegable responsibility. Since the EOF is activated, they may assume emergency exposure control authorization has now been transferred to the EOF.**		
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)			**Bank**	
If Bank or Modified **VISION System/Question ID:** **Question Source:** **Previous 2 Exams:**			**None** **Peach Bottom 2009 NRC Exam** **No**	
Cognitive Level	**Memory or Fundamental Knowledge**	**X** **1:P**	**Comprehension or Analysis**	
	NUREG 1021 Appendix B: Procedure steps and cautions			
10CRF55 Content	**55.41b**		**55.43b**	**4**

EXAMINATION ANSWER KEY

OC SRO NRC Exam

	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**	☒ **Initial License Level** ☐ **LORT**	