1. Unit 2 experienced a LOCA inside the primary containment.

   T-112 "Emergency Blowdown" is in progress with all 5 ADS Safety Relief Valves open. Current conditions are as follows:

   - RPV level is -170 inches
   - RPV pressure is 390 psig
   - Drywell pressure is 10 psig
   - All ECCS pumps are running

   Based on the above conditions, MO-2-10-25B "RHR Inboard Discharge Valve" is ____(1)____ and AO-2-10-46B "Testable Check Valve" is ____(2)____.

   A. (1) open
      (2) open

   B. (1) closed
      (2) open

   C. (1) open
      (2) closed

   D. (1) closed
      (2) closed

Answer Key		
Question # 1 RO		
Choice		Basis or Justification
Correct:	C	MO-25B automatically opens at 450 psig. With RPV pressure at 390 psig, which is above the shut off head (~300 psig) of the RHR pumps, the testable check valve is closed.
Distractors:	A	With RPV pressure at 390 psig, which is above the shut off head (~300 psig) of the RHR pumps, the testable check valve is closed.
	B	MO-25B would automatically open at RPV pressure < 450 psig; AO-2-10-46B would be closed with RPV pressure at 390 psig.
	D	MO-25B would automatically open at RPV pressure < 450 psig.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

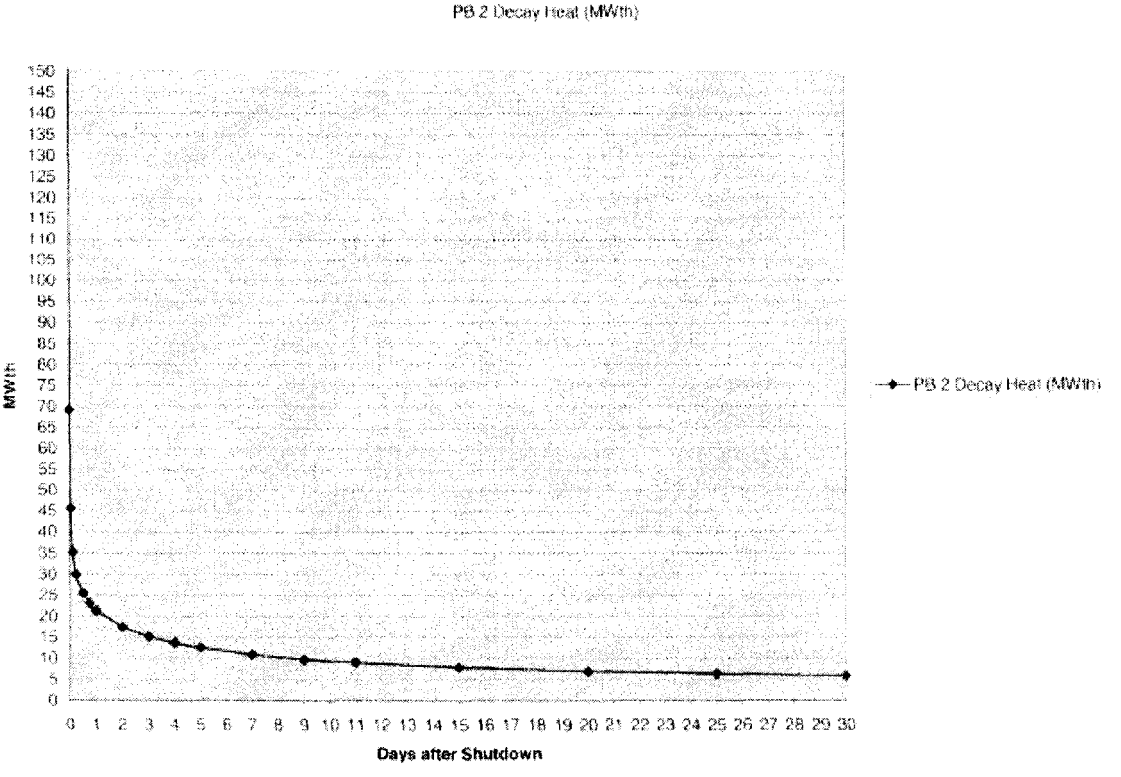
Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	SO 10.7.B-2; T-101 Bases		
Learning Objective:	PLOT-5010-5a		
K/A System	203000 – LPCI Injection	Importance:	RO / SRO 2.7 / 2.9
K/A Statement K5.01 – Knowledge of the operational implications of testable check valve operation as it applies to LPCI Injection.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

2. Unit 2 is in Day 20 of a refueling outage.

   - The Unit is in Mode 5 with fuel moves in progress.
   - Shutdown Cooling was in service using the 2D RHR pump when it tripped on overcurrent.
   - No other RHR pumps will be available to support shutdown cooling for another 72 hours.

   Based on these conditions, which alternate decay heat removal system(s) need to be placed in service to adequately handle the current decay heat load?

   Refer to the portion of ON-125 "Loss or Unavailability of Shutdown Cooling", Attachment 1 "Alternate Decay Heat Removal Systems" on the NEXT PAGE.



   A. RWCU System ONLY

   B. Fuel Pool Cooling System with 2 heat exchangers ONLY

   C. Alternate Shutdown Cooling

   D. RWCU System and Fuel Pool Cooling System with 3 heat exchangers

Attachment 1

ALTERNATE DECAY HEAT REMOVAL SYSTEMS

System	Heat Removal Capability	Limitations
RWCU	4.4 MW (One NRHX)	
Fuel Pool Cooling	1.1 MW (1 HX) 2.2 MW (2 HX) 3.3 MW (3 HX)	1. Unit in MODE 5 2. Reactor cavity flooded 3. Fuel Pool Gates removed
Alternate Shutdown Cooling in accordance with AO 10.12-2(3)	20.5 MW per RHR HX	Will inject low-quality water into RPV

Answer Key		
Question # 2 RO		
Choice		Basis or Justification
Correct:	D	Based on the Decay Heat Curve, Unit 2 has approximately 7 MWth of Decay Heat 20 days after shutdown. To adequately handle removal of that decay heat the RWCU System (4.4 MWth) and the Fuel Pool Cooling System (3.3 MWth w/ all 3 heat exchangers in service) must be placed in service (total of 7.7 MWth decay heat removal capability). Multiple alternate decay heat removal systems may be used together to count as one alternate decay heat removal method.
Distractors:	A	The RWCU System alone has only 4.4 MWth of decay heat removal capability. This is not enough to properly handle the 7 MWth decay heat.
	B	The Fuel Pool Cooling System with only 2 heat exchangers in service has only a total of 2.2 MWth of decay heat removal capability. This is not enough to properly handle the 7 MWth decay heat.
	C	Since no RHR pumps are available for operation, use of AO 10.12-2 is prohibited.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ON-125		
Learning Objective:	PLOT-PBIG-1550-28b		
K/A System	203000 – RHR/LPCI Injection Mode	Importance:	RO / SRO 3.8 / 4.2
K/A Statement G2.4.9 – Knowledge of low power/shutdown implications in accident (e.g. LOCA or loss of RHR) mitigation strategies.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

3. Unit 2 is in a forced outage with the following conditions present:

- The 'A' Loop of SDC is in service using the 2C RHR pump.
- RPV level inadvertently lowers to -3 inches.
- Reactor pressure is 25 psig and stable.

How will the following RHR System components respond to this transient?

- MO-2-10-25A – "A Loop RHR Inboard Discharge Valve"
- MO-2-10-17 and MO-2-10-18 – "RHR shutdown Cooling Suction Valves"
- 2C RHR pump

A. ONLY MO-2-10-25A will close.
2C RHR pump will continue to run.

B. ONLY MO-2-10-17 and MO-2-10-18 will close.
2C RHR pump will trip.

C. MO-2-10-17 and MO-2-10-18 and MO-2-10-25A will remain open.
2C RHR pump will continue to run.

D. MO-2-10-17 and MO-2-10-18 and MO-2-10-25A will close.
2C RHR pump will trip.

Answer Key		
Question # 3 RO		
Choice		Basis or Justification
Correct:	D	MO-17 and 18 will close on the PCIS Group II isolation signal of < +1" RPV level. MO-25A (RHR Injection valve) will also close on PCIS Group II signal of < +1" RPV level with MO-17 open and MO-18 open and RPV pressure < 70 psig. The C RHR pump will trip when either MO-17 or MO-18 indicate not full open (loss of suction path).
Distractors:	A	MO-17 and MO-18 (RHR suction isolation valves) will also close on PCIS Group II isolation signal of < +1" RPV level. The C RHR pump will trip when either MO-17 or MO-18 indicate not full open (loss of suction path).
	B	MO-25A (RHR Injection valve) will also close on PCIS Group II signal of < +1" RPV level with MO-17 open and MO-18 open and RPV pressure < 70 psig.
	C	MO-17 and MO-18 will close on PCIS Group II isolation signal of < +1" RPV level. MO-25A (RHR Injection valve) will also close on PCIS Group II signal of < +1" RPV level with MO-17 open and MO-18 open and RPV pressure < 70 psig. The C RHR pump will trip when either MO-17 or MO-18 indicate not full open.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	GP-8.B COL		
Learning Objective:	PLOT-5010-4o		
K/A System	205000 – Shutdown Cooling	Importance:	RO / SRO 3.2 / 3.2
K/A Statement A3.02 – Ability to monitor automatic operations of the Shutdown Cooling System including pump trips.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

4. The following conditions exist at Unit 2:

   - The HPCI System was manually initiated for level control with the arming collar (23A-S105) left in the "ARMED" position.
   - The HPCI turbine subsequently tripped due to the reactor water level exceeding +46 inches.
   - RPV level stabilized at +52 inches.

   Which one of the following describes HPCI pump/system response to the above conditions?

   A. HPCI will re-initiate if Drywell Pressure exceeds 2 psig.

   B. HPCI will re-initiate if the Manual Initiation pushbutton is depressed again.

   C. HPCI will re-initiate when the High Reactor Level trip signal is reset.

   D. HPCI will ONLY re-initiate when the Lo-Lo Reactor Level setpoint is reached.

Answer Key		
Question # 4 RO		
Choice		Basis or Justification
Correct:	C	The HPCI turbine trips auto reset and DO NOT seal-in. If the trip condition clears AND an initiation signal is present, THEN the HPCI turbine (pump) will cycle on and off as the high RPV level auto resets itself.
Distractors:	A	With the arming collar left in the "ARMED" position the system initiation signal remains present. If drywell pressure reaches 2 psig it will have no additional effect on HPCI.
	B	With the arming collar left in the "ARMED" position the system initiation signal remains present. Pushing the Manual Initiation pushbutton again will have no additional effect on HPCI.
	D	With the arming collar left in the "ARMED" position the system initiation signal remains present. If RPV level were to lower to the Lo-Lo setpoint (-48 inches) it would have no additional effect on HPCI.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	SO 23.7.C-2		
Learning Objective:	PLOT-5023-4c		
K/A System	206000 – HPCI	Importance:	RO / SRO 3.7 / 3.5
K/A Statement A4.10 – Ability to manually operate and/or monitor system pumps in the control room.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

5. An ADS Blowdown has occurred following a LOCA with the following conditions:

- ADS Valve Control Switches remain in AUTO.
- Reactor pressure is 200 psig and lowering slowly.
- All Core Spray and RHR pumps were initially injecting.
- "D" Core Spray pump has since tripped.
- All RHR pumps were secured when level was restored above -100 inches.
- Level is being restored using A, B, and C Core Spray pumps.

An additional Core Spray pump needs to be shutdown to control level recovery.

Which one of the following statements accurately describes the response, if any, of the ADS system to shutting down an additional Core Spray pump?

A. ADS Blowdown will stop if the "A" Core Spray pump is shutdown.

B. ADS Blowdown will stop if the "B" Core Spray pump is shutdown.

C. ADS Blowdown will stop if the "C" Core Spray pump is shutdown.

D. An ADS logic seal-in prevents inadvertent blowdown termination by shutdown of any Core Spray pump.

Answer Key		
Question # 5 RO		
Choice		Basis or Justification
Correct:	C	ADS logic requires "A or B" AND "C or D" Core Spray pumps to initiate and maintain a blowdown. When the C Core Spray pump is shut down, the logic is no longer satisfied and the blowdown will be terminated.
Distractors:	A	ADS logic requires "A or B" AND "C or D" Core Spray pumps to initiate and maintain a blowdown. When the A Core Spray pump is shut down, the logic is still satisfied due to the B AND D Core Spray pumps remaining in operation.
	B	ADS logic requires "A or B" AND "C or D" Core Spray pumps to initiate and maintain a blowdown. When the B Core Spray pump is shut down, the logic is still satisfied due to the A AND D Core Spray pumps remaining in operation.
	D	ADS logic has seal-ins for high drywell pressure and low reactor level, but not for required low pressure injection systems.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	M-1-S-52, ARC 227 E-4		
Learning Objective:	PLOT-5001G-5		
K/A System	209001 – LPCS	Importance:	RO / SRO 3.8 / 3.9
K/A Statement K3.02 – Knowledge of the effect that a loss or malfunction of Low Pressure Core Spray will have on ADS logic.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

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

A. 24 / 48 VDC Distribution

B. The respective pump Motor Control Center

C. 120 VAC Uninterruptible Power Distribution

D. Safety Related 125 VDC Distribution

Answer Key		
Question # 6 RO		
Choice		Basis or Justification
Correct:	B	The MCC of the SLCS pump selected for injection provides the 480VAC power for both squib valves.
Distractors:	A	The MCC of the SLCS pump selected for injection provides the power for both squib valves from Emergency 480 VAC power, not from 24/48 Volt DC distribution.
	C	The MCC of the SLCS pump selected for injection provides the power for both squib valves from Emergency 480 VAC power, not from 120 VAC Uninterruptible Power.
	D	The MCC of the SLCS pump selected for injection provides the power for both squib valves from Emergency 480 VAC power, not from 125 VDC.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ARC 211 H-3; M-1-S-46		
Learning Objective:	PLOT-5011-2b		
K/A System	211000 – Standby Liquid Control System	Importance:	RO / SRO 3.1 / 3.2
K/A Statement K2.02 – Knowledge of the electrical power supplies to the explosive valves.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

7. Per the UFSAR, which one of the following describes the RPS design feature that assures a scram goes to completion once it is initiated?

A. Any automatic scram signal also trips the manual scram logic.

B. Scram reset logic is NOT enabled for 10 seconds following a full scram.

C. Backup Scram valve logic can NOT be reset for at least 40 seconds after a full scram.

D. Mode Switch to Shutdown scram is NOT bypassed for 2 seconds following a full scram.

Answer Key		
Question # 7 RO		
Choice		Basis or Justification
Correct:	B	RPS is designed to ensure that the scram goes to completion once initiated, a scram cannot be reset for at least 10 seconds.
Distractors:	A	The auto scram logic does not trip the manual scram logic
	C	Backup scram valves are not reset until the RPS logic is reset. The 40 second time frame is actually associated with the Alternate Rod Insertion (ARI) logic, not RPS.
	D	Mode switch reset after 2 seconds just allows the scram to be reset with the Mode Switch still in shutdown where it prevents control rod withdrawal.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	M-1-S-54, UFSAR Section 7.2		
Learning Objective:	PLOT-5060F-4g		
K/A System	212000 – Reactor Protection System	Importance:	RO / SRO 4.2 / 4.2
K/A Statement K4.08 – Knowledge of RPS design feature(s) and/or interlocks which provide for complete control rod insertion following scram signal generation.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

8. A reactor startup is in progress on Unit 3.

Power is on Range 2 of the WRNMs when a loss of power to the 'A' WRNM chassis occurs.

Under these conditions, the loss of power will cause _____.

A. ONLY a WRNM Trip/Inop alarm to be generated

B. an RPS full scram signal to be generated

C. an RMCS rod block AND an RPS half scram to be generated

D. the WRNM chassis input to swap to its alternate power supply

Answer Key		
Question # 8 RO		
Choice		Basis or Justification
Correct:	C	Loss of +24 VDC power to any WRNM will generate a rod block to RMCS and an RPS input (1/2 scram signal) if in "Refuel" or "Startup/Hot Standby" Mode. The candidate has to correlate that being on Range 2 of the WRNM relates to being in the "Startup/Hot Standby" Mode and not in the "Run" Mode where the WRNM Trip/Inop would be bypassed.
Distractors:	A	A WRNM Trip/Inop alarm will be generated on a loss of power, however, it is not the only condition. It also generates a rod block to RMCS and is an RPS input (1/2 scram signal only).
	B	Loss of power to any WRNM will generate a rod block to RMCS and is an RPS input (1/2 scram signal only). A full scram is not possible with loss of power to just one WRNM.
	D	WRNM does not have an alternate power supply, like the QLVPS that the APRMs have.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ARC 210 G-3		
Learning Objective:	PLOT-5060C-4a		
K/A System	215003 – IRM	Importance:	RO / SRO 3.6 / 3.6
K/A Statement K1.02 – Knowledge of the physical connections and/or cause-effect relationships between IRM System and Reactor Manual Control.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

9. Which one of the following will result if the recirculation calculated total drive flow signal to APRM '1' fails to zero while at 100% power?

   The APRM will generate a _____.

   A. Half Scram ONLY

   B. Rod Block ONLY

   C. Rod Block AND Half Scram

   D. Full Scram ONLY

Answer Key		
Question # 9 RO		
Choice		Basis or Justification
Correct:	B	'1' APRM Hi-Hi trip would cause trip input to voters and Hi alarm would cause block 0.65W + 54%.
Distractors:	A	One APRM cannot cause 1/2 scrams due to 2/4 voter (trip logic) operation.
	C	One APRM cannot cause 1/2 scrams due to 2/4 voter (trip logic) operation.
	D	Requires any 2 APRM trips to initiate full scram.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ARC 211 D-3; SO 62.7.A-2		
Learning Objective:	PLOT-5060-6f		
K/A System	215005 – APRM/LPRM	Importance:	RO / SRO 3.2 / 3.3
K/A Statement K6.07 – Knowledge of the effect that a loss or malfunction of the flow converter / comparator network will have on the APRM/LPRM System.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

10. Both RCIC and HPCI initiated on Unit 3 low-low RPV water level. Current plant conditions are as follows:

- Reactor water level is +18 inches and stable
- Reactor pressure is 1040 psig and rising slowly
- Drywell pressure is 0.8 psig and stable
- RCIC is in the CST to CST mode at 600 gpm with the flow controller in AUTO
- HPCI is injecting to the reactor at 1000 gpm with the flow controller in AUTO
- The PRO reports Torus level is 15' 8" and rising slowly

Based on the above conditions, which statement below describes (1) RCIC system response, if any, and (2) the appropriate procedure to respond to the condition?

A. (1) RCIC will trip on low suction pressure.
(2) Perform SO 13.7.A-3 "Recovery From RCIC System Isolation or Turbine Trip".

B. (1) RCIC speed will rise until the overspeed trip occurs.
(2) Perform SO 13.7.A-3 "Recovery From RCIC System Isolation or Turbine Trip".

C. (1) RCIC will remain in the CST to CST mode of operation.
(2) Continue to operate the system using RRC 13.1-3 "RCIC System Operation During A Plant Event".

D. (1) RCIC Torus suction valves (MO-3-13-039 and MO-3-13-041) will auto open.
(2) Continue to operate the system using RRC 13.1-3 "RCIC System Operation During A Plant Event".

Answer Key		
Question # 10 RO		
Choice		Basis or Justification
Correct:	B	On high Torus level > 15' 6" HPCI suction from CST closes and Torus suction valves open. This swap also causes MO-24 return to CST to auto close thereby removing the RCIC system flow path back to CST. RCIC flow controller will attempt to maintain flow at 600 gpm and increase turbine speed until it trips at 125% of rated speed.
Distractors:	A	RCIC suction pressure will not be affected by MO-24 closure. No suction valves will reposition.
	C	RCIC will not remain in CST-to-CST mode. System will trip on mechanical overspeed as flow controller will increase speed to maintain system flow as MO-24 closes.
	D	RCIC Torus suction valves do not have an auto open function. Realigning RCIC suction to Torus must be done manually.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ARC 221 C-4		
Learning Objective:	PLOT-5013-1c		
K/A System	217000 – RCIC	Importance:	RO / SRO 3.4 / 3.3
K/A Statement A2.03 – Ability to (a) predict the impacts of valve closures on RCIC and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

11. Unit 2 is at 100% power when the following occur:

- Annunciator 227 C-5 BLOWDOWN VALVES POWER MONITOR alarms.
- The GREEN indicating light for the 'A' SRV is NOT lit.
- The GREEN indicating lights for ALL other SRVs are lit.

Investigation identifies blown fuses associated with the 'A' SRV solenoid.

Based on these conditions, the 'A' SRV ___(1)___ open on automatic ADS initiation, and ___(2)___ open on manual SRV operation.

A. (1) will
(2) will

B. (1) will
(2) will NOT

C. (1) will NOT
(2) will

D. (1) will NOT
(2) will NOT

Answer Key		
Question # 11 RO		
Choice		Basis or Justification
Correct:	D	The given conditions indicate a loss of 125 VDC to the 'A' ADS SRV solenoid. In order for this to occur, both the normal and alternate power supplies to the SRV solenoid must be unavailable. This being the case both ADS actuation as well as manual operation of the 'A' SRV is defeated.
Distractors:	A	Both ADS and manual operation of the 'A' SRV are defeated.
	B	Both ADS and manual operation of the 'A' SRV are defeated.
	C	Both ADS and manual operation of the 'A' SRV are defeated.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	M-1-S-52, Sheet 3		
Learning Objective:	PLOT-5001G-6e		
K/A System	218000 – ADS	Importance:	RO / SRO 3.7 / 3.6
K/A Statement A3.07 – Ability to monitor automatic operations of the ADS including lights and alarms.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

12. A Group 1 PCIS isolation is being reset on Unit 2 using procedure GP-8A "PCIS Isolation – Group 1".

- All Group1 isolation signals are cleared.
- All Group 1 valve control switches are in the target position required for logic reset.
- Inboard PCIS Reset Switch 16A-S32 is HELD in the "GRP I" position.

What is the status of the following PCIS reset circuit relays for these conditions?

Refer to the portions of electrical schematic drawing M-1-S-23 Sheet 9 on the NEXT TWO PAGES.

Relay 16A-K9 is ____(1)____ and relay 16A-K11 is ____(2)____.

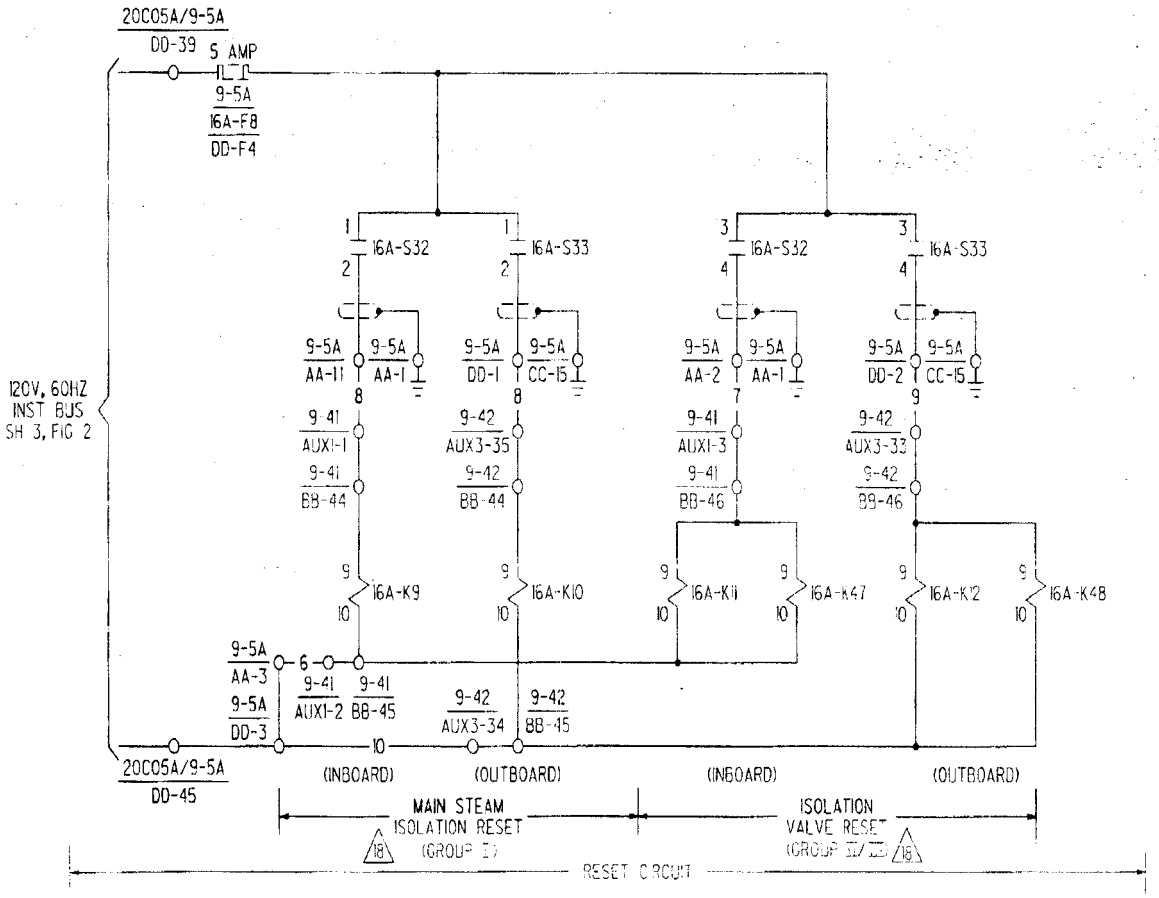
A. (1) energized
(2) energized

B. (1) de-energized
(2) energized

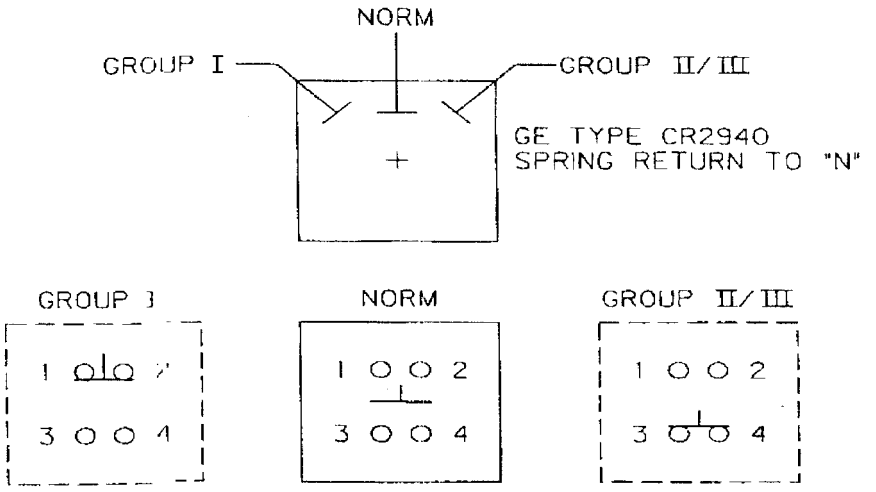
C. (1) energized
(2) de-energized

D. (1) de-energized
(2) de-energized

M-1-S-23 Sheet 9



M-1-S-23 Sheet 9



SWITCH DESIG	CONT	SHEET NO
16A-S32 16A-S33	1-2	9
	3-4	9
	5-6	—
	7-8	—

Answer Key		
Question # 12 RO		
Choice		Basis or Justification
Correct:	C	Placing Inboard PCIS Reset Switch 16A-S32 in the "GRP I" position will close contacts 1-2 and complete the circuit to energize 16A-K9. Relay 16A-K11 does not get energized until switch 16A-S32 is placed in the "GRP II/III" position.
Distractors:	A	Relay 16A-K11 does not get energized until switch 16A-S32 is placed in the "GRP II/III" position.
	B	Placing Inboard PCIS Reset Switch 16A-S32 in the "GRP I" position will close contacts 1-2 and complete the circuit to energize 16A-K9. Relay 16A-K11 does not get energized until switch 16A-S32 is placed in the "GRP II/III" position.
	D	Placing Inboard PCIS Reset Switch 16A-S32 in the "GRP I" position will close contacts 1-2 and complete the circuit to energize 16A-K9.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	M-1-S-23, Sheet 9; GP-8.A		
Learning Objective:	PLOT-5007G-5a		
K/A System	223002 – PCIS	Importance:	RO / SRO 2.6 / 2.8
K/A Statement A1.04 – Ability to predict and/or monitor changes in parameters associated with operating the Primary Containment Isolation System controls including individual system relay status.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

13. Unit 2 drywell pressure is 3 psig.

- Annunciator 214 D-1 Group II / III INBOARD ISOL RELAYS NOT RESET is in alarm
- Annunciator 214 E-1 Group II / III OUTBOARD ISOL RELAYS NOT RESET is in alarm
- NO other PCIS signals have been generated

Which one of the following components has FAILED to respond to these conditions?

A. 'B' SBGT Fan – red light ON, green light OFF

B. RWCU Outlet Isolation Valve (MO-68) – red light ON, green light OFF

C. DW Instrument N2 Supply Valve (AO-2969A) – red light ON, green light OFF

D. SBGTS 'A' Filter Train Inlet Valve (AO-00475-1) – red light ON, green light OFF

Answer Key		
Question # 13 RO		
Choice		Basis or Justification
Correct:	C	This is an incorrect response. Red light LIT and green light OFF indicate the valve is open. AO-2969A should close on a GRP II signal.
Distractors:	A	This is a correct response. Red light LIT and green light OFF indicate the fan is running. B SBGT fan (also A SBGT fan) will start and both filter trains should align in response to the GRP III signal.
	B	This is a correct response. Red light LIT and green light OFF indicate the valve is open. RWCU does not isolate on high DW pressure.
	D	This is a correct response. Red light LIT and green light OFF indicate the valve is open. SBGTS 'A' Filter Train Inlet and Outlet Valves should be open on auto initiation of SBGT.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	GP 8.B		
Learning Objective:	PLOT-5007G-3x		
K/A System	223002 – PCIS	Importance:	RO / SRO 3.4 / 3.4
K/A Statement A3.01 – Ability to monitor automatic operations of PCIS including system indicating lights and alarms.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

14. Unit 2 was initially at 100% power.

- A complete loss of Instrument Air occurred.
- Instrument Air header pressure is 0 psig.
- NO operator actions have been taken.

Which one of the following correctly describes the pneumatic supply to the Safety Relief Valves (SRVs) for these conditions?

A. The CAD tank is supplying nitrogen to the SRVs.

B. ADS accumulators are the only pneumatic supply available to the SRVs.

C. The Instrument Nitrogen system is supplying the SRVs via the Instrument Nitrogen header.

D. The Backup Instrument Nitrogen to ADS System is supplying the SRVs.

Answer Key		
Question # 14 RO		
Choice		Basis or Justification
Correct:	B	With no instrument air, the AO-2969 valves fail closed, which means no pneumatic supply to SRVs except ADS accumulators.
Distractors:	A	The CAD tank supply has to be manually valved in. The question stem specifically states there have been NO operator actions taken.
	C	With no instrument air, the AO-2969 valves fail closed, which means no pneumatic supply to SRVs via the Instrument Nitrogen header.
	D	The Backup Instrument Nitrogen to ADS System must be manually valved in-service from the main control room. The question stem specifically states there have been NO operator actions taken.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ON-119; SE-11 Bases, Step B-4		
Learning Objective:	PLOT-5036-3a		
K/A System	239002 – SRVs	Importance:	RO / SRO 3.1 / 3.3
K/A Statement K1.05 – Knowledge of the physical connections and/or cause-effect relationship between SRVs and plant air systems.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

15. Unit 2 reactor startup is in progress.

- RPV pressure is 450 psig with 3 bypass valves open.
- The 2C RFPT is being placed in service using SO 6C.1.A-2 "C Reactor Feedwater Pump Startup With Vessel Level Control Established Through AO-8091".
- MSC SELECT is lit for the 2C RFPT on Panel 20C005A.
- 2C RFPT is on turning gear.

In accordance with procedure SO 6C.1.A-2, pressing and releasing the RFPT "AUTO START" pushbutton at this time will raise RFPT speed to the_____(1)_____ and _____(2)_____be aborted by pushing any speed "LOWER" or "RAISE" pushbutton.

A. (1) minimum governor control speed of approximately 400 to 600 rpm
(2) cannot

B. (1) Low Speed Stop setting of approximately 2600 to 2900 rpm
(2) can

C. (1) minimum governor control speed of approximately 400 to 600 rpm
(2) can

D. (1) Low Speed Stop setting of approximately 2600 to 2900 rpm
(2) cannot

Answer Key		
Question # 15 RO		
Choice		Basis or Justification
Correct:	B	When the "AUTO START" pushbutton is depressed then the RFPT will ramp to the Low Speed Stop (LSS) setting of 2600 to 2900 rpm. The auto start can be aborted by pushing any speed LOWER or RAISE pushbutton and the turbine speed will be controlled at the speed the turbine is at when the button was pushed.
Distractors:	A	Speed range is not correct for pushing the "AUTO START" pushbutton. Minimum governor control speed is correct for depressing the "SLOW" or "FAST RAISE" pushbuttons.
	C	Speed range is not correct for pushing the "AUTO START" pushbutton. Minimum governor control speed is correct for depressing the "SLOW" or "FAST RAISE" pushbuttons.
	D	The auto start can be aborted by pushing any speed LOWER or RAISE pushbutton and the turbine speed will be controlled at the speed the turbine is at when the button was pushed.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	SO 6C.1.A-2		
Learning Objective:	PLOT-5006-4a		
K/A System	259002 – Reactor Water Level Control	Importance:	RO / SRO 3.8 / 3.6
K/A Statement A4.01 – Ability to manually operate and/or monitor in the control room: All individual component controllers in the manual mode.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

16. A transient resulted in RPV level lowering to -50 inches on Unit 3.

What is the status of the Standby Gas Treatment (SBGT) System for this condition?

A. SBGT fans B and C initiated, with ONLY filter train B aligned for flow.

B. SBGT fans A, B, and C initiated, with filter trains A and B aligned for flow.

C. ONLY SBGT fans A and C initiated, with filter trains A and B aligned for flow.

D. ONLY SBGT fans B and C initiated, with filter trains A and B aligned for flow.

Answer Key		
Question # 16 RO		
Choice		Basis or Justification
Correct:	D	For Unit 3, the B&C SBGT fans will auto start and the 'A' and 'B' filter trains will align for service on RPV level < 1".
Distractors:	A	The 'A' SBGT filter train will also align for system flow. 'A' and 'B' filter train align for service with an initiation from either unit.
	B	The 'A' SBGT fan will not auto start in response to a Unit 3 event, only Unit 2.
	C	The 'A' SBGT fan will not auto start in response to a Unit 3 event, only Unit 2.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	SO 9A.1.C		
Learning Objective:	PLOT-5009A-4a		
K/A System	261000 – SGTS	Importance:	RO / SRO 3.7 / 3.8
K/A Statement K4.01 – Knowledge of SBGT design feature(s) and/or interlocks which provide for automatic system initiation.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

17. A loss of all off-site power (LOOP) occurred.

- Unit 2 and Unit 3 were manually scrammed.
- Unit 2 RPV water level is -35 inches and rising slowly.
- Unit 3 RPV water level is -20 inches and rising slowly.
- Emergency Diesel Generator output breaker E-12 failed to close.

Based on the above conditions, which one of the following identifies the status of the SBGT fans?

A. 'A' fan is running
'B' fan is running
'C' fan is running

B. 'A' fan is running
'B' fan is off
'C' fan is running

C. 'A' fan is off
'B' fan is running
'C' fan is off

D. 'A' fan is off
'B' fan is running
'C' fan is running

Answer Key		
Question # 17 RO		
Choice		Basis or Justification
Correct:	D	All three fans started on <1 inch low RPV level condition. The 'A' SBGT fan is powered by the E-1 EDG from the E-12 4kV bus through E-124-T-B and would be off sine E-12 bus is de-energized. The 'B' SBGT fan is powered by the E-2 EDG from E-22 bus through E-224-T-B and would be unaffected. The 'C' SBGT fan is powered by the E-3 EDG from E-33 bus through E-334-R-B and would be unaffected.
Distractors:	A	The 'A' SBGT fan would NOT be running since it is powered from E-12 bus through load center E-124-T-B and the E-12 bus is de-energized.
	B	The 'A' SBGT fan would NOT be running since it is powered from E-12 bus through load center E-124-T-B and the E-12 bus is de-energized. 'B' and 'C' fans would be running since they are powered from E-22 and E-33 busses respectively.
	C	'C' fan would be running since it is powered from E-33 bus.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	SO 9A.1.A COL; SO 9A.1.C		
Learning Objective:	PLOT-5009A-2b		
K/A System	261000 – Standby Gas Treatment System	Importance:	RO / SRO 3.0 / 3.1
K/A Statement K6.03 – Knowledge of the effect that a loss or malfunction of the Emergency Diesel Generator System will have on the Standby Gas treatment System.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

18. Unit 2 is operating at 100% power.

- The PRO manually taps down the 2 Startup Transformer 00X003 by placing the Load Tap Changer (LTC) control switch to "LOWER".
- After releasing the LTC control switch the LTC continues to LOWER for another 15 seconds before stopping.
- The voltage on the normal offsite feeder for the E-12 bus degrades to 89% of rated voltage and remains steady at that value.
- The PRO checks the status of the E-12 Bus after 2 minutes have elapsed.

In accordance with ARC 001 D-1 "E12 Bus Undervoltage", the PRO would find the E-12 Bus energized from the ___(1)___ and the crew will need to reset an ___(2)___ isolation.

A. (1) alternate offsite feed
(2) Outboard Group II

B. (1) E-1 Diesel Generator
(2) Outboard Group II

C. (1) alternate offsite feed
(2) Inboard Group II

D. (1) E-1 Diesel Generator
(2) Inboard Group II

Answer Key		
Question # 18 RO		
Choice		Basis or Justification
Correct:	C	The off-site feeder breaker (E-212 or E-312) will trip if supply voltage degrades to < 99.8% for nominally 61 seconds with NO LOCA signal present. The E-12 bus will be supplied via the alternate feeder breaker (fast transfer will occur). The E-124 load center supply breaker opens on the load shed and results in a loss of 20Y033 panel and a subsequent Inboard Group II isolation due to the power loss of PCIS relays.
Distractors:	A	While the E-12 bus transfers to its alternate feed, an outboard Group II isolation does not occur.
	B	E-12 transfers after 61 seconds (127E relay); E-1 D/G does not start. Also, an outboard Group II isolation does not occur.
	D	E-12 transfers after 61 seconds (127E relay).

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ARC-001 D-1; SO 54.7.A		
Learning Objective:	PLOT-5054-6b		
K/A System	262001 – AC Electrical Distribution	Importance:	RO / SRO 2.9 / 3.1
K/A Statement A1.03 – Ability to predict and/or monitor changes in bus voltage associated with operating the A.C. Electrical Distribution controls.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

19. Both Units are at 100% power.

- The 4KV System is in a normal line-up, except for the E-312 breaker, which is racked out for elevator mechanism preventative maintenance.
- The PRO inadvertently opens the E-212 breaker, de-energizing the E-12 bus.

Based on these conditions, the E-1 EDG ___(1)___ automatically start. Entry into Technical Specifications is _____(2)_____.

A. (1) will
(2) required

B. (1) will
(2) NOT required

C. (1) will NOT
(2) required

D. (1) will NOT
(2) NOT required

Answer Key		
Question # 19 RO		
Choice		Basis or Justification
Correct:	C	The E-212 and the E-312 breakers are the normal and alternate feeder breakers for the E-12 bus. With E-312 breaker racked out and E-212 breaker taken to OPEN (both breakers "green-flagged"), EDG auto-start is defeated. Tech Spec (3.8.7) entry is required since the E-12 4kV bus is considered inoperable when deenergized.
Distractors:	A	The E-212 and the E-312 breakers are the normal and alternate feeder breakers for the E-12 bus. With E-312 breaker racked out and E-212 breaker taken to OPEN (both breakers "green-flagged"), EDG auto-start is defeated.
	B	The E-212 and the E-312 breakers are the normal and alternate feeder breakers for the E-12 bus. With E-312 breaker racked out and E-212 breaker taken to OPEN (both breakers "green-flagged"), EDG auto-start is defeated. Tech Spec (3.8.7) entry is required since the E-12 4kV bus is considered inoperable when deenergized.
	D	Tech Spec (3.8.7) entry is required since the E-12 4kV bus is considered inoperable when deenergized.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	PLOT-5054, SO 52A.1.B; Tech Spec 3.8.7		
Learning Objective:	PLOT-5054-04b		
K/A System	262001 – A.C. Electrical Distribution	Importance:	RO / SRO 3.1 / 4.2
K/A Statement G2.2.36 – Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

20. The following conditions are present on Unit 2:

- The 20Y050 panel was aligned to the bypass (alternate) source using the Static Switch "Load to Bypass" pushbutton.
- Subsequently, the alternate supply breaker on E-124-R-C is inadvertently opened.

For these conditions, the Static Switch ____(1)____ automatically transfer the 20Y050 panel back to the Static Inverter output and 20Y050 panel power will be _____(2)_____.

A. (1) will
(2) temporarily interrupted due to Static Switch operation

B. (1) will
(2) maintained during Static Switch operation

C. (1) will NOT
(2) lost until the Static Switch "Load to Inverter" pushbutton is operated

D. (1) will NOT
(2) lost until the Manual Bypass/Isolation Switch (MB/IS) is placed in the "BYPASS" position

Answer Key		
Question # 20 RO		
Choice		Basis or Justification
Correct:	C	IF manually transferred it will not automatically transfer back.
Distractors:	A	Static Switch only auto transfers to the Inverter if it first "auto" transferred to the alternate.
	B	Static Switch only auto transfers to the inverter if it first "auto" transferred to the alternate.
	D	This will transfer to alternate which is de-energized.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ARC 220 F-5; PLOT-5058		
Learning Objective:	PLOT-5058-5c		
K/A System	262002 – UPS (AC/DC)	Importance:	RO / SRO 2.7 / 2.9
K/A Statement K6.01 – Knowledge of the effect that a loss or malfunction of AC electrical power will have on the UPS (AC/DC).			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

21. Unit 3 was at 100% power when the following conditions occur:

- 220 F-5 "Inverter Trouble" alarms
- 210 C-1 "SDV Hi Water Level Trip" alarms
- 211 B-1 "A Channel Reactor Auto Scram" alarms
- 211 C-1 "B Channel Reactor Auto Scram" alarms
- A loss of Control Rod Position Indication on the Full Core Display

Based on the above conditions, reactor power is monitored from ___(1)___ and if it's less than 4%, procedure ___(2)___ is entered.

A. (1) 20C05 WRNM Operator Displays
(2) T-101 "RPV Control"

B. (1) 20C05 APRM Operator Displays
(2) T-100 "Scram"

C. (1) Safety Parameter Display System (SPDS)
(2) T-101"RPV Control"

D. (1) 20C036 WRNM Chassis
(2) T-100 "Scram"

Answer Key		
Question # 21 RO		
Choice		Basis or Justification
Correct:	D	With a loss of uninterruptible power, the WRNM indicators on the back panel (20C036) are operable. With power less than 4%, T-100 is entered
Distractors:	A	20C05 operator displays fails as is. If power is less than 4%, even with an ATWS, T-100 entered, not T-101.
	B	20C05 APRM Operator Displays fail as is on a loss of uninterruptible power.
	C	SPDS is not allowed to be used to determine reactor power for decision making out of the TRIP procedures. T-101 is the wrong TRIP to enter if power was less than 4%.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	T-100; ON-112-3; ARC 220 F-5		
Learning Objective:	PLOT-1560-11		
K/A System	262002 – UPS (AC/DC)	Importance:	RO / SRO 2.6 / 2.8
K/A Statement A2.01 – Ability to (a) predict the impact of undervoltage on the Uninterruptible Power Supply (AC/DC); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

22. An electrical fault has resulted in the loss of the Unit 3 Div. I Station 125 VDC distribution panel 30D23 (3PPC).

A few minutes later, a LOCA signal provides an automatic start signal to the Emergency Diesel Generators.

Which one of the following is the diesel response resulting from the loss of DC power?

A. E-1 diesel will NOT start automatically.

B. E-1 diesel will start but NOT field flash.

C. E-3 diesel will NOT start automatically.

D. E-3 diesel will start but NOT field flash.

Answer Key		
Question # 22 RO		
Choice		Basis or Justification
Correct:	C	Div I 125 VDC Panel 3PPC supplies the E-3 EDG 125VDC logic and solenoid power. E-3 will not start.
Distractors:	A	The E-1 EDG will auto start. E-1 control power is from 20D21 panel and not the 30D23 panel.
	B	The E-1 EDG will auto start and be able to flash its field as designed. E-1 control power is from 20D21 panel and not the 30D23 panel.
	D	E-3 EDG cannot start since it has lost all control power.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	E-27, Sheet 1, E-26 Sheet 2, PLOT-5052		
Learning Objective:	PLOT-5052-2c		
K/A System	263000 – D.C. Electrical Distribution	Importance:	RO / SRO 3.4 / 3.8
K/A Statement K3.01 – Knowledge of the effect that a loss or malfunction of the D.C. Electrical Distribution will have on Emergency Generators.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

23. Given the following:

- Unit 2 was at full power when a loss of all off-site power occurred.
- Diesel Generator E-1 failed to start.
- RPV level is -10 inches and steady.
- Reactor pressure is 950 psig.
- CRD ACCUMULATOR LO PRESS/HI LEVEL (211 E-2) is in alarm.
- 2A DC POWER PANEL LO VOLTAGE (209 C-3) is in alarm.
- 2A DC Bus voltage at Panel 20C021 (CSR) is 90 VDC.

Which one of the following actions is required to be performed for these conditions?

A. Determine plant impact of low DC Bus voltage in accordance with SE-13 "Loss of a 125 or 250 VDC Safety Related Bus".

B. Restart the 2A CRD Pump in accordance with SO 3.1.-2 "CRD Hydraulic System Startup with the System Filled and Vented".

C. Place the alternate 2A battery charger in service in accordance with SO 57B.1-2 "125/250 Volt Station Battery Charger Operations".

D. Transfer the 2A battery charger power source from E-124-T-B to E-134-T-B in accordance with AO 57B.6-2 "Transfer of 125V Battery Charger 2AD003 to Alternate Power and Return to Normal".

Answer Key		
Question # 23 RO		
Choice		Basis or Justification
Correct:	A	This is an SE-13 entry condition...the referenced alarm and voltage on a safety-related 125 VDC distribution panel less than 107.45 VDC requires entry into SE-13.
Distractors:	B	Cannot start the 2A CRD Pump due to no power available to the E-12 bus.
	C	Both the normal and alternate supply to the battery charger comes from the same source, which is E-12 bus.
	D	This evolution can only be done when in MODE 4 or 5, as specified in AO 57B.6-2, Prerequisite 2.1.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ARC 209 C-3; SE-13; AO 57B.6-2		
Learning Objective:	PLOT-1555-1		
K/A System	263000 – D.C. Electrical Distribution	Importance:	RO / SRO 4.3 / 4.4
K/A Statement G1.2.23 – Ability to perform specific system and integrated plant procedure during all modes of operation.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

24. The E-4 Diesel Generator is paralleled to the 2 Emergency Auxiliary Transformer (0AX004) and Bus E42 and loaded as follows:

- 1000 kW
- 200 KVARS

Assuming the load on the system was constant, how would real load and reactive load be expected to respond if the E-4 Diesel Generator Voltage Control switch was momentarily placed in the 'RAISE' position?

	Real Load (KW)	Reactive Load (KVARS)
A.	Raise	Remain approximately the same
B.	Lower	Raise
C.	Remain approximately the same	Raise
D.	Remain approximately the same	Lower

Answer Key		
Question # 24 RO		
Choice		Basis or Justification
Correct:	C	With a constant grid load, real load would remain constant. Increasing the excitation of the generator would cause its reactive load to increase. Frequency will not be affected by changes in generator excitation.
Distractors:	A	With a constant grid load, real load would remain constant. Increasing the excitation of the generator would cause its reactive load to increase.
	B	With a constant grid load, real load would remain constant.
	D	Increasing the excitation of the generator would cause its reactive load to increase.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	SO 52A.1.B, Section 4.2		
Learning Objective:	PLOT-5052-5b		
K/A System	264000 – EDGs	Importance:	RO / SRO 3.4 / 3.4
K/A Statement K5.05 – Knowledge of the operational implications of paralleling A.C. power sources as they apply to the Emergency Diesel Generators.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

25. Unit 2 is experiencing a loss of Instrument Air transient.

Per procedure ON-119 "Loss of Instrument Air", as Instrument Air pressure LOWERS from its normal value, the MAXIMUM pressure when the Backup Instrument Air Compressor 2DK001 will automatically start is ___(1)___ and the MAXIMUM pressure when the Backup Air Control Valve (AO-80250D) will automatically open is ___(2)___.

A. (1) 90 psig
(2) 90 psig

B. (1) 90 psig
(2) 100 psig

C. (1) 100 psig
(2) 90 psig

D. (1) 100 psig
(2) 100 psig

Answer Key		
Question # 25 RO		
Choice		Basis or Justification
Correct:	C	The Backup Instrument Air Compressor 2DK001 will automatically start when both the 'A' and 'B' Instrument Air receiver pressures drop to 100 psig. AO-80250D will open when both the 'A' and 'B' Instrument Air receiver pressures drop to 90 psig.
Distractors:	A	The Backup Instrument Air Compressor 2DK001 will automatically start at Instrument Air Receiver pressure of 100 psig, not 90 psig.
	B	The Backup Instrument Air Compressor 2DK001 will automatically start when both the 'A' and 'B' Instrument Air receiver pressures drop to 100 psig. AO-80250D will open when both the 'A' and 'B' Instrument Air receiver pressures drop to 90 psig.
	D	AO-80250D will open when both the 'A' and 'B' Instrument Air receiver pressures drop to 90 psig as sensed by PS-2481 A and B.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ON-119		
Learning Objective:	PLOT-5036-4a		
K/A System	300000 – Instrument Air	Importance:	RO / SRO 2.8 / 2.9
K/A Statement K4.01 – Knowledge of Instrument Air System design feature(s) and /or interlocks which provide for the manual/automatic transfers of control.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

26. Unit 3 is operating at 100% power. The Drywell Chilled Water (DWCW) System is aligned as follows:

- 3A and 3B Drywell Chillers in service
- 3B and 3C DWCW Pumps running
- 3C Drywell Chiller in STBY
- 3A DWCW Pump in STBY

The #4 Auxiliary Bus becomes de-energized and can NOT be restored.

Assuming no operator action, which one of the follow describes the response of the DWCW System?

The 3A Drywell Chiller will remain running and ____(1)____ continue supplying DWCW loads.
Emergency powered swap-over valves ____(2)____ reposition to allow RBCCW to supply DWCW loads.

A. (1) will
(2) will NOT

B. (1) will NOT
(1) will NOT

C. (1) will
(2) will

D. (1) will NOT
(2) will

Answer Key		
Question # 26 RO		
Choice		Basis or Justification
Correct:	D	The 3B and the 3C Drywell Chiller Units are powered by the #4 Aux. Bus. On a loss of the #4 Aux. Bus both of these coolers are unavailable AND emergency powered motor-operated transfer valves and air-operated blocking valves will reposition allowing the RBCCW System to provide automatic back up cooling water flow to the DWCW System in the event of a loss of power to 2 of the 3 chiller units. Loss of power is sensed by an undervoltage device located in the 480V Load Center, upstream of the chiller breakers.
Distractors:	A	3C Drywell Chiller will be unavailable as it is powered from #4 Aux Bus. Emergency powered motor-operated transfer valves and air-operated blocking valves will reposition allowing the RBCCW System to provide automatic back up cooling water flow.
	B	3A Chiller will be running, however, RBCCW will be supplying loads. Emergency powered motor-operated transfer valves and air-operated blocking valves will open allowing the RBCCW System to provide automatic back up cooling water flow to the DWCW System.
	C	In the event of a loss of power to 2 of the 3 chiller units (3B and the 3C Drywell Chiller Units) emergency powered motor-operated transfer valves and air-operated blocking valves will reposition, preventing the remaining 3A Drywell Chiller from supplying DWCW loads.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	AO 44A.1-3		
Learning Objective:	PLOT-5044-2b		
K/A System	400000 – Component Cooling Water	Importance:	RO / SRO 2.9 / 2.9
K/A Statement K2.02 – Knowledge of electrical power supplies to CCW valves.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

27. Alternate Rod Insertion (ARI) solenoids are powered from ____(1)____ and ____(2)____ to actuate.

A. (1) 125 VDC
(2) de-energize

B. (1) 125 VDC
(2) energize

C. (1) RPS
(2) de-energize

D. (1) RPS
(2) energize

Answer Key		
Question # 27 RO		
Choice		Basis or Justification
Correct:	B	ARI valves are powered from DIV I/II 125 VDC and energize to actuate from manual pushbuttons or upon auto initiation signal of either -48" or 1106 psig RPV pressure.
Distractors:	A	ARI valves energize to actuate from manual pushbuttons or upon auto initiation signal of either -48" or 1106 psig RPV pressure.
	C	ARI valves are powered from DIV I/II 125 VDC, NOT RPS, and energize upon initiation signal of either -48" or 1106 psig RPV pressure. +1" is the RPV level associated with RPS scram and PCIS Group II/III isolations.
	D	ARI valves are powered from DIV I/II 125 VDC, NOT RPS, and energize upon initiation signal of either -48" or 1106 psig RPV pressure.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	E-3030, Sheet 1		
Learning Objective:	PLOT-5003A-5h		
K/A System	201001 – CRD Hydraulics	Importance:	RO / SRO 4.5 / 4.5
K/A Statement K2.05 – Knowledge of electrical power supplies to the Alternate Rod Insertion (ARI) valve solenoids.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

28. The Control Rod Select Power Switch supplies power to the ____(1)____. It is the only method of ____(2)____.

A. (1) Rod Select Matrix
(2) manually deselecting all control rods

B. (1) Rod Select Matrix
(2) resetting a control rod drift alarm

C. (1) Four Rod Display
(2) resetting a control rod drift alarm

D. (1) Four Rod Display
(2) manually deselecting all control rods

Answer Key		
Question # 28 RO		
Choice		Basis or Justification
Correct:	A	The rod select power switch supplies power to the control rod select matrix AND is the ONLY method of manually de-selecting all control rods.
Distractors:	B	Resetting a control rod drift alarm is the function of the rod drift alarm test switch, not the rod select power switch.
	C	The four rod display is not powered by the control rod select power. Resetting a control rod drift alarm is the function of the rod drift alarm test switch, not the rod select power switch.
	D	The four rod display is not powered by the control rod select power.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	SO 62.1.A-2		
Learning Objective:	PLOT-5062-5		
K/A System	201002 – RMCS	Importance:	RO / SRO 2.8 / 2.8
K/A Statement A4.06 – Ability to manually operate and/or monitor the rod select matrix power switch in the main control room.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

29. Unit 2 reactor startup is in progress:

- RPV pressure is 150 psig.
- Control rod 30-31 is at target position 12.
- The accumulator for HCU 30-31 developed a water-side leak.
- An Equipment Operator immediately closed HV-2-3A-13113 "Charging Water Riser Isolation Valve" for HCU 30-31 to isolate the leak.
- HCU 30-31 accumulator pressure lowers to 100 psig as read on PI-13-131.

One minute after HV-2-3A-13113 was closed, a reactor scram occurred.

Control Rod 30-31 ____(1)____ scram because ____(2)____.

Refer to the portion of P&ID M-357 Sheet 1 "Control Rod Drive Hydraulic System" on the NEXT PAGE.

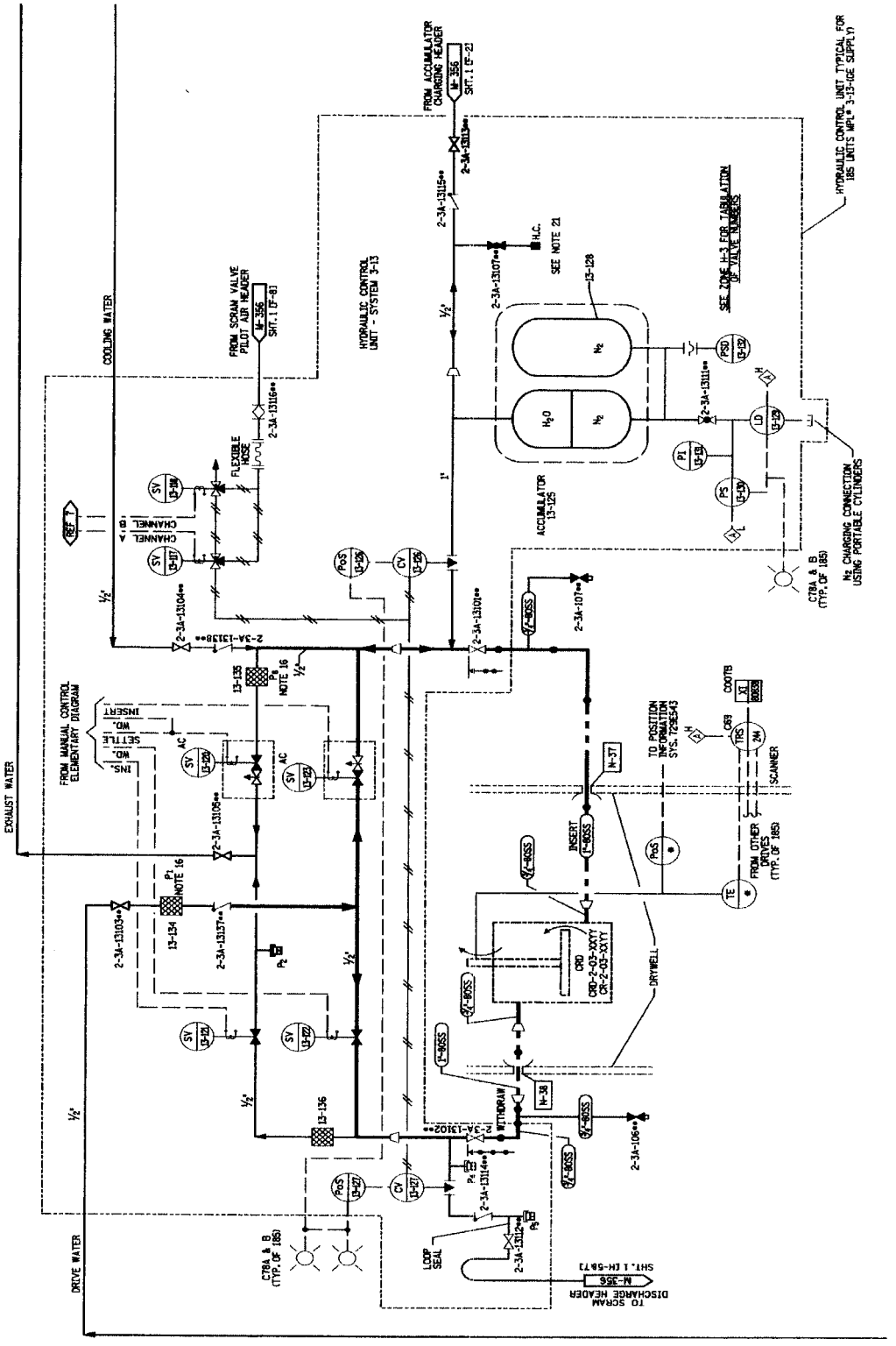
A. (1) will
(2) reactor pressure is high enough ONLY

B. (1) will
(2) reactor pressure and accumulator pressure together are high enough

C. (1) will NOT
(2) reactor pressure and accumulator pressure are too low

D. (1) will NOT
(2) accumulator pressure ONLY is too low

P&ID M-357 Sheet 1



Answer Key		
Question # 29 RO		
Choice		Basis or Justification
Correct:	C	Reactor pressure is only 150 psig and accumulator pressure is only 100 psig. The control rod will not scram with pressure below 400 psig due to the net initial upward force to scram the drive being zero.
Distractors:	A	Reactor pressure is only 150 psig and accumulator pressure is only 100 psig. The control rod will not scram with pressure below 400 psig due to the net initial upward force to scram the drive being zero.
	B	Reactor pressure is only 150 psig and accumulator pressure is only 100 psig. The control rod will not scram with pressure below 400 psig due to the net initial upward force to scram the drive being zero.
	D	Both reactor pressure and accumulator pressure are too low in pressure. The control rod will not scram with pressure below 400 psig due to the net initial upward force to scram the drive being zero.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	M-357; UFSAR, PLOT-5003A		
Learning Objective:	PLOT-5003A-5		
K/A System	201003 – Control Rod and Drive Mechanism	Importance:	RO / SRO 3.0 / 3.0
K/A Statement K6.02 – Knowledge of the effect that a loss or malfunction of reactor pressure will have on the control rod and drive mechanism.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

30. A hydraulic ATWS exists on Unit 2. As power is reduced, a Rod Worth Minimizer (RWM) insert rod block occurs.

Control rods can be inserted by _____.

A. placing the Rod Control switch (3A-S2) in the "IN" position

B. venting the scram air header IAW T-214 "Isolating and Venting the Scram Air Header"

C. placing the Emergency In / Notch Override switch (3A-S3) in the "EMERG ROD IN" position ONLY

D. bypassing the RWM AND placing the Emergency In / Notch Override switch (3A-S3) in the "EMERG ROD IN" position

Answer Key		
Question # 30 RO		
Choice		Basis or Justification
Correct:	D	The RWM must be bypassed in order to allow rods to be inserted in any sequence. Then the Emergency In / Notch Override switch is used to insert control rods.
Distractors:	A	An insert rod block exists. Normal rod movement with the rod control switch is prevented by the insert rod block.
	B	Since a hydraulic ATWS exists, this negates the use of T-214 to vent the scram air header.
	C	An insert rod block exists. Rod movement with the Emergency In / Notch Override switch is prevented by the insert rod block.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	T-220; M-1-S-20 Sheets 9, 12		
Learning Objective:	PLOT-1560-3		
K/A System	201006 – RWM	Importance:	RO / SRO 3.4 / 3.5
K/A Statement K4.04 – Knowledge of RWM System design feature(s) and/or interlocks which provide for system bypass.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

31. A reactor startup is in progress on Unit 2 when the variable leg for Reactor Narrow Range level becomes plugged with debris.

As the startup continues, predict the response of INDICATED level as RPV pressure rises toward rated AND what procedure, if any, would be used to correct this condition. Assume no change in actual level.

Indicated level on the affected narrow range indicators will ____(1)____.
____(2)____ would be entered to correct this condition.

A. (1) rise due to the rising pressure on the variable leg
(2) OT-110 "Reactor High Level"

B. (1) lower due to the rising pressure on the reference leg
(2) OT-100 "Reactor Low Level"

C. (1) lower due to the reduced pressure on the reference leg
(2) OT-100 "Reactor Low Level"

D. (1) remain the same as the pressure rise is felt on both the variable and reference legs equally
(2) No procedure

Answer Key		
Question # 31 RO		
Choice		Basis or Justification
Correct:	B	As the reactor vessel pressure reaches rated power conditions, the pressure on the reference leg will rise while the pressure on the variable leg will remain constant, thereby causing indicated level to lower. OT-100 would be entered for an unexpected or unexplained drop in reactor water level.
Distractors:	A	As the reactor vessel pressure reaches rated power conditions, the pressure on the reference leg will rise while the pressure on the variable leg will remain constant, thereby causing indicated level to lower.
	C	The pressure on the reference leg will rise while the pressure on the variable leg will remain constant, thereby causing indicated level to lower.
	D	As the reactor vessel pressure reaches rated power conditions, pressure on the reference and variable legs will NOT remain the same. The pressure on the reference leg will rise while the pressure on the variable leg will remain constant, thereby causing indicated level to lower.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	M-352; PLOT-5002B		
Learning Objective:	PLOT-5002B-5h		
K/A System	216000 – Nuclear Boiler Instrumentation	Importance:	RO / SRO 2.9 / 3.0
K/A Statement A2.02 – Ability to predict the impacts of instrument line plugging on Nuclear Boiler Instrumentation and based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

32. Unit 2 is in MODE 4.

- The "B" Loop of RHR is lined up in Torus Cooling using the 2D RHR pump.
- The "A" Loop of RHR is lined up in Shutdown Cooling using the 2A RHR pump.
- A fault on the E-42 bus results in annunciator 005-B1, E-42 BUS DIFFERENTIAL OR OVERCURRENT RELAYS.

Which one of the following correctly describes the effect of this event?

The E4 Diesel Generator auto starts and _____

A. loads the E42 Bus. Shutdown Cooling using the 'A' RHR Loop remains in service.

B. loads the E42 Bus. Torus Cooling using the 'B' RHR Loop remains in service.

C. does NOT load the E42 Bus. Shutdown Cooling using the 'A' RHR Loop is lost.

D. does NOT load the E42 Bus. Torus Cooling using the 'B' RHR Loop is lost.

Answer Key		
Question # 32 RO		
Choice		Basis or Justification
Correct:	D	E4 Diesel will auto start on low E-42 bus voltage, but does not load onto the E-42 bus due to the bus fault condition. With E-42 bus de-energized the 2D RHR pump has no power and therefore RHR Torus cooling is lost.
Distractors:	A	E4 Diesel output breaker is locked out from closing due to the E-42 bus fault.
	B	E4 Diesel is locked out, and the 2D RHR Pump will trip of loss of E-42 bus power.
	C	2A RHR Pump is powered from the E12 Bus. Shutdown cooling will not be lost.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ARC 005 B-1		
Learning Objective:	PLOT-5010-2a		
K/A System	219000 – RHR Torus Cooling Mode	Importance:	RO / SRO 3.1 / 3.3
K/A Statement K2.02 – Knowledge of electrical power supplies to the pumps.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

33. A large LOCA has caused the following conditions on Unit 2:

- Reactor pressure is 390 psig
- Drywell pressure is 12 psig and lowering
- Drywell sprays are in service IAW T-204 "Initiation of Containment Sprays Using RHR"

If drywell pressure continues to lower and no operator actions are taken, drywell spray will remain in service until the spray valves automatically close at _____ psig drywell pressure.

A. < 0

B. > 0 and < 1

C. > 1 and < 2

D. > 2 and < 3

Answer Key		
Question # 33 RO		
Choice		Basis or Justification
Correct:	B	If spray operation lowers drywell pressure <1 psig (spray permissive pressure is >1 psig) and the LPCI initiation signal is sealed in, the spray valves will automatically close.
Distractors:	A	If spray operation lowers drywell pressure <1 psig (before reaching 0 psig), and the LPCI initiation signal is sealed in, the spray valves will automatically close.
	C	If spray operation lowers drywell pressure <1 psig (spray permissive pressure is >1 psig) and the LPCI initiation signal is sealed in, the spray valves will automatically close.
	D	2 to 3 psig is below a reasonable Drywell pressure control band (3 to 5 psig) that a Reactor Operator could be given while spraying the Drywell using T-204 "Initiation of Containment Sprays Using RHR". The Examinee could mistake this control band as the pressure in which the spray valves will auto close since it is below the 3 to 5 psig control band.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	T-204; PLOT-5010		
Learning Objective:	PLOT-5010-6i		
K/A System	226001 – RHR Containment Spray	Importance:	RO / SRO 3.0 / 3.0
K/A Statement A3.01 –Ability to monitor automatic valve operations of the RHR/LPCI Containment Spray Mode.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

34. A LOCA occurred on Unit 2. The following conditions are present:

- Reactor level is -10 inches.
- Reactor pressure is 740 psig.
- Drywell pressure is 9 psig and rising.
- Torus Sprays are in service using the 2B RHR pump.

Subsequently, a loss of off-site power (LOOP) occurs.

- All EDGs started and energized their respective 4kV busses.

Based on these conditions, in order to re-establish Torus Sprays, the RHR pump ____(1)____ and the Torus Spray flowpath ____(2)____.

A. (1) must be manually restarted
(2) will automatically realign

B. (1) will automatically restart
(2) will automatically realign

C. (1) must be manually restarted
(2) must be manually realigned

D. (1) will automatically restart
(2) must be manually realigned

Answer Key		
Question # 34 RO		
Choice		Basis or Justification
Correct:	C	On a LOOP the normal feeder breakers will trip on undervoltage AND all breakers being fed from the 4kV bus will trip, including any RHR pumps that were in service. To re-establish Torus Spray the RHR pump will have to be manually restarted. The flowpath motor operated valves will de-energize on the LOOP, but will not realign themselves automatically. They will have to be manually closed prior to starting the RHR pump.
Distractors:	A	The flowpath motor operated valves will de-energize on the LOOP, but will not realign themselves automatically. They will have to be manually closed prior to starting the RHR pump.
	B	On a LOOP the normal feeder breakers will trip on undervoltage AND all breakers being fed from the 4kV bus will trip, including any RHR pumps that were in service. To re-establish Torus Spray the RHR pump will have to be manually restarted. The flowpath motor operated valves will de-energize on the LOOP, but will not realign themselves automatically. They will have to be manually closed prior to starting the RHR pump.
	D	The pump will not restart automatically. On a LOOP the normal feeder breakers will trip on undervoltage AND all breakers being fed from the 4kV bus will trip, including any RHR pumps that were in service.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	SO 54.7.A; T-204		
Learning Objective:	PLOT-5010-6a		
K/A System	230000 – RHR Torus Spray Mode	Importance:	RO / SRO 3.2 / 3.3
K/A Statement K1.05 – Knowledge of the physical connections and/or cause-effect relationships between RHR/LPCI: Torus Spray Mode and A.C electrical.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

35. Unit 2 is in Mode 1 at 100% power.

- There has been a loss of all Fuel Pool Service Water Booster Pumps.
- Fuel Pool temperature is 89 degrees F.
- Fuel Pool level is normal.

For the above conditions, what is an alternate source of cooling to the Fuel Pool Cooling heat exchangers in accordance with SO 19.7.A-2 "Loss of Fuel Pool Cooling"?

A. HPSW using AO 32.3-2 "HPSW Injection into the Fuel Pool"

B. RBCCW using AO 35.1-2 "RBCCW Backup to Fuel Pool Cooling"

C. RHR using AO 10.3-2 "RHR System to Fuel Pool Cross-Connect Operation"

D. ESW using AO-33.2 "Emergency Service Water System Manual Startup and Operations"

Answer Key		
Question # 35 RO		
Choice		Basis or Justification
Correct:	B	SO 19.7.A-2 prerequisite 2.1 states that IF a loss of cooling is due to a loss of Fuel Pool Service Water Booster pumps THEN the RBCCW System shall be available to supply cooling water to the Fuel Pool Cooling heat Exchangers with AO 35.1-2.
Distractors:	A	AO 32.3-2 with HPSW should only be used when it is necessary to provide Fuel Pool injection when an actual or imminent condition exists for uncovering fuel in the Fuel Pool.
	C	AO 10.3-2 with RHR will not supply alternate cooling to the Fuel Pool Cooling heat exchangers. The AO is used when there has been a complete loss of Fuel Pool Cooling or Fuel Pool Cooling is inadequate to maintain Spent Fuel Pool water temperature.
	D	The ESW System provides a safety-related cooling water supply to the Emergency Diesel Generators and ECCS Room Coolers. It does not provide an alternate cooling source for the Fuel Pool Cooling heat exchangers.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	SO 19.7.A-2; AO 35.1-2		
Learning Objective:	PLOT-5019-5a		
K/A System	233000 – Fuel Pool Cooling	Importance:	RO / SRO 2.5 / 2.7
K/A Statement K5.01 – Knowledge of the operational implications of heat removal mechanisms as it applies to Fuel Pool Cooling.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

36. Unit 2 is operating normally at 100% power when:

- FEEDWATER FIELD INSTRUMENT TROUBLE (201 H-1) goes into alarm.
- "B" main steam line flow indicator FI-2-06-088B on Panel 20C08A instantaneously fails downscale.

Which one of the following describes the response, if any, of the Digital Feedwater Control System (DFCS)?

DFCS will _____.

A. remain in three element control and maintain normal RPV water level (+23")

B. remain in three element control and maintain a higher than normal RPV water level

C. shift to single element control and maintain normal RPV water level (+23")

D. shift to single element control and maintain a lower than normal RPV water level

Answer Key		
Question # 36 RO		
Choice		Basis or Justification
Correct:	C	On a loss of 1, 2 or 3 steam flow signals DFCS will automatically transfer to single element control. As stated in Step 3.2 of OT-100, "If any feedwater flow indication is upscale or any steam line flow indication is downscale then verify the Feedwater Level Control System is operating in single element control". Since there was no plant transient (no change in actual feed flow, steam flow or RPV level), DFCS will maintain RPV level as is in single element control.
Distractors:	A	On a loss of 1, 2 or 3 steam flow signals DFCS will automatically transfer to single element control.
	B	On a loss of 1, 2 or 3 steam flow signals, DFCS will automatically transfer to single element control. Since there was no plant transient (no change in actual feed flow, steam flow or RPV level), DFCS will maintain RPV level as is.
	D	Since there was no plant transient (no change in actual feed flow, steam flow or RPV level), DFCS will maintain RPV level as is in single element control.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam – 2007 ☐ Other Exam Bank	
Reference(s):	ARC 201 H-1; SO 6C.1.D; OT-100		
Learning Objective:	PLOT-5006-6i		
K/A System	239001 – Main and Reheat Steam System	Importance:	RO / SRO 3.5 / 3.5
K/A Statement K3.15 – Knowledge of the effect that a loss or malfunction of the Main and Reheat Steam System will have on the following: Reactor Water Level Control.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

37. While performing Main Turbine shell warming in accordance with SO 1B.1.A-2 "Main Turbine Startup and Normal Operation" the operator is cautioned to ensure turbine first stage pressure remains below 100 psig.

The reason for this caution is to prevent _____.

A. rolling the main turbine off the turning gear

B. differential expansion between the turbine shell and rotor

C. exceeding the setpoint for the power-to-load unbalance (load reject) trip

D. exceeding the setpoint for the turbine stop valve and control valve scram bypass

Answer Key		
Question # 37 RO		
Choice		Basis or Justification
Correct:	D	This is stated in the CAUTION for step 4.9.10 of SO 1B.1.A-2, and also in GP-2. Note that even though the scram bypass setpoint would be exceeded if first stage pressure rose above 138 psig, a scram would not occur since the TSV/TCV low power scram bypass is locked in by procedure (GP-2, Attachment 7).
Distractors:	A	This is the reason why 6 of 10 lift pumps are secured prior to shell warming, as stated in the NOTE for step 4.9.4 of SO 1B.1.A-2.
	B	As stated in the NOTE for step 4.7 of SO 1B.1.A-2, "differential expansion concerns are addressed by the pre-warming direction provided in this procedure."
	C	The power-to-load unbalance trip receives a pressure input signal from the turbine cross-around header (HP turbine exhaust), not the turbine first stage.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	GP-2, SO 1B.1.A-2		
Learning Objective:	PLOT-5001B-1d		
K/A System	245000 – Main Turbine Generator and Auxiliaries Systems	Importance:	RO / SRO 4.6 / 4.6
K/A Statement 2.1.20 – Ability to interpret and execute procedure steps.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

38. Unit 2 is at 80% power during a plant startup.

Shortly after placing the third reactor feed pump in service, annunciator 210 H-2 "REACTOR HI-LO WATER LEVEL" alarms. The following conditions exist:

- RPV level is +31 inches and rising.
- Total feed flow is greater than total steam flow.
- "A" RFP flow is 4.1 MLBM/HR and rising.
- "B" RFP flow is 3.9 MLBM/HR and lowering.
- "C" RFP flow is 4.0 MLBM/HR and steady.

Based on the above indications, the ___(1)___ RFP is operating correctly and the ___(2)___ RFP must be taken to manual control.

A. (1) A
(2) C

B. (1) B
(2) A

C. (1) C
(2) A

D. (1) A
(2) B

Answer Key		
Question # 38 RO		
Choice		Basis or Justification
Correct:	B	If feed flow is > steam flow, RPV level will rise. The RFP master level controller will attempt to lower speed/flow for ALL RFPs. Only the "B" RFP is operating correctly. The "C" RFP control is not responding (flow is constant). The "A" RFP controller has failed because flow is rising.
Distractors:	A	"A" RFP flow is rising. The Operator should take manual control of the "A" RFP due to flow rising contrary to feedwater system control.
	C	The "C" RFP flow should be lowering in response to the high RPV water level. However, "A" RFP flow is actually rising and has an immediate detrimental effect on rising water level and should be the higher priority for manual control.
	D	"A" RFP flow is rising and is not operating properly in response to a high reactor level.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	OT-110		
Learning Objective:	PLOT-1540-4		
K/A System	259001 – Reactor Feedwater System	Importance:	RO / SRO 3.3 / 3.3
K/A Statement A1.01 – Ability to predict and/or monitor changes in parameters associated with operating the Reactor Feedwater System controls including feedwater flow/pressure.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

39. Given the following:

- Unit 2 is operating at 95% power.
- A recirculation flow reduction event results in entry into Region 2 of the Power to Flow Map.

Per OT-112 "Unexpected/Unexplained Change in Core Flow", which one of the following instrumentation responses indicates the reactor core is experiencing thermal hydraulic instability (THI)?

A. Peak-to-peak oscillations on RBM are 10% and growing larger.

B. Peak-to-peak oscillations on APRMs are 10% to 12% and their magnitude is growing larger.

C. Oscillations on WRNMs and short period alarms are received on a 10 to 20 second frequency.

D. Steady confirmation counts on the OPRM display with NO "OPRM PRE-TRIP" alarms.

Answer Key		
Question # 39 RO		
Choice		Basis or Justification
Correct:	B	Core Thermal Hydraulic Instability (THI) may be occurring if any of the following conditions exist: *Steadily increasing confirmation counts on OPRM display with few to no resets. * Any APRM flux noise signal grows by 2 or more times its initial level. * APRM flux oscillations rise greater than or equal to 10% (peak to peak).
Distractors:	A	RBM not referenced as a nuclear monitoring instrument for THI.
	C	No reference to period indication as a nuclear monitoring instrument for THI.
	D	Steadily increasing confirmation counts on OPRM display causing repetitive "OPRM Pre-trip Condition" alarms is an indication of THI.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam – 2007 ☐ Other Exam Bank	
Reference(s):	OT-112		
Learning Objective:	PLOT-1540-3		
K/A System	295001 – Partial or Complete Loss of Forced Core Flow Circulation	Importance:	RO / SRO 3.1 / 3.2
K/A Statement AA2.02 – Ability to determine and/or interpret Neutron Monitoring as it applies to Partial or Complete Loss of Forced Core Circulation.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

40. Given the following conditions on Unit 2:

- 125/250 Volt Battery Charger 2AD003 is performing an "equalize" charge on its battery.
- During the charge, AC power to the charger is lost due to a momentary loss of power to the E-12 bus.
- Power to the charger is restored in 15 seconds when the E-12 bus is reenergized by the diesel generator.

Which one of the following describes the status of the 2A Battery when the E-12 bus is reenergized?

The 2A Battery is _____.

A. in the "float" charge mode on the original charger

B. in the "equalize" charge mode on the original charger

C. in the "float" charge mode on the standby charger

D. in the "equalize" charge mode on the standby charger

Answer Key		
Question # 40 RO		
Choice		Basis or Justification
Correct:	B	From Note 2 in SO 57B.1-2 "Upon a loss of AC input power, the battery charger will return to the same mode it was in once power is restored. IF the battery charger was in the Equalize mode, THEN the timer will pick up where it was interrupted AND time out."
Distractors:	A	The charger will return to the equalize charge mode.
	C	The standby battery charger is manually placed in service only...there is no automatic transfer to the standby charger.
	D	The standby battery charger is manually placed in service only...there is no automatic transfer to the standby charger.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	SO 57B.1-2		
Learning Objective:	PLOT-5057-6a		
K/A System	295003 – Partial or Complete Loss of A.C. Power	Importance:	RO / SRO 3.2 / 3.5
K/A Statement AA2.03 – Ability to determine and/or interpret Battery status as it applies to Partial or Complete Loss of A.C. Power			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

41. Given the following:

- Unit 2 is operating at 100% power.
- An electrical transient results in a blown output fuse on battery charger 2BD003-1.
- Prior to the transient, charger 2BD003-1 was supplying the Division II 250 VDC bus.

Assuming no operator action, the Division II 250 VDC bus is now being supplied by the _____.

A. 2B station battery ONLY

B. 2D station battery ONLY

C. 2B AND 2D station batteries

D. 2B station battery AND in-service 2D charger

Answer Key		
Question # 41 RO		
Choice		Basis or Justification
Correct:	D	When the output breaker for charger 2BD003-1 trips, the charger no longer supplies power to the Division II 250 VDC bus. The bus loads would then be supplied by the 2B battery and the in-service 2D charger.
Distractors:	A	When the output breaker for charger 2BD003-1 trips, the charger no longer supplies power to the Division II 250 VDC bus. The bus loads would then be supplied by the 2B battery and the 2D charger.
	B	The 2B battery will supply the 250 VDC loads along with the 2D charger.
	C	The 2D charger remains in service supplying the 250 VDC loads along with the 2B battery.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	E-26		
Learning Objective:	PLOT-5057-3c		
K/A System	295004 – Partial or Complete Loss of D.C. Power	Importance:	RO / SRO 3.1 / 3.1
K/A Statement AK2.01 – Knowledge of the interrelations between Partial or Complete Loss of D.C. Power and Battery Charger.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

42. Given the following:

- A plant startup is in progress on Unit 2
- The main turbine is in Shell Warming
- The "EHC 125V DC LOSS TRIP" annunciator is received and a turbine trip occurs

Which one of the following identifies the positions of the Turbine Control Valves (TCV), Intercept Valves (IV), and Intermediate Stop Valves (ISV) for these conditions?

	TCV	IV	ISV
A.	Open	Closed	Closed
B.	Closed	Closed	Open
C.	Closed	Closed	Closed
D.	Open	Open	Closed

Answer Key		
Question # 42 RO		
Choice		Basis or Justification
Correct:	C	A loss of 125 VDC results in a turbine trip at less than 1400 RPM, as indicated by the annunciator. Even though the turbine is initially in Shell Warming, all listed turbine valves close on a turbine trip condition.
Distractors:	A	This is the initial lineup while in Shell Warming, prior to the turbine trip condition.
	B	The ISVs will also close on a turbine trip condition.
	D	All listed turbine valves will close on the trip condition.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	M-302; M-303; M-304; ARC 206 C-4		
Learning Objective:	PLOT-5001B-4a		
K/A System	295005 – Main Turbine Generator Trip	Importance:	RO / SRO 3.1 / 3.1
K/A Statement AA2.03 – Ability to determine and/or interpret Turbine Valve Position as it applies to Main Turbine Generator Trip.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

43. Given the following:

- Unit 3 was scrammed from full power due to a loss of both Recirc pumps
- Reactor water level is 20 inches and steady
- All control rods are fully inserted
- The scram can NOT be reset

Which one of the following explains why CRD flow is required to be minimized IAW SO 3.2.A-3 "Control Rod Hydraulic System Shutdown"?

A. To prevent CRD pump runout.

B. To stop input to the scram discharge volume.

C. To prevent damage to CRD mechanism seals.

D. To limit thermal stratification in the RPV bottom head.

Answer Key		
Question # 43 RO		
Choice		Basis or Justification
Correct:	D	As stated in T-100 Bases, and Step 4.1 of SO 3.2.A-3.
Distractors:	A	CRD Hydraulic System design (orifice) prevents CRD pump runout following a scram.
	B	Following a scram, input to the SDV is stopped once it is filled and becomes solid.
	C	This is not the reason for minimizing CRD system flow following a scram.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	T-100 Bases, SO 3.2.A-3		
Learning Objective:	PLOT-PBIG-2100-T100-9		
K/A System	295006 – Scram	Importance:	RO / SRO 3.5 / 3.6
K/A Statement AA1.06 – Ability to operate and/or monitor the CRD Hydraulic System as it applies to a Scram.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

44. Per the UFSAR, which one of the following statements describes the reason for disabling control room controls IAW SE-10 "Plant Shutdown from the Alternative Shutdown Panels" after abandoning the control room?

A. To maintain High Pressure Coolant Injection (HPCI) System automatic operation.

B. To ensure interlocks associated with operation of safe shutdown equipment are defeated.

C. To ensure fire-induced circuit faults will NOT prevent operation of safe shutdown equipment.

D. To prevent simultaneous operation from the control room and the Alternative Shutdown Panels.

Answer Key		
Question # 44 RO		
Choice		Basis or Justification
Correct:	C	From the UFSAR: "transfer/isolation switches provide electric circuit isolation between alternative shutdown circuits and circuits that could be affected by a fire in one of the four areas of concern (control room, cable spreading room, computer room, emergency shutdown panel area)." From 10CFR50, Appendix R: "The safe shutdown equipment and systems for each fire area shall be known to be isolated from associated non-safety circuits in the fire area so that hot shorts, open circuits, or shorts to ground in the associated circuits will not prevent operation of the safe shutdown equipment."
Distractors:	A	HPCI system automatic system operation (trips, isolations and automatic start) is defeated when control is transferred to the Alternative Shutdown Panel.
	B	Interlocks are defeated when operation is transferred to the Alternative Shutdown Panels, but this is not the design basis reason for disabling Control Room controls.
	D	This could be (and is) accomplished procedurally; it is not the design basis reason for disabling Control Room controls.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	SE-10; UFSAR FPP, Ch. 5		
Learning Objective:	PLOT-1555-9		
K/A System	295016 – Control Room Abandonment	Importance:	RO / SRO 3.5 / 3.7
K/A Statement AK3.03 – Knowledge of the reasons for the following responses as they apply to CONTROL ROOM ABANDONMENT: Disabling control room controls			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

45. Unit 3 was operating at full power when the following transient occurred:

- "A" RBCCW pump tripped due to an overcurrent condition.
- "B" RBCCW pump started automatically but at a reduced discharge pressure.
- RBCCW system temperatures are rising steadily.

Under these conditions, ON-113 "Loss of RBCCW" directs the RWCU pumps tripped and the system isolated.

According to the ON-113 Bases, the reason for these actions is to:

A. Isolate a likely primary-to-secondary leak in the RBCCW heat exchangers.

B. Allow more time to diagnose and correct the cause of the RBCCW problem.

C. Prevent RWCU pump cavitation due to high reactor water inlet temperatures.

D. Reduce the required RBCCW system flow rate thereby preventing pump runout.

Answer Key		
Question # 45 RO		
Choice		Basis or Justification
Correct:	B	Removing RWCU from service removes a significant heat load which will greatly slow the heatup of the RBCCW system, thereby providing more time to correct the problem.
Distractors:	A	A primary-to-secondary leak in the RBCCW heat exchanger is plausible, but is not what the isolation of the system is based on according to ON-113 Bases.
	C	Although the RWCU pump inlet temperatures could rise, these steps are not based on preventing this condition.
	D	Although isolating RWCU will reduce the required heat input to the system, it does not reduce RBCCW system flow rate because the isolation occurs on the Reactor Water side of the system.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam – 2005 ☐ Other Exam Bank	
Reference(s):	OT-113 Bases		
Learning Objective:	PLOT-1550-03		
K/A System	295018 – Partial or Total Loss of CCW	Importance:	RO / SRO 2.9 / 3.2
K/A Statement AK3.01 – Knowledge of the reasons for securing individual components as it applies to Partial or Total Loss of Component Cooling Water.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

46. Given the following:

- Unit 2 was initially operating at 100% power
- A complete loss of Instrument Air occurred
- T-261 "Placing The Backup Instrument Nitrogen Supply From CAD Tank In Service" was implemented due to loss of both Instrument Nitrogen compressors

Based on these conditions, which Main Steam Isolation Valves (MSIVs), if any, have a long-term pneumatic supply?

A. Inboard ONLY

B. Outboard ONLY

C. BOTH the inboard AND outboard

D. NEITHER the inboard NOR outboard

Answer Key		
Question # 46 RO		
Choice		Basis or Justification
Correct:	A	The inboard MSIVs are supplied with Instrument N2 from both the 'A' and 'B' Instrument N2 headers; the CAD tank (T-261) backs up the 'B' Instrument N2 header. Instrument Air supplies the outboard MSIVs. Therefore, there is a long-term pneumatic source to the inboard MSIVs but not the outboard MSIVs.
Distractors:	B	The outboard MSIVs are supplied by Instrument Air.
	C	The outboard MSIVs are supplied by Instrument Air.
	D	The inboard MSIVs are supplied by Instrument N2.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ON-119; M-333; M-351; T-261		
Learning Objective:	PLOT-5001A-1k, -1w		
K/A System	295019 – Partial or Complete Loss of Instrument Air	Importance:	RO / SRO 3.4 / 3.4
K/A Statement AK2.05 – Knowledge of the interrelationship between Partial or Complete Loss of Instrument Air and Main Steam System.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

47. Unit 2 has just entered Mode 4 in preparation for a refueling outage.

A failure of MO-2-10-018 "Shutdown Cooling Inboard Isolation" results in a loss of Shutdown Cooling and necessitates establishing Alternate Shutdown Cooling using SRV's and Torus Cooling, per AO 10.12-2 "Alternate Shutdown Cooling."

Conditions have been established as follows:

- Torus Cooling is in service using the '2A' RHR pump
- The '2E' and '2H' SRV control switches are in the OPEN position
- Injection to the RPV has been established with the '2D' RHR pump
- RPV level is 150 inches and steady on Refuel Range (LI-86)
- RPV pressure is 30 psig and steady
- Torus pressure is 0 psig and steady

Which one of the following describes the action required in order to establish Alternate Decay Heat removal?

____(1)____ RPV injection until RPV _____(2)_____.

A. (1) Lower
(2) level is < 100 inches

B. (1) Raise
(2) level is > 200 inches

C. (1) Lower
(2) pressure is < 25 psig

D. (1) Raise
(2) pressure is > 50 psig

Answer Key		
Question # 47 RO		
Choice		Basis or Justification
Correct:	D	A 50 psig D/P is required across the SRV's in order for them to open and establish alternate heat removal.
Distractors:	A	While 108 inches is an important milestone in OT-110, Reactor High Level, when trying to prevent filling the Main Steam lines, filling them is required for this procedure in order to establish flow through the SRV(s).
	B	RPV level at 150 inches is high enough to fill the Main Steam lines. At 30 psig RPV pressure, LI-86 is reasonably accurate.
	C	In order to establish alternate heat removal the SRV's must open, which requires a 50 psig D/P between the RPV and Torus. The given conditions require raising reactor pressure, not lowering.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☒ Previous NRC Exam (LGS – 2006) ☐ Other Exam Bank	
Reference(s):	AO 10.12		
Learning Objective:	PLOT-5001A-5f; PLOT-5007-1f		
K/A System	295021 – Loss of Shutdown Cooling	Importance:	RO / SRO 3.7 / 3.7
K/A Statement AA1.04 – Ability to operate and or monitor Alternate Heat Removal Methods as they apply to Loss of Shutdown Cooling.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

48. Unit 2 is in a refueling outage.

- Fuel is being loaded into the reactor pressure vessel.
- The fuel being loaded is NOT directly adjacent to any WRNM.

Which one of the following conditions requires entry into ON-124 "Fuel Floor and Fuel Handling Problems"?

WRNM ___(1)___ ___(2)___ between Core Component Transfer Authorization Sheet (CCTAS) steps during fuel handling.

A. (1) period
(2) doubles

B. (1) period
(2) doubles two times

C. (1) count rate
(2) doubles

D. (1) count rate
(2) doubles two times

Answer Key		
Question # 48 RO		
Choice		Basis or Justification
Correct:	D	ON-124 entry is required if/when WRNM count rate "doubles two times between CCTAS steps" during fuel handling. ON-124 directs operator actions to ensure inadvertent criticality does not occur during fuel handling activities.
Distractors:	A	Not an ON-124 entry condition.
	B	Not an ON-124 entry condition.
	C	Not an ON-124 entry condition.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ON-124		
Learning Objective:	PLOT-1550-27		
K/A System	295023 – Refueling Accidents	Importance:	RO / SRO 4.2 / 4.1
K/A Statement G2.4.31 – Knowledge of annunciator alarms, indications, or response procedures.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

49. Given the following conditions:

- A large break LOCA has occurred
- Drywell pressure reached a maximum of 22 psig
- Torus sprays have NOT been placed in service
- Drywell sprays are in service
- Drywell pressure is 18 psig and lowering

While spraying the drywell under these conditions IAW T-102 "Primary Containment Control", the Torus-to-Drywell Vacuum Breakers will ____(1)____ and the Reactor Building-to-Torus Vacuum Breakers will ____(2)____.

A. (1) cycle OPEN
(2) cycle OPEN

B. (1) cycle OPEN
(2) remain CLOSED

C. (1) remain CLOSED
(2) cycle OPEN

D. (1) remain CLOSED
(2) remain CLOSED

Answer Key		
Question # 49 RO		
Choice		Basis or Justification
Correct:	B	As drywell pressure continues to lower, the torus-to-drywell vacuum breakers will open to maintain torus-to-drywell d/p < 0.5 psid (Tech Spec value). Since torus pressure remains well above the opening setpoint for the reactor building-to-torus vacuum breakers of 0.75 psid (Tech Spec value), these vacuum breakers will not open.
Distractors:	A	The reactor building-to-torus vacuum breakers remain closed provided torus pressure remains > 0.75 psid above reactor building pressure. Spraying the drywell IAW T-102 will ensure this happens.
	C	The torus-to-drywell vacuum breakers will open to maintain torus-to-drywell d/p < 0.5 psid (Tech Spec value). The reactor building-to-torus vacuum breakers remain closed provided torus pressure remains > 0.75 psid above reactor building pressure. Spraying the drywell IAW T-102 will ensure this happens.
	D	The torus-to-drywell vacuum breakers will open to maintain torus-to-drywell d/p < 0.5 psid (Tech Spec value).

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	Tech Spec 3.6.1.5 / 3.6.1.6		
Learning Objective:	PLOT-5007-5a		
K/A System	295024 – High Drywell Pressure	Importance:	RO / SRO 3.4 / 3.4
K/A Statement EA1.16 – Ability to operate and/or monitor Containment/Drywell vacuum breakers.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

50. Given the following conditions:

- Unit 2 was initially operating at 100% power when a Group I isolation occurred.
- Reactor pressure peaked at 1300 psig, at which time the reactor scrammed on high drywell pressure.
- All Safety Relief Valves (SRVs) and Safety Valves (SVs) cycled to relieve pressure during the event.

Based on these conditions, the safety function of RPS was ____(1)____ and the safety function of the SRVs and SVs was ____(2)____ during this transient.

A. (1) OPERABLE
(2) OPERABLE

B. (1) OPERABLE
(2) NOT OPERABLE

C. (1) NOT OPERABLE
(2) OPERABLE

D. (1) NOT OPERABLE
(2) NOT OPERABLE

Answer Key		
Question # 50 RO		
Choice		Basis or Justification
Correct:	C	The safety function of RPS was not operable; the safety function of the SRVs and SVs is operable.
Distractors:	A	The safety function of RPS was not operable since a scram did not occur on MSIV closure, high RPV pressure, or high neutron flux.
	B	The safety function of RPS was not operable since a scram did not occur on MSIV closure, high RPV pressure, or high neutron flux. The safety function of the SRVs and SVs is operable since, collectively, they operated to limit RCBP pressure to below the Safety Limit (1325 psig).
	D	The safety function of the SRVs and SVs was operable.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	Tech Spec 2.1.2, 3.4.3 and Bases		
Learning Objective:	PLOT-5001A-7; PLOT-5060F-7		
K/A System	295025 – High Reactor Pressure	Importance:	RO / SRO 3.6 / 4.6
K/A Statement G2.2.37 – Ability to determine operability and/or availability of safety related equipment.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

51. A transient occurred on Unit 3 that resulted in the following plant parameters:

- Reactor pressure: 900 psig
- Drywell pressure: 18 psig
- Drywell temperature: 235 degrees F
- Torus pressure: 16 psig
- Torus temperature: 145 degrees F
- Torus level: 15 feet

Which one of the following conditions will cause the margin to the Heat Capacity Temperature Limit (HCTL) to be reduced?

A. RPV pressure lowers

B. Torus level lowers

C. Torus pressure rises

D. Drywell temperature rises

Answer Key		
Question # 51 RO		
Choice		Basis or Justification
Correct:	B	Lowering Torus level will cause the HCTL to be more restrictive.
Distractors:	A	Lowering RPV pressure will cause the HCTL to be less restrictive.
	C	Torus pressure has no effect on HCTL.
	D	Drywell temperature has no effect on HCTL.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	TRIP/SAMP Curves, Table and Limits – Bases		
Learning Objective:	PLOT-PBIG-2100-T102-4, -5a		
K/A System	295026 – Suppression Pool High Water Temperature	Importance:	RO / SRO 3.5 / 3.7
K/A Statement EK2.06 – Knowledge of the interrelations between Suppression Pool High Water Temperature and Suppression Pool Level.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

52. Technical Specification LCO 3.6.1.4 "Drywell Air Temperature" must be entered when drywell average air temperature initially exceeds __(1)__ degrees F and is applicable in mode(s) ____(2)____.

A. (1) 145
(2) 1 ONLY

B. (1) 145
(2) 1, 2 and 3

C. (1) 200
(2) 1 ONLY

D. (1) 200
(2) 1, 2 and 3

Answer Key		
Question # 52 RO		
Choice		Basis or Justification
Correct:	B	TS 3.6.1.4 entry is required when drywell average air temperature 145 degrees F, and is applicable in modes 1, 2 and 3. T-102 is also entered at 145 degrees F Drywell temperature.
Distractors:	A	TS 3.6.1.4 entry is required when drywell average air temperature 145 degrees F, and is applicable in modes 1, 2 and 3. T-102 requires a GP-4 scram and RPV depressurization at 200 degrees F, but this is well beyond the Tech Spec LCO for Drywell temperature.
	C	TS 3.6.1.4 entry is required when Drywell average air temperature reaches 145 degrees F and is applicable in modes 1, 2 and 3.
	D	TS 3.6.1.4 entry is required when Drywell average air temperature reaches 145 degrees F.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	Tech Spec 3.6.1.4		
Learning Objective:	PLOT-5007-8		
K/A System	295028 – High Drywell Temperature	Importance:	RO / SRO 4.0 / 4.7
K/A Statement G2.2.22 – Knowledge of limiting conditions for operations and safety limits.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

53. Why does T-102 "Primary Containment Control" require an Emergency Blowdown to be performed when Torus water level CANNOT be maintained above 10.5 feet?

In order to _____.

A. ensure the HPCI vortex limit is NOT exceeded

B. minimize the driving force of the primary system breach

C. depressurize the reactor before the SRV tailpipes are uncovered

D. depressurize the reactor before the downcomer vents are uncovered

Answer Key		
Question # 53 RO		
Choice		Basis or Justification
Correct:	D	T-102 Bases identifies a level of 10.5 feet as the level of the downcomers, and directs an Emergency Blowdown.
Distractors:	A	The HPCI vortex limit is below 9.5 feet, which is the level at which HPCI must be secured in order to prevent uncovering the HPCI exhaust line.
	B	A Torus break is not a primary system breach.
	C	T-102 Bases identifies a level of 10.5 feet as the level of the downcomers, and directs an Emergency Blowdown, whereas the SRV tailpipes are at a level of 7 feet.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	T-102 and Bases; SAMP-2 Bases		
Learning Objective:	PLOT-1560-9		
K/A System	295030 – Low Suppression Pool Water Level	Importance:	RO / SRO 3.8 / 4.1
K/A Statement EK3.01 – Knowledge of the reasons for Emergency Depressurization as it applies to Low Suppression Pool Water Level.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

54. Given the following:

- Unit 2 was shutdown 20 hours ago.
- The 2D RHR pump is lined up in shutdown cooling.
- RPV pressure is 30 psig.
- RPV level is 25 inches.

The following conditions occur:

- RPV level lowers to -10 inches.
- All appropriate PCIS isolations occur.

Per ON-125 "Loss or Unavailability of Shutdown Cooling", raising RPV level to > +50 inches is necessary to _____.

A. satisfy Technical Specification requirements of forced RPV coolant circulation

B. reset the Group II isolation in order to return shutdown cooling to service

C. promote natural circulation and help prevent stagnation of coolant in the core

D. restore decay heat removal capabilities to prevent a heatup of the reactor coolant system

Answer Key		
Question # 54 RO		
Choice		Basis or Justification
Correct:	C	As stated in ON-125 Bases, "raising RPV level to > +50" promotes natural circulation and helps prevent stagnation of coolant in the core."
Distractors:	A	Raising RPV level to > +50" only promotes natural circulation. To satisfy Tech Spec requirements for forced circulation a Recirc or RHR pump must be in service.
	B	While restoring level to > +1 inch would allow the rest of Group II isolation, level need only be raised above the Group II setpoint of 1 inch, not to > +50".
	D	RPV level > +50 inches will promote natural circulation, but it is not a form of adequate decay heat removal.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ON-125 and Bases		
Learning Objective:	PLOT-1550-3		
K/A System	295031 – Reactor Low Water Level	Importance:	RO / SRO 3.8 / 4.1
K/A Statement EK1.02 – Knowledge of the operational implications of Natural Circulation as it applies to Reactor Low Water Level.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

55. Unit 2 is operating at 100% power when a Turbine Trip occurs. Two minutes later the following conditions are observed:

- Reactor power is 0%
- Rod 26-11 is at position "48"
- Rod 50-31 is at position "48"
- Rod 22-51 is at position "48"
- All other control rods are at "00"

Subsequently, the URO begins to insert rods.

Which one of the following describes control rod positions that meet the criteria for termination of an ATWS?

A. Rods 26-11, 50-31, and 22-51 are at position "04".

B. Rods 26-11 and 50-31 are at position "02", AND rod 22-51 is at position "04".

C. Rods 26-11 and 50-31 are at position "00", AND rod 22-51 is at position "48".

D. Rod 26-11 is at position "00", AND rods 50-31 and 22-51 are at position "48".

Answer Key		
Question # 55 RO		
Choice		Basis or Justification
Correct:	C	Meets the Tech Spec definition of shutdown margin with the single strongest rod fully withdrawn and all other rods fully inserted.
Distractors:	A	Does not meet the Tech Spec SDM criteria.
	B	Criteria stipulate that if one rod is fully withdrawn or less, all other rods must be fully inserted. Having one out and all others to or beyond "02" does not meet the definition.
	D	Does not meet the Tech Spec SDM criteria.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☒ Previous NRC Exam (LGS – 2006) ☐ Other Exam Bank	
Reference(s):	T-101 (Note 24); Tech Spec definition of Shutdown Margin		
Learning Objective:	PLOT-PBIG-2100-T101-4, -6		
K/A System	295037 – SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown	Importance:	RO / SRO 4.2 / 4.3
K/A Statement EA 2.05 – Ability to determine and/or interpret Control Rod Position as it applies to Scram Condition Present and Reactor Power Above APRM Downscale or Unknown.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

56. What is the reason for performing an emergency blowdown as it applies to T-104 "Radioactivity Release"?

A. Establish or maintain adequate core cooling.

B. Prevent exceeding the General Emergency offsite release limit.

C. Preserve the pressure-suppression function of the primary containment.

D. Reduce the discharge of reactor coolant from un-isolated primary system breaks.

Answer Key		
Question # 56 RO		
Choice		Basis or Justification
Correct:	D	Per T-104 Bases, "An emergency depressurization is required when the offsite radioactive release rate cannot be maintain below the GE level and the primary system causing the radioactive release has not been isolated. This emergency blowdown may be performed prior to reaching the GE threshold since an earlier blowdown could reduce onsite and offsite doses. However, an earlier emergency blowdown may not be advisable in all events."
Distractors:	A	This is not a reason for performing an emergency blowdown for T-104.
	B	Performing an emergency blowdown per T-104 does not prevent exceeding the GE offsite release limit.
	C	This is not a reason for performing an emergency blowdown for T-104.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	T-104 Bases		
Learning Objective:	PLOT-PBIG-2100-T104-5		
K/A System	295038 – High Off-Site Release Rate	Importance:	RO / SRO 3.6 / 3.9
K/A Statement EK3.04 – Knowledge of the reasons for Emergency Depressurization as it applies to High Offsite Release Rate.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

57. The Plant Reactor Operator (PRO) has just received a fire alarm from the Turbine Building. The Fire Brigade has been dispatched.

In accordance with FF-01 "Fire Brigade", the PRO is required to call for OFFSITE fire fighting support _____.

A. immediately if the fire spreads into two or more T-300 fire areas

B. immediately if plant safe shutdown systems or ECCS are in jeopardy

C. after 15 minutes if the Incident Commander reports the fire is NOT extinguished

D. after 20 minutes if the Incident Commander reports the fire is NOT under control

Answer Key		
Question # 57 RO		
Choice		Basis or Justification
Correct:	D	Correct, per FF-01.
Distractors:	A	The size of the fire is not defined by FF-01.
	B	This is a requirement from ON-114 to scram the reactor.
	C	This is associated with the time limit for performing EAL classifications.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	FF-01 Notes		
Learning Objective:	PSEG-0214L-03		
K/A System	600000 – Plant Fire On Site	Importance:	RO / SRO 2.9 / 3.1
K/A Statement AK1.02 – Knowledge of the operational implications of the following concepts as they apply to Plant Fire On-Site: Fire Fighting.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

58. Unit 2 is operating with the following conditions:

- Main Generator volts: 21.9 KV
- Main Generator MW: 1100 MWe
- Main Generator VARS: 120 MVARS
- Hydrogen pressure: 60 psig

A grid disturbance results in steadily rising grid voltage.

The Main Generator voltage regulator responds as designed by attempting to lower Main Generator terminal voltage.

With no operator action, this transient could result in _____.

Refer to the PBAPS "Generator Capability Curve" (Figure 1 of AO 50.7-2) PROVIDED SEPARATELY.

A. exceeding the Generator Under Excitation Limit

B. overheating the Main Generator stator windings

C. a Generator Lockout due to reverse power relay trip

D. a Generator Lockout due to field over-excitation relay trip

Answer Key		
Question # 58 RO		
Choice		Basis or Justification
Correct:	A	With no operator action, if grid voltage rises above generator output voltage, generator VARS will lower. If the voltage mismatch is large enough, VARS could lower to the point where the generator is operating in the OUT (LEAD) area of the Generator Capability Curve, and possibly to the point at which the Under Excitation Limit (UEL) is exceeded.
Distractors:	B	This could happen if generator voltage was higher than grid voltage to the point where picking up additional VARS would result in exceeding the capability curve (B-C) for 60 psig hydrogen pressure.
	C	A reverse power trip occurs when real load (MW) is reduced to the point where the grid supplies the generator. The given conditions would not result in lowering MW, especially to the point of reverse power.
	D	Field over-excitation results from too high field current, which can be caused by the voltage regulator raising generator output voltage (VARS) too high.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	AO 50.7-2		
Learning Objective:	PLOT-5050-6f		
K/A System	700000 – Generator Voltage and Electric Grid Disturbances	Importance:	RO / SRO 3.3 / 3.4
K/A Statement AK1.03 – Knowledge of the operational implications of under-excitation as it applies to Generator Voltage and Electric Grid Disturbances			
REQUIRED MATERIALS:	**Figure 1 of AO 50.7-2**		
Notes and Comments:			

59. During a high reactor pressure transient on Unit 2, the Plant Reactor Operator notes the following Safety Relief Valve (SRV) indications:

- 11 SRV white lights are illuminated.
- Three SRV red lights are illuminated.
- All other SRV green lights are illuminated.
- No safety valve white lights are illuminated.

What was the minimum peak reactor pressure during this transient and what is the approximate current reactor pressure?

	Minimum Peak Pressure	Approximate Current Pressure
A.	1135 psig	1135 psig
B.	1145 psig	1145 psig
C.	1155 psig	1135 psig
D.	1260 psig	1145 psig

Answer Key		
Question # 59 RO		
Choice		Basis or Justification
Correct:	C	SRV setpoints range form 1135 psig to 1155 psig. If all 11 white memory lights are lit, then pressure reached 1155 psig. With three SRVs still open (red lights lit), pressure is at lowest range value of 1135 psig.
Distractors:	A	If 1135 psig was the peak pressure only 4 SRV's would have the white memory lights lit.
	B	If 1145 psig was the peak pressure only 8 SRVs would have the white memory lights lit.
	D	1260 psig is the setpoint for safety valve (not SRV) actuation.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	Tech Spec 3.4.3		
Learning Objective:	PLOT-5001A-4d		
K/A System	295007 – High Reactor Pressure	Importance:	RO / SRO 3.9 / 4.1
K/A Statement AA1.04 – Ability to operate and/or monitor Safety/Relief valves as they apply to High Reactor Pressure.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

60. A plant startup is in progress on Unit 3. The crew is conducting HPCI surveillance testing in accordance with ST-O-023-301-3 "HPCI Pump, Valve, Flow and Unit Cooler Functional and In-service Test."

The reason for placing Torus cooling in service during this surveillance test is to prevent exceeding the _____.

A. HPCI booster pump NPSH limit

B. HPCI cooling water temperature limit

C. Torus heat capacity temperature limit

D. Torus temperature limit of Technical Specifications

Answer Key		
Question # 60 RO		
Choice		Basis or Justification
Correct:	D	Per Tech Spec 3.6.2.1, suppression pool temperature shall be less than or equal to 105 degrees F when at or above 1% power (on any WRNM channel) and testing that adds heat to the suppression pool is being performed. Reactor power has to be above the POAH to perform HPCI testing. Per ST-O-023-301-3, Note 1 of Step 6.4, "...torus cooling is placed in service to ensure the 105 degree F torus temperature limit is not reached."
Distractors:	A	The HPCI booster pump NPSH limit is well above the maximum allowed torus temperature during testing (105 degrees F).
	B	The HPCI cooling water limit is well above the maximum allowed torus temperature during testing (105 degrees F).
	C	C is incorrect – the HCTL is well above the maximum allowed torus temperature during testing (105 degrees F).

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ST-O-023-301-3; Tech Spec 3.6.2.1		
Learning Objective:	PLOT-5007-1k, -8		
K/A System	295013 – High Suppression Pool Water Temperature	Importance:	RO / SRO 3.6 / 3.8
K/A Statement AK3.01 – Knowledge of the reasons for Suppression Pool cooling operation as it applies to High Suppression Pool Water Temperature.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

61. The following conditions exist on Unit 2:

- Reactor power is 100%
- An inadvertent Group II/III isolation resulted in loss of chilled water to the drywell
- TI-80146 "Drywell Bulk Average Temperature Indicator" is presently inoperable
- While performing RT-O-40C-530-2 "Drywell Temperature Monitoring" the crew determined that ALL TI-2501 Zone 1 temperature points (119 through 124) are out of service
- TI-2501 Point 136 reads 132 degrees F

Which of the following procedures must be entered?

Refer to RT-O-40C-530-2 "Drywell Temperature Monitoring" PROVIDED SEPARATELY.

	ON-120 "High Drywell Temperature"	T-102 "Primary Containment Control"
A.	Yes	No
B.	No	Yes
C.	Yes	Yes
D.	No	No

Answer Key		
Question # 61 RO		
Choice		Basis or Justification
Correct:	A	Per ON-120 Bases (and RT Notes), if TI-80146 is unavailable then TI-2501 points should be used to determine Drywell Bulk Average Temperature Further, if all points in a zone are unavailable, the calculated temperature is invalid. In this case, the operator is directed to use TI-2501 Point 136 (or TR-804) and add 10 degrees F to determine Drywell Bulk Average Temperature. For the given conditions (142 degrees F), entry into ON-120 is required, but T-102 entry is not.
Distractors:	B	ON-120 entry is required if Drywell temperature is above 140 degrees F; T-102 entry is not required.
	C	T-102 entry is not required until Drywell temperature exceeds 145 degrees F.
	D	ON-120 entry is required if Drywell temperature is above 140 degrees F.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ON-120 Bases; RT-O-40C-530-2		
Learning Objective:	PLOT-PBIG-1550-3		
K/A System	295020 – Inadvertent Containment Isolation	Importance:	RO / SRO 3.3 / 3.4
K/A Statement AA2.02 - Ability to determine and/or interpret Drywell temperature as it applies to Inadvertent Containment Isolation.			
REQUIRED MATERIALS:	**RT-O-40C-530-2**		
Notes and Comments:			

62. A startup is being performed on Unit 3. The following conditions and trends are observed:

- Reactor pressure is 850 psig and steady.
- At time 11:25 AM 'B CRD PUMP TRIP' (311 G-1) annunciator is received.
- At time 11:30 AM the 'A' CRD pump is started but immediately trips.
- At time 11:33 AM, several accumulator trouble lights illuminate on the Full Core Display for withdrawn control rods.
- At time 11:37 AM, CRD Charging Header pressure is 940 psig and lowering.

In accordance with ON-107 "Loss of CRD Regulating Function", based on the above conditions you are required to ____(1)____ at time ____(2)____.

A. (1) perform a Manual Scram
(2) 11:37 AM

B. (1) perform a Manual Scram
(2) 11:57 AM

C. (1) insert control rods in reverse order of the approved sequence
(2) 11:37 AM

D. (1) insert control rods in reverse order of the approved sequence
(2) 11:57 AM

Answer Key		
Question # 62 RO		
Choice		Basis or Justification
Correct:	A	Per ON-107, if reactor pressure is < 900 psig, charging header pressure is < 940 psig, and all control rods with accumulator trouble indicators lit are not fully inserted, a scram is required immediately…there is not a 20-minute allowance.
Distractors:	B	20 minutes to restore charging header pressure once the condition of both multiple accumulator trouble alarms and low (< 940 psig) CRD charging header pressure is only allowed when reactor pressure is > 900 psig.
	C	The time is correct but the action (GP-9) is incorrect.
	D	The time and action (GP-9) are both incorrect.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ON-107; Tech Spec 3.1.5		
Learning Objective:	PLOT-1550-12a		
K/A System	295022 – Loss of CRD Pumps	Importance:	RO / SRO 4.2 / 4.2
K/A Statement G2.4.47 – Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

63. Unit 3 is operating at 100% power when the following conditions occur:

- HIGH AREA TEMP (310 J-3) goes into alarm.
- Point #2 on TRS-3-13-139 (RCIC room) is 120 degrees F and rising.
- ALL other points on TRS-3-13-139 are below the alarm level.
- T-103 "Secondary Containment Control" has been entered.
- A steam leak in the RCIC room has been confirmed.

What are the operational implications if RCIC room temperature continues rising and exceeds 135 degrees F?

Refer to T-103 Table SC/T on the NEXT PAGE.

1. RCIC will automatically isolate.

2. RCIC will be required to be manually isolated.

3. A reactor scram will be required if RCIC CANNOT be isolated.

4. An emergency blowdown will be required if RCIC CANNOT be isolated.

A. 1 and 3

B. 1 and 4

C. 2 and 3

D. 2 and 4

T-103 "Secondary Containment Control"

TABLE SC/T-3
TEMPERATURE-ALARM AND ACTION LEVELS

AREA	ALARM LEVEL (°F)	ACTION LEVEL (°F)	INSTRUMENT TRS-2(3)-13-139 PT # (UNLESS SPECIFIED OTHERWISE)	STATUS
TORUS ROOM	115	135	PT 8,9,14,15,20, OR 24	
RCIC ROOM OR HPCI ROOM	110 110	135 150	PT 2 PT 3	
A RHR ROOM OR C RHR ROOM	110 110	135 135	PT 17 PT 29	
B RHR ROOM OR D RHR ROOM	110 110	135 135	PT 23 PT 6	
A CS ROOM OR C CS ROOM	110 110	135 135	TI-2(3)501 PT 151 TI-2(3)501 PT 152	
B CS ROOM OR D CS ROOM	110 110	135 135	TI-2(3)501 PT 153 TI-2(3)501 PT 154	
STEAM TUNNEL	175	UNIT 2: 230; UNIT 3: 190	PT 1 OR 16	
A ISOL VALVE ROOM (SOUTH)	165	190	PT 12	
B ISOL VALVE ROOM (NORTH)	165	190	PT 18 OR 21	
ISOL VALVE PIT 165' EL	140	150	PT 30	
RWCU REGEN HX ROOM OR A NON REGEN HX ROOM OR B NON REGEN HX ROOM OR A OR B RWCU FLTR DEMIN ROOM OR RWCU BACKWASH VALVE ROOM	160 130 130 115 105	NO ACTION LEVEL	PT 11 PT 28 PT 5 PT 10 OR 27 PT 4	
GENERAL AREA 165' EL (MAY AFFECT RPV LEVEL INST)	105	135	PT 22	

Answer Key		
Question # 63 RO		
Choice		Basis or Justification
Correct:	C	Both #2 and #3 are correct. T-103, step SC/T-4 will direct isolating RCIC (isolate all systems discharging into the area...). T-103, step SCC-8 will direct a reactor scram if a primary system is discharging into the Reactor Building and any parameter exceeds an action level.
Distractors:	A	#1 is incorrect. RCIC will not automatically isolate until RCIC area temperatures (RCIC room, pipe chase) reach 200 degrees F (Tech Spec value).
	B	#1 is incorrect. RCIC will not automatically isolate until RCIC area temperatures (RCIC room, pipe chase) reach 200 degrees F (Tech Spec value). # 4 is incorrect. T-112 "Emergency Blowdown" is not required until the same parameter exceeds an action level in more than one area (and if the "primary system breach" has not been isolated).
	D	# 4 is incorrect. T-112 "Emergency Blowdown" is not required until the same parameter exceeds an action level in more than one area (and if the "primary system breach" has not been isolated).

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ARC 310 J-3; T-103 and Bases		
Learning Objective:	PLOT-1560-3		
K/A System	295032 – High Secondary Containment Area Temperature	Importance:	RO / SRO 3.5 / 3.9
K/A Statement EK1.03 – Knowledge of the operational implications of Secondary Containment leakage detection as it applies to High Secondary Containment Area Temperature.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

64. A small steam leak has been reported in the Unit 2 Reactor Building. The following conditions are present:

- There are NO ARMs in alarm
- Reactor Zone Vent Exhaust is reading above normal but NOT in alarm
- 2 VENT EXH STACK RAD MONITOR HI/TROUBLE A (218 B-5) is alarming
- 2 VENT EXH STACK RAD MONITOR HI/TROUBLE B (218 C-5) is alarming
- 2 VENT EXH STACK RAD MONITOR HI-HI A (218 B-4) is alarming

Based on the above conditions, which one of the following actions is required?

A. Enter ON-104 "Vent Stack High Radiation" and T-103 "Secondary Containment Control".

B. Enter ON-104 "Vent Stack High Radiation" and T-104 "Radioactivity Release Control".

C. Enter T-103 "Secondary Containment Control" ONLY.

D. Enter T-104 "Radioactivity Release Control" ONLY.

Answer Key		
Question # 64 RO		
Choice		Basis or Justification
Correct:	B	ON-104 and T-104 must both be entered (and executed concurrently).
Distractors:	A	The given conditions do not require entry into T-103.
	C	The given conditions do not require entry into T-103.
	D	ON-104 entry is also required.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ARC-218 B-4; ON-104; T-104		
Learning Objective:	PLOT-2104-1		
K/A System	295034 – Secondary Containment Ventilation High Radiation	Importance:	RO / SRO 3.8 / 4.5
K/A Statement G2.4.8 – Knowledge of how abnormal operating procedures are used in conjunction with EOPs.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

65. Unit 2 is operating at 100% power when the following occur:

- C RHR PUMP ROOM FLOOD (224 C-5) annunciator is received
- The crew enters T-103 "Secondary Containment Control"
- An Equipment Operator reports a leak from the 2C RHR heat exchanger

Which one of the following will occur as a result of these conditions?

A. Flood alarms in the other (A, B, or D) RHR pump rooms due to backflow through the floor drain system.

B. Increased influent into the Waste Collector Tank due to additional input from the 2C RHR Room Sump.

C. Increased pump out of the Reactor Building Equipment Drain Sump due to overflow from the 2C RHR Room Sump.

D. Increased pump out of the Reactor Building Floor Drain Sump due to additional input from the 2C RHR Room Sump.

Answer Key		
Question # 65 RO		
Choice		Basis or Justification
Correct:	D	The RHR Room Sumps are pumped directly to the RB Floor Drain Sump, which will cause the sump pumps to operate more frequently.
Distractors:	A	Per Note in ARC 224 C-5, "floor drains are plugged during power operation to prevent flooding in more than one room. Per T-103 Bases, "only one ECCS room flood alarm should be received for an ECCS suction piping rupture." One must infer the same is true for an RHR heat exchanger leak.
	B	The RHR Room Sumps are pumped to the RB Floor Drain Sump, which is pumped to the Floor Drain Collector Tank, not the Waste Collector Tank.
	C	The RHR Room Sumps are pumped directly to the RB Floor Drain Sump, which overflows to the RB Equipment Drain Sump. The RHR Room Sumps do not overflow to the RB Equipment Drain Sump.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ARC 224 C-5; T-103 Bases; M-368, M-518		
Learning Objective:	PLOT-5020-1c, -1d		
K/A System	295036 – Secondary Containment High Sump/Area Water Level	Importance:	RO / SRO 3.1 / 3.2
K/A Statement K2.01 – Knowledge of the interrelations between Secondary Containment High Sump/Area Water Level and Secondary Containment Equipment and Floor Drain System.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

66. In accordance with OP-PB-108-101-1001 "Simple Quick Acts/Transient Acts", which one of the following tasks can be performed by Reactor Operators during a transient, as directed by the CRS, without immediate procedure references?

A. Manual initiation of Standby Liquid Control.

B. Manual driving of control rods during an ATWS.

C. Manual adjustment of HPCI/RCIC speed to control injection.

D. Manual initiation of HPCI via individual component manipulation.

Answer Key		
Question # 66 RO		
Choice		Basis or Justification
Correct:	C	OP-PB-108-101-1001, step 3.1.8, considers adjusting process controllers in automatic to maintain a process parameter a "Transient Act".
Distractors:	A	Initiating SBLC is not listed under "Transient Acts" (tasks that can be performed by reactor operators during a transient as directed by the CRS without immediate procedure reference). Therefore, the Rapid Response Card is required.
	B	This is not a "Transient Act"; T-200 procedure is required.
	D	This is not a "Transient Act"; Rapid Response Card is required.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	OP-PB-108-101-1001		
Learning Objective:	PLOT-1529-1j		
K/A System	N/A	Importance:	RO / SRO 3.8 / 4.2
K/A Statement G2.1.1 – Knowledge of conduct of operations requirements.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

67. A Reactor Operator (RO) accrued the following working hours while working a forced outage. He does NOT have an authorized "Overtime Guideline Deviation Authorization" form.

Sunday	NO HOURS
Monday	06:00 - 16:00
Tuesday	07:00 - 20:00
Wednesday	06:30 - 17:00
Thursday	07:00 - 20:00
Friday	06:00 - 22:30
Saturday	08:00 - 18:00

Identify by number which guidelines of LS-AA-119 "Overtime Controls" the RO violated.

1. 16 hours in a 24 hour period
2. 24 hours in a 48 hour period
3. 72 hours in any 7 day period

A. 1 and 2 ONLY

B. 1 and 3 ONLY

C. 2 and 3 ONLY

D. 1, 2, and 3

Answer Key		
Question # 67 RO		
Choice		Basis or Justification
Correct:	D	16 hours in a 24 hour period was violated on Friday (16.5 hours). 24 hours in a 48 hour period was violated on Friday (29.5 hours), and again on Saturday (26.5 hours). The number of hours worked in a 7 day period totaled 73.
Distractors:	A	72 hours in a 7 day period was also violated.
	B	24 hours in a 48 hour period was also violated.
	C	16 hours in a 24 hour period was also violated.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank – LORT	
Reference(s):	LS-AA-119		
Learning Objective:	PLOT-1570-3		
K/A System	N/A	Importance:	RO / SRO 2.9 / 3.9
K/A Statement G2.1.5 – Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

68. A plant start-up and heat-up is in progress on Unit 3 in accordance with GP-2 "Normal Plant Start-up". Both recirc pumps are in service and the following data has been collected:

	RPV DRAIN TEMP	"A" RECIRC LOOP TEMP	"B" RECIRC LOOP TEMP
0915	221 degrees F	250 degrees F	252 degrees F
0930	250 degrees F	275 degrees F	278 degrees F
0945	275 degrees F	305 degrees F	308 degrees F
1000	310 degrees F	335 degrees F	337 degrees F
1015	319 degrees F	349 degrees F	364 degrees F

Which one of the following describes (1) the current heat-up rate and (2) the required/allowed actions?

The plant heat-up rate is _____.

A. (1) within the Tech Spec LCO limit.
(2) Additional control rods may be withdrawn in accordance with the NF-AB-720 approved sequence.

B. (1) NOT within the Tech Spec LCO limit.
(2) Insert control rods in the reverse order of the NF-AB-720 approved sequence.

C. (1) within the GP-2 administrative limit.
(2) Additional control rods may be withdrawn in accordance with the NF-AB-720 approved sequence.

D. (1) NOT within the GP-2 administrative limit.
(2) Insert control rods in accordance with GP-9-3 "Fast Reactor Power Reduction".

Answer Key		
Question # 68 RO		
Choice		Basis or Justification
Correct:	B	Heatup rate is in excess of the 100oF/hour TS limit (B Recirc loop delta temperature from 09:15 to 10:15 = 112 F) GP-2 requires the operator to insert control rods in reverse order of the NF-AB-720 approved sequence.
Distractors:	A	It is NOT within the TS limit, and is outside of the administrative heat up rate defined in GP-2 (90 degrees F).
	C	Heatup rate is not within the GP-2 administrative limit.
	D	Although heatup rate is outside the 90 degree F/hour limit, GP-2 requires control rod insertion in reverse order of the NF-AB-720 approved sequence (vice the GP-9-3 sequence direction).

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	GP-2, ST-O-080-500-3		
Learning Objective:	PLOT-DBIG-1530-4		
K/A System	N/A	Importance:	RO / SRO 4.4 / 4.7
K/A Statement G2.1.7 – Ability to evaluate plant performance and make operational judgments based on operating characteristics, .reactor behavior, and instrument interpretation.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

69. Unit 2 and Unit 3 are at 100% power.

Using Print E-1 "Single Line Station Diagram" PROVIDED SEPARATELY, determine the automatic system response to a 5014 Line fault.

A. The 215 breaker trips ONLY, then attempts to reclose.

B. The 205 and 215 breakers will BOTH trip, then ONLY the 205 breaker attempts to reclose.

C. The 215 breaker trips ONLY, then the Unit 2 Main Generator will lockout.

D. The 205 breaker trips ONLY and its associated motor operated disconnects will open.

Answer Key		
Question # 69 RO		
Choice		Basis or Justification
Correct:	B	Breakers 205 and 215 will open on the fault and only the 205 breaker will attempt reclosure. The 215 breaker is a Unit output breaker and does not have a reclosure feature.
Distractors:	A	The 215 breaker is a Unit output breaker and does not have a reclosure feature. Also, for a fault on the 5014 Line the 205 breaker would trip open as well.
	C	The Unit 2 Main Generator will not lockout. Output breaker 225 will remain closed.
	D	Breakers 205 and 215 will open on the fault. The 205 and 215 breaker motor operated disconnects are manually operated ONLY.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	E-1, Sheet 1; Wiring Diagram AB-201752 & AB-201754		
Learning Objective:	PLOT-5051-6		
K/A System	N/A	Importance:	RO / SRO 3.9 / 4.3
K/A Statement G2.2.15 – Ability to determine the expected plant configuration using design and configuration control documentation, such as drawings, line-ups, tag-outs, etc.			
REQUIRED MATERIALS:	**Print E-1, Sheet 1, Station Single Line Diagram**		
Notes and Comments:			

70. Given the following:

- MO-2-23-057 "HPCI Torus Suction Outboard" was declared INOPERABLE for preventative maintenance.
- Following maintenance, operators performed a stroke test on MO-2-23-057 using a partial ST-O-023-301-2 "HPCI Pump, Valve, Flow and Unit Coolers Functional and In-service Test".

The stroke test data is shown below:

6.1.11 **OPEN AND TIME** MO-2-23-057 "HPCI Torus Suct Outboard".

MEASURED VALUE (Sec)	RETEST VALUE (Sec) Ref 4.3.5	ALERT RANGE (Sec) Ref 4.3.4	LIMITING VALUE (Sec) Ref 4.3.3	INITIAL SAT UNSAT
87.3		< 56.5 > 76.5	86.5	I_____ [redacted]

Based on the guidance in ST-O-023-301-2 and NOM-P-11.1 "Operability", MO-2-23-057 _____.

A. must remain INOPERABLE

B. must be retested to determine operability

C. is OPERABLE pending Engineering review

D. operability status is indeterminate

Answer Key		
Question # 70 RO		
Choice		Basis or Justification
Correct:	A	Per ST-O-023-301-2 Limitation 4.3.2, any valve that exceeds its limiting stroke time criteria shall be immediately declared inoperable.
Distractors:	B	This applies to valves that stroke-tested in the alert range initially and then again during a re-test.
	C	This applies to valves that stroke-tested in the alert range initially and then again during a re-test.
	D	Per NOM-P-11.1 there is no "indeterminate" status. The component is either operable or inoperable.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ST-O-023-301-2; NOM-P-11.1		
Learning Objective:	PLOT-DBIG-1529-1c		
K/A System	N/A	Importance:	RO / SRO 2.9 / 4.1
K/A Statement G2.2.21 – Knowledge of pre- and post-maintenance operability requirements.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

71. An operator is needed to perform a filter alignment in an area where the general area radiation level is 60 mR/hr.

- The job will take 30 minutes for one operator, but can be completed in 20 minutes with two operators.
- Area radiation levels could be reduced to 30 mR/hr with shielding.
- It will take 20 minutes for one individual to install shielding.

To ensure the job dose is maintained "As Low As Reasonably Achievable", ____(1)____ operator(s) should perform the lineup ____(2)____ shielding.

Consider <u>total</u> personnel dose only.

A. (1) one
(2) with

B. (1) one
(2) without

C. (1) two
(2) with

D. (1) two
(2) without

Answer Key		
Question # 71 RO		
Choice		Basis or Justification
Correct:	B	1 individual to perform lineup without shielding is a total exposure of 30 mR/hr (30 minutes in a 60 mR/hr field).
Distractors:	A	1 individual to install shielding is 20 mR/hr (20 minutes in a 60 mR/hr field), plus one individual to perform lineup is 15 mR/hr (30 minutes in a 30 mR/hr field), for a total exposure of 35 mR/hr.
	C	1 individual to install shielding is 20 mR/hr (20 minutes in a 60 mR/hr field), plus two individuals to perform lineup is 20 mR/hr (20 minutes in a 30 mR/hr field, times 2), for a total exposure of 40 mR/hr.
	D	2 individuals to perform lineup without shielding is a total exposure of 40 mR/hr (20 minutes in a 60 mR/hr field, times 2).

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	RP-AA-400		
Learning Objective:	PLOT-1770-2, -3		
K/A System	N/A	Importance:	RO / SRO 3.2 / 3.7
K/A Statement G2.3.12 – Knowledge of the radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

72. Unit 2 is operating at 100% power when a steam leak occurs in the Reactor Building.

- The Reactor Building exhaust duct radiation monitors reach the PCIS Group III setpoint.
- All systems operate as expected EXCEPT that all SBGT filter inlet dampers fail to open.

Which one of the following would result from this event? (Assume no operator action.)

A. Higher release rates through the Main Stack due to fission products not being adequately filtered.

B. An unfiltered ground-level radioactive release due to the Reactor Building not being maintained at negative pressure.

C. Higher release rates through the Unit 2 Vent Stack due to forced flow from the Reactor Building.

D. A monitored ground-level radioactive release due to the Reactor Building not being maintained at negative pressure.

Answer Key		
Question # 72 RO		
Choice		Basis or Justification
Correct:	B	The Group III PCIS isolation will trip and isolate Reactor Building ventilation. The failed filter inlet dampers will prevent SBGT from maintaining Reactor Building negative pressure. This will result in an unmonitored and unfiltered ground-level release.
Distractors:	A	SBGT would not be exhausting Reactor Building air to the Main Stack.
	C	Reactor Building ventilation dampers close on a PCIS Group III isolation and isolate the Reactor Building from the Vent Stack.
	D	The release would not be through a monitored path.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	T-103 Bases (step SCC-2)		
Learning Objective:	PLOT-5009A-3a		
K/A System	N/A	Importance:	RO / SRO 3.4 / 3.8
K/A Statement G2.3.14 – Knowledge of radiation or contamination hazards that may arise during normal, abnormal or emergency conditions or activities.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

73. An ATWS is in progress on Unit 2. Per T-117 "Level/Power Control", a priority action is to inhibit ADS.

This is done to prevent _____.

A. core damage due to large irregular neutron flux oscillations

B. exceeding 110 degrees F Torus temperature before boron is injected

C. potential loss of, or inaccuracies in, RPV level instrumentation

D. substantial fuel damage due to a large reactor power excursion

Answer Key		
Question # 73 RO		
Choice		Basis or Justification
Correct:	D	The ADS safety function is inhibited to give priority to other systems (i.e , provide additional time for SLC, RPS, etc. to perform their safety functions). From T-117 Bases: ADS initiation would complicate efforts to maintain RPV level within required level ranges. FURTHER, rapid and uncontrolled injection of large volumes of relatively cold, un-borated water from low pressure injection systems may occur. With the reactor either critical or shutdown on boron alone, the positive reactivity addition due to boron dilution and temperature reduction may result in a reactor power excursion large enough to cause substantial fuel damage. ADS is inhibited to prevent this from happening.
Distractors:	A	ADS initiation would not cause large irregular neutron flux oscillations...it would cause a rapid reduction in reactor power due to voids.
	B	During an ATWS Torus temperature may exceed 110 degrees F before boron injection anyway due to SRV operation...this is not the reason for inhibiting ADS.
	C	Depressurization due to ADS initiation must also be accompanied by elevated Drywell temperature for this to occur...this is not the reason for inhibiting ADS.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			N/A

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	T-117 Bases		
Learning Objective:	PLOT-2117-5a		
K/A System	N/A	Importance:	RO / SRO 3.6 / 4.0
K/A Statement G2.4.22 – Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

74. While HPCI was injecting into the RPV, the Control Room had to be abandoned.

An operator was sent to the Unit 2 HPCI Alternative Shutdown panel and placed the HPCI Transfer/Isolation switches in "EMERGENCY".

AFTER the transfer was completed, the following conditions are observed at the Alternative Shutdown Panel:

- Reactor level (LI-2-2-3-112) is 0 inches and rising
- Reactor pressure is 350 psig and steady
- CST LEVEL LOW (233 A-1) annunciates

Based on these conditions, HPCI will _____.

A. trip due to low suction pressure

B. re-align its suction path to the Torus

C. remain running with suction from the CST

D. trip due to placing the HPCI Transfer/Isolation switches in "EMERGENCY"

Answer Key		
Question # 74 RO		
Choice		Basis or Justification
Correct:	C	HPCI suction swap to the Torus is defeated following transfer of control to the Alternative Shutdown Panel. Therefore, the HPCI suction path will remain aligned to the CST.
Distractors:	A	HPCI auto trips are defeated following transfer of control to the Alternative Shutdown Panel.
	B	HPCI interlocks are defeated following transfer of control to the Alternative Shutdown Panel.
	D	HPCI does not trip when control is transferred to the Alternative Shutdown Panel.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☒ Other Exam Bank – LORT	
Reference(s):	SE-10 Attachment 9; ARC-233 A-1; M-1-S-36		
Learning Objective:	PLOT-5023-4r		
K/A System	N/A	Importance:	RO / SRO 4.2 / 4.1
K/A Statement G2.4.34 – Knowledge of the RO tasks performed outside the main control room during an emergency and the resultant operational effects.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

75. Unit 2 is operating at 80% power when several Control Room annunciators are received, including the following:

- A CONDENSATE PUMP BRK TRIP (203-E2)
- REACTOR HI-LO WATER LEVEL (210-H2)
- GENERATOR PROTECTION CIRCUIT ENERGIZED (206-L1)

The alarms have been validated.

Prioritize these alarms and determine the required operator action.

A. Perform GP-4 "Manual Scram".

B. Perform GP-9-2 "Fast Reactor Power Reduction".

C. Insert ALL GP-9-2 Appendix 1 control rods ONLY.

D. Verify A and B Recirc Pumps runback to 45%.

Answer Key		
Question # 75 RO		
Choice		Basis or Justification
Correct:	A	A valid GENERATOR PROTECTION CIRCUIT ENERGIZED annunciator indicates a loss of Stator Cooling. OT-113 directs a manual scram IAW GP-4 if a valid loss of Stator Cooling exists and generator load is greater than 7760 amps (~23% reactor power).
Distractors:	B	This action is directed by OT-100 for a low reactor water level condition based on availability of makeup capability. This action would be appropriate if it weren't for the loss of Stator Cooling condition.
	C	Inserting ALL GP-9-2 rods is required by OT-112 only if a Recirc pump trip has occurred...none of the given conditions indicate a Recirc pump has tripped.
	D	The given conditions indicate a trip of the 'A' Condensate pump, which would result in a Recirc runback to 45% if Feedwater flow was > 85%. With the Unit at 80% power, Feedwater flow is < 85%; therefore, a Recirc runback will not occur when the Condensate pump trips.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			N/A

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam – 2007 ☐ Other Exam Bank	
Reference(s):	GP-9-2; GP-4; OT-100; OT-112; OT-113		
Learning Objective:	PLOT-1540-3		
K/A System	N/A	Importance:	RO / SRO 4.1 / 4.3
K/A Statement G2.4.45 – Ability to prioritize and interpret the significance of each annunciator or alarm.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

1. Restoration of ST-O-011-301-2 "Standby Liquid Control Pump Functional Test for IST" has been completed.

   HV-2-11-15 "SBLC Discharge Header to RPV Outboard Isolation Valve" was inadvertently left in the CLOSED position. Refer to the portion of P&ID M-358, Sheet 1, provided on the NEXT PAGE.

   Subsequently, Unit 2 is manually scrammed due to loss of both CRD pumps. An ATWS occurs.

   - The CRS directs SBLC placed in-service
   - The URO places SBLC in service using RRC 11.1-2 "SBLC System Initiation During a Plant Event" and reports the following:
     - Both squib valves fired
     - SBLC pump discharge pressure is 1400 psig
     - RWCU is isolated

   Identify the correct response to these conditions per T-101 "RPV Control".

   Refer to the portion of T-101 provided AFTER THE NEXT PAGE.

   Perform _____.

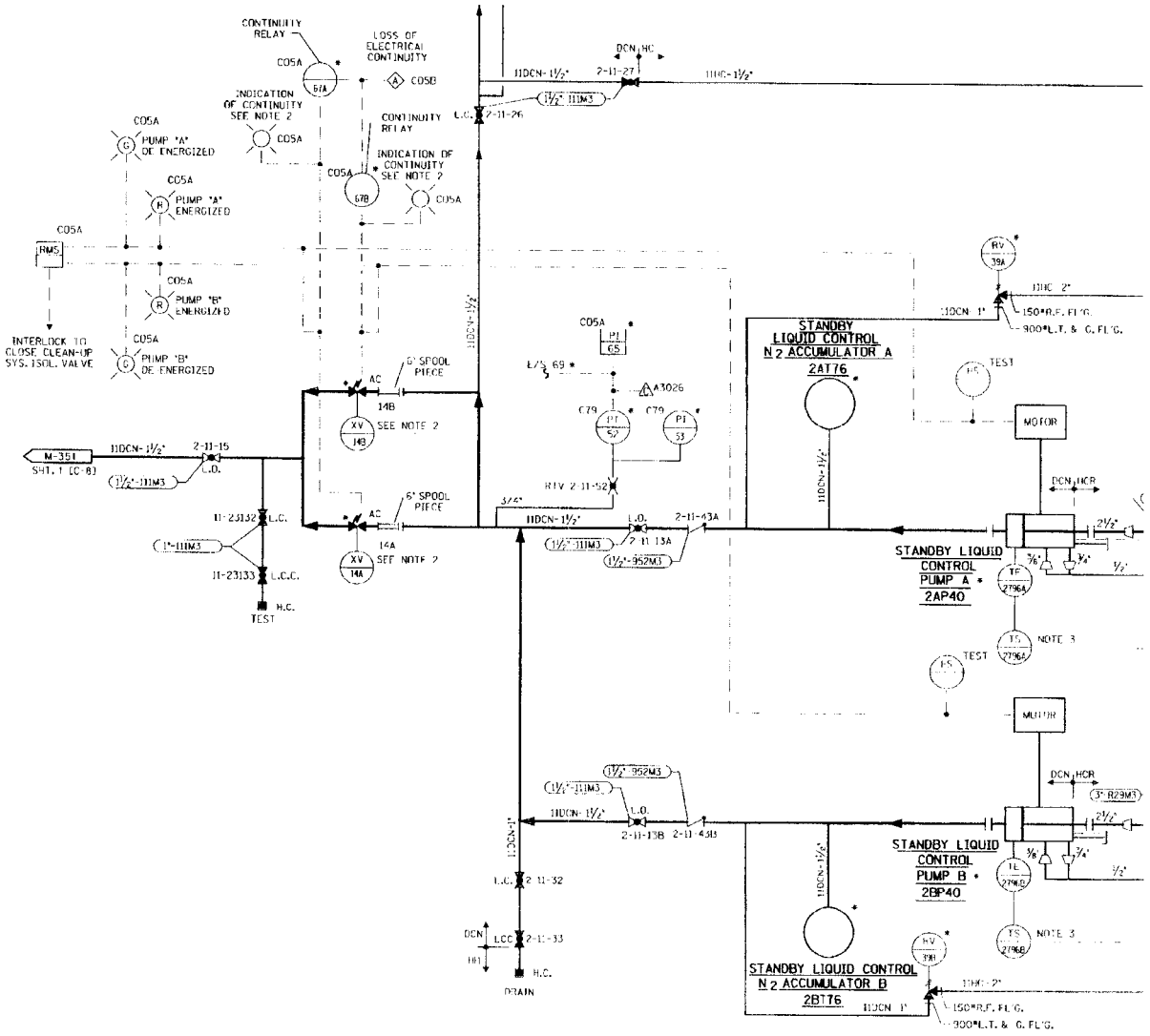
   A. T-101 "RPV Control" step RC/Q-16

   B. T-210 "CRD System SBLC Injection"

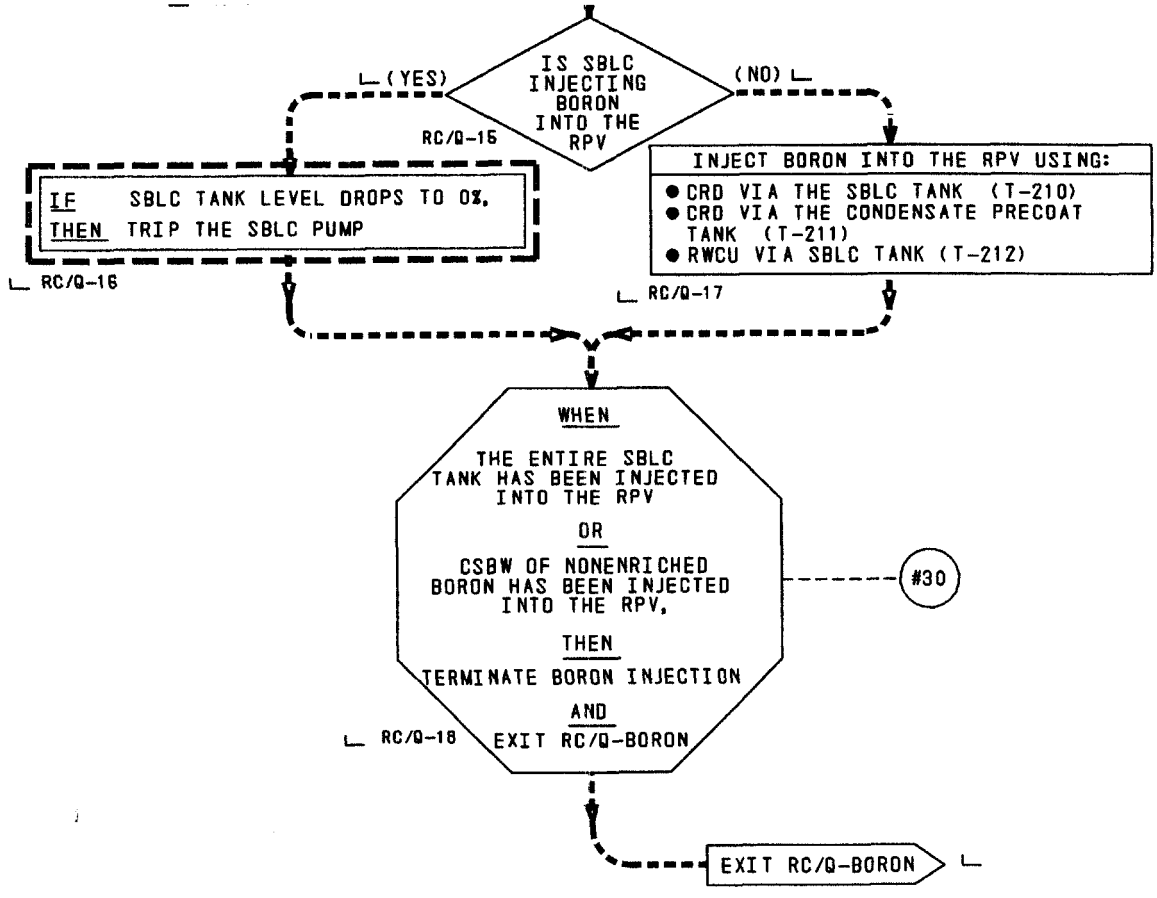
   C. T-211 "CRD System Non-enriched Boric Acid and Borax Injection"

   D. T-212 "RWCU System SBLC Injection"

P&ID M-358, Sheet 1



T-101 "RPV Control"



Answer Key		
Question # 1 SRO		
Choice		Basis or Justification
Correct:	D	Based on the given conditions, SBLC is not injecting into the RPV: 1400 psig pump discharge pressure indicates the SBLC pump discharge relief valve is lifting (due to the closed header isolation valve). T-210 and T-211 cannot be performed without at least one CRD system pump available. Therefore, T-212 is the only option available, which can be implemented even though RWCU is isolated.
Distractors:	A	Execution of T-101 step RC/Q-16 is based on SBLC injecting into the RPV. SBLC will not inject into the RPV with header isolation valve HV-2-11-15 closed.
	B	The candidate must know that T-210 cannot be performed without at least one CRD system pump available. In other words, use of T-210 requires CRD system piping and an available CRD pump.
	C	The candidate must know that T-211 cannot be performed without at least one CRD system pump available. In other words, use of T-211 requires CRD system piping and an available CRD pump.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(5)

Source Documentation		
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank
Reference(s):	P&ID M-358, Sheet 1; ST-O-011-301-2	
Learning Objective:	PLOT-5011-4h	
K/A System	211000 – Standby Liquid Control	Importance: SRO 3.2
K/A Statement A2.07 – Ability to (a) predict the impacts of valve closures on the Standby Liquid Control System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

2. An ATWS condition exists on Unit 2.

The Unit RO and the PRO have been reporting the following data to the Unit Supervisor:

Time in minutes	APRM Power Level (%)	Reactor Water Level (inches)	Drywell Pressure (psig)	Torus Temp (degrees F)
0	24	-23	4	87
2	20	-10	6	92
3	12	-30	7	96
4	3	-75	9	99
6	5	-55	10	100

The HPCI system is being used for RPV level control.

Based on the above set of data, what step of T-117 "Level /Power Control" must be performed next?

Refer to T-117 PROVIDED SEPARATELY.

Step _____.

A. LQ-11

B. LQ-13

C. LQ-18

D. LQ-31

Answer Key		
Question # 2 SRO		
Choice		Basis or Justification
Correct:	B	With reactor power initially >4% AND Torus Temperature <110 degrees F, T-117 step LQ-13 will require performance of T-240 Attachment 1 Figure 1 to lower RPV level < -60 inches. If RPV level goes above -60 inches AND reactor power goes >4% during performance of subsequent T-117 steps, check/re-check step LQ-15 directs re-entry at step LQ-6, which will require re-performance of step LQ-13 to lower RPV level < -60 inches.
Distractors:	A	Step LQ-11 would only be performed if Torus temperature was > 110 degrees F. The highest Torus temperature was 97 degrees F.
	C	With RPV level above -60 inches and reactor power > 4%, check/re-check step LQ-15 directs re-entry at step LQ-6, which will require re-performance of step LQ-13 to lower RPV level < -60 inches. Step LQ-18 would only be performed if RPV level was not intentionally lowered to control reactor power.
	D	With RPV level above -60 inches and reactor power > 4%, check/re-check step LQ-15 directs re-entry at step LQ-6, which will require re-performance of step LQ-13 to lower RPV level < -60 inches. Step LQ-31 would not be performed NEXT.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(5)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	T-117		
Learning Objective:	PLOT-PBIG-2117-3		
K/A System	215005 – APRM/LPRM	Importance:	SRO 4.2
K/A Statement G2.4.47 – Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.			
REQUIRED MATERIALS:	**T-117 "Power/Level Control"**		
Notes and Comments:			

3. Unit 2 had a stuck open SRV and was shutdown using GP-4 "Manual Scram."

Subsequent damage to the SRV tailpipe resulted in a steam leak into the Drywell. The following conditions exist:

- Reactor Water Level is -20 inches and rising rapidly
- RPV pressure is 240 psig and lowering
- Drywell pressure is 9 psig and rising
- Torus pressure is 6 psig and rising
- Torus temperature is 182 degrees F and rising
- 2B Core Spray pump is injecting at 3600 gpm
- RCIC is injecting at 600 gpm
- CST level is 4.5 feet

Predict the impact of these conditions on the RCIC System to determine the required procedural direction.

Refer to the portion of T-102 "Primary Containment Control" and the RCIC NPSH Curve provided on the NEXT PAGE.

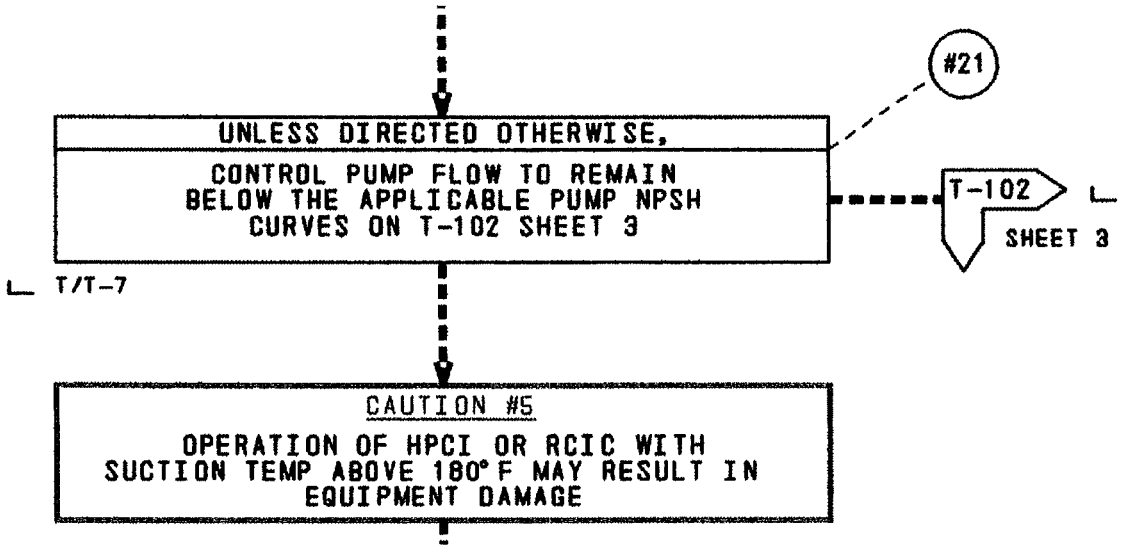
A. Continue to inject with RCIC using RRC 13.1-2 "RCIC System Operation During a Plant Event."

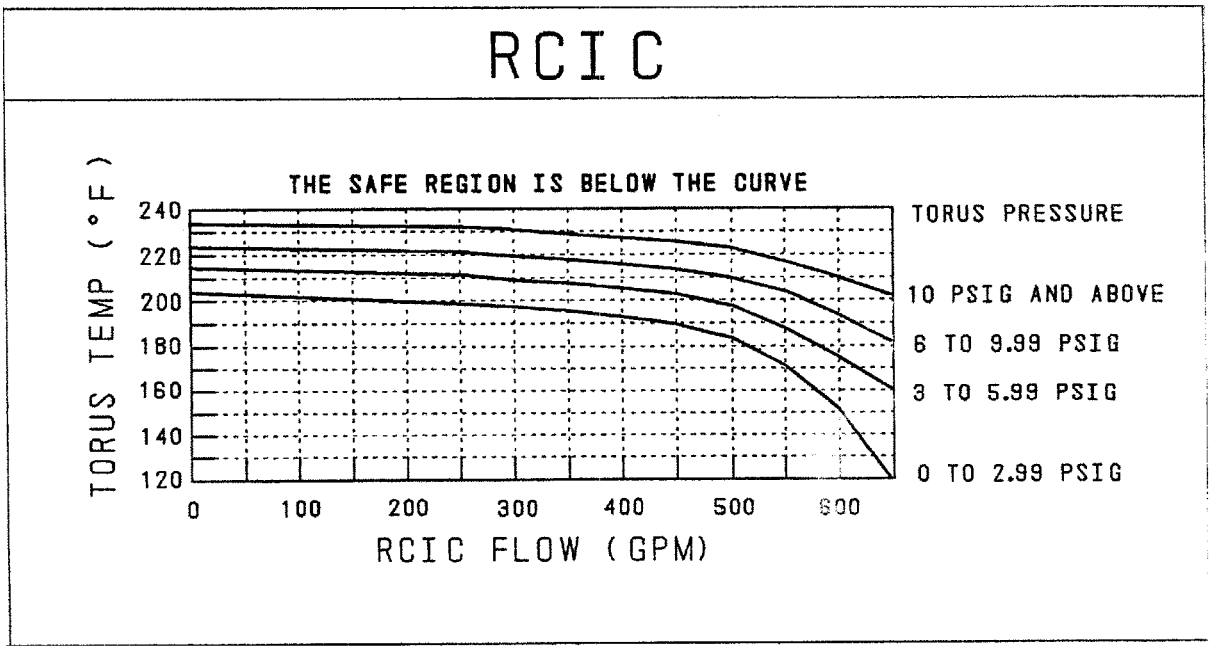
B. Lower RCIC system flow to ensure adequate NPSH using RRC 13.1-2 "RCIC System Operation During a Plant Event."

C. Remove RCIC from service using RRC 13.1-2 "RCIC System Operation During a Plant Event" due to high Torus temperature and adequate core cooling.

D. Defeat the auto open signal to the Torus suction valves using AO 13.3-2 "RCIC Torus Suction Valve, Defeat of Auto Open Signal" and realign RCIC suction to the Torus.

T-102 "Primary Containment Control"





Answer Key		
Question # 3 SRO		
Choice		Basis or Justification
Correct:	C	RCIC suction automatically swaps to the Torus when CST level is < 5.25 feet. T-102 CAUTION #5 bases states that Torus temperatures above 180 degrees F can cause high bearing oil temperature, which can lead to possible bearing damage and control valve operational issues. Since RCIC operation is NOT required for adequate core cooling, RCIC should be shutdown using RRC 13.1-2 "RCIC System Operation During a Plant Event" (this should be used to secure the system since it was used to put the system in service following the transient).
Distractors:	A	RCIC System operation is not required for adequate core cooling. Based on T-102, Caution #5, Torus temperature above 180 degrees F can lead to possible bearing damage and control valve operational issues. Per T-102 bases, the equipment (RCIC) "may still be used if required to maintain adequate core cooling." Adequate core cooling can be maintained by 2B Core Spray.
	B	For the given Torus water temperature and pressure, per T-102 sheet 3, RCIC NPSH is adequate.
	D	This choice suggests transferring RCIC suction from the Torus (due to high Torus temperature) back to the CST. However, use of AO 13.3-2 is only used when RCIC logic bus 'A' power cannot be restored, which is not the case here. RCIC suction cannot be transferred back to the CST due to the low CST level (< 5.25 feet).

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(5)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	T-102 and Bases		
Learning Objective:	PLOT-5011-4d		
K/A System	217000 – Reactor Core Isolation Cooling	Importance:	SRO 3.1
K/A Statement A2.08 – Ability to (a) predict the impacts of loss of lube oil cooling on the RCIC System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

4. Given the following:

- Unit 2 is operating at 100% power.
- Core alterations are in progress on Unit 3.
- The 'A' SBGT filter train is determined to be inoperable.

Refer to Technical Specification 3.6.4.3 PROVIDED SEPARATELY to determine how these conditions apply to (1) Unit 2 and (2) Unit 3.

A. (1) Unit 2 operation may continue for up to 7 days.
(2) Unit 3 core alterations may continue for up to 7 days.

B. (1) Unit 2 operation may continue for up to 7 days.
(2) Unit 3 core alterations must be immediately suspended.

C. (1) Unit 2 must be in Mode 3 within 12 hours.
(2) Unit 3 core alterations may continue for up to 7 days.

D. (1) Unit 2 must be in Mode 3 within 12 hours.
(2) Unit 3 core alterations must be immediately suspended.

Answer Key		
Question # 4 SRO		
Choice		Basis or Justification
Correct:	A	Per TS 3.6.4.3 bases, a filter train is part of a SBGT subsystem. For TS 3.6.4.3 Condition A, with one SBGT subsystem inoperable, it must be restored to operable status within 7 days. If not, Unit 2 must be in Mode 3 in 12 hours. For Unit 3, after 7 days either the operable SBGT subsystem must be immediately placed in service or core alterations must be immediately suspended. Therefore, Unit 2 operation may continue for up to 7 days and Unit 3 core alterations may continue for up to 7 days.
Distractors:	B	Unit 3 core alterations may continue for up to 7 days.
	C	Unit 2 operation may continue for up to 7 days.
	D	Unit 2 operation and Unit 3 core alterations may continue for up to 7 days.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(2)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	TS 3.6.4.3 and Bases (pre-AST revision)		
Learning Objective:	PLOT-5009A-8		
K/A System	261000 – Standby Gas Treatment System	Importance:	SRO 4.7
K/A Statement 2.2.40 – Ability to apply Technical Specifications for a system.			
REQUIRED MATERIALS:	**Tech Spec 3.6.4.3 – BOTH Units**		
Notes and Comments:			

5. Unit 2 was operating at 100% power when the following conditions occurred:

- 2A-2C BATTERIES GROUND (220 F-1) is received in the control room
- AO 57B.12-2 "125/250 VDC 2A and C Station Battery Ground Investigation" is in progress.
- The ground detection system (GIS-80896A) indicates a ground value of 13,500 ohms.
- The ground has been isolated to Div. I 250 VDC bus 20D012.

Which one of the following describes (1) what systems/components are impacted by this ground and (2) the correct procedural response to this condition?

A. (1) RCIC DC motor operated valves.
(2) Enter SE-13 "Loss of a 125 or 250 VDC Safety Related Bus."

B. (1) HPCI DC motor operated valves.
(2) Enter SE-13 "Loss of a 125 or 250 VDC Safety Related Bus."

C. (1) RCIC DC motor operated valves.
(2) Continue with ground isolation IAW AO 57B.12-2.

D. (1) HPCI DC motor operated valves.
(2) Continue with ground isolation IAW AO 57B.12-2.

Answer Key		
Question # 5 SRO		
Choice		Basis or Justification
Correct:	C	RCIC DC motor operated valves ARE powered from Div. I 20D012. The correct response is to continue with ground isolation IAW AO 57B.12-2, which directs further actions to isolate the ground (i.e., circuit, load, etc.).
Distractors:	A	RCIC DC motor operated valves ARE powered from Div. I 20D012, but there are no SE-13 entry requirements based on DC system grounds.
	B	HPCI DC motor operated valves are powered from Div. II 250 VDC bus 20D011. In addition, there are no SE-13 entry requirements based on DC system grounds.
	D	HPCI DC motor operated valves are powered from Div. II 250 VDC bus 20D011.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(5)

Source Documentation		
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank
Reference(s):	ARC 220 F-1; AO 57B.12-2; SE-13	
Learning Objective:	PLOT-5057-1d	
K/A System	263000 – D.C. Electrical Distribution	Importance: SRO 3.2
K/A Statement A2.01 – Ability to (a) predict the impact of grounds on D.C. Electrical Distribution and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

6. Unit 2 is in MODE 1 at 100% power.

   - The URO notices the RED light for the 2A Recirc MG Set Drive Motor Breaker is NOT lit.
   - Investigation reveals a failed trip coil in the breaker.

   Refer to Technical Specification 3.3.4.1 PROVIDED SEPARATELY to determine which one of the following is the MOST LIMITING applicable action(s) for these conditions.

   A. Restore ATWS-RPT trip capability within 14 days.

   B. Restore ATWS-RPT trip capability within 72 hours.

   C. Remove the associated recirculation pump from service within 6 hours
      OR
      Be in MODE 2 within 6 hours.

   D. Restore ATWS-RPT trip capability within 1 hour. Otherwise, remove the associated recirculation pump from service within 6 hours
      OR
      Be in MODE 2 within 6 hours.

Answer Key		
Question # 6 SRO		
Choice		Basis or Justification
Correct:	D	The 1 hour completion time is associated with the Required Action of Condition C. Per TS 3.3.4.1 Bases, Condition C applies to multiple, inoperable, un-tripped channels within both Functions not maintaining ATWS-RPT trip capability, as is the case with an inoperable Drive Motor breaker. Condition D applies if the 1-hour completion time of Condition C is not met.
Distractors:	A	Per TS 3.3.4.1 Bases, Condition A does not apply if the inoperable channel is the result of an inoperable breaker. Condition D must be entered and its Required Actions taken.
	B	72 hours is the completion time with only one function of ATWS-RPT trip capability not maintained. With a failed trip coil, the breaker will not automatically trip, which results in both functions of trip capability being lost.
	C	This is the same as choice 'D' except the 1 hour completion time associated with the Required Action of Condition C is not included.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(2)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	Tech Spec 3.3.4.1 and Bases		
Learning Objective:	PLOT-5002-8		
K/A System	202001 – Recirculation	Importance:	SRO 4.6
K/A Statement 2.2.37 – Ability to determine operability and/or availability of safety related equipment.			
REQUIRED MATERIALS:	**Tech Spec 3.3.4.1 – Unit 2**		
Notes and Comments:			

7. Unit 2 Traversing In-Core Probe (TIP) System operation is in progress for an LPRM calibration. A subsequent Feedwater transient results in the following conditions:

   - The Reactor was manually scrammed.
   - RPV level initially lowered to -10 inches but is now steady at +20 inches.
   - The PRO reports the in-service TIP detector is driving into the core and the ball valve RED light is lit.

   Based on the above conditions, (1) assess TIP operation and (2) determine the required action.

   A. (1) RPV level did NOT reach the TIP isolation setpoint.
      (2) Direct the Reactor Engineer to continue the TIP trace IAW RE-35-2 "TIP System Operation."

   B. (1) RPV level has recovered above the TIP isolation setpoint.
      (2) Direct the Reactor Engineer to continue the TIP trace IAW RE-35-2 "TIP System Operation."

   C. (1) The TIP ball valve failed to isolate automatically.
      (2) Direct the PRO to manually withdraw the TIP detector and close the ball valve IAW SO 7F.7-A-2 "TIP System Isolation in Event of Containment Isolation."

   D. (1) The TIP ball valve failed to isolate automatically.
      (2) Direct the PRO to manually fire the shear valve IAW SO 7F.7-A-2 "TIP System Isolation in Event of Containment Isolation."

Answer Key		
Question # 7 SRO		
Choice		Basis or Justification
Correct:	C	The TIP detector should automatically withdraw to shield and the ball valve should automatically close at 1-inch RPV level. For a TIP failure to isolate, GP-8.B directs manual isolation IAW SO 7F.7-2, which directs manually withdrawing the TIP detector to shield and closing the ball valve.
Distractors:	A	The TIP detector should automatically withdraw to shield and the ball valve should automatically close at 1-inch RPV level.
	B	TIP operations would not be allowed to continue following an isolation failure.
	D	The shear valve is only fired if the detector can not be retracted and then only if directed by the Shift Manager.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(5)

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	GP-8.B; SO 7F.7.A-2		
Learning Objective:	PLOT-5007F-6b		
K/A System	215001 – Traversing In-core Probe	Importance:	SRO 3.7
K/A Statement A2.07 – Ability to (a) predict the impact of failure to retract during accident conditions on the TIP System and (b) based on this prediction, use procedures to correct, control, or mitigate the consequences of this abnormal condition or operation.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

8. Unit 2 is operating at 100% power when a pneumatic supply line failure causes outboard MSIV AO-86D to rapidly close.

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

   A. (1) An automatic reactor scram will occur due to a subsequent Group I isolation.
      (2) Enter and execute T-101 "RPV Control."

   B. (1) An automatic reactor scram will occur due to high neutron flux.
      (2) Enter and execute T-101 "RPV Control."

   C. (1) An automatic reactor scram will NOT occur.
      (2) Reduce power IAW GP-5 "Power Operations."

   D. (1) An automatic reactor scram will NOT occur.
      (2) Operation may continue at 100% power IAW GP-5 "Power Operations."

Answer Key		
Question # 8 SRO		
Choice		Basis or Justification
Correct:	B	Per Chapter 14 of the UFSAR (T&A analysis), rapid closure of a single MSIV at 100% power will result in a high neutron flux scram. A concurrent high reactor pressure condition will require entry into T-101.
Distractors:	A	The three un-isolated steam lines will pass 100% steam flow without exceeding the high steam flow isolation setpoint (~140% of rated).
	C	Per GP-5, Table 1, the reactor can operate up to 75% power with 1 MSIV closed. Closure of a single MSIV at 100% power will result in a reactor scram.
	D	Per GP-5, Table 1, the reactor can operate up to 75% power with 1 MSIV closed.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(5)

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	GP-5; UFSAR		
Learning Objective:	PLOT-5001A-6b		
K/A System	239001 – Main and Reheat Steam System	Importance:	SRO 4.2
K/A Statement A2.03 – Ability to (a) predict the impact of MSIV closure on the Main and Reheat Steam System and (b) based on this prediction, use procedures to correct, control, or mitigate the consequences of this abnormal condition or operation.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

9. Unit 2 was operating at 100% power with the OPRM System inoperable when the '2B' Recirc pump tripped. The following conditions currently exist:

- A loop flow (FI-2-2-3-092B) is 45 Mlbm/hr
- B loop flow (FI-2-2-3-092A) is 5 Mlbm/hr
- Indicated Core Flow (FR-2-2-3-095 black pen) is 50 Mlbm/hr
- APRMs are oscillating between 50 and 54% in 4-5 second random intervals

Assess these conditions and identify the correct procedural action.

Refer to AO 60A.1-2 "PBAPS Backup Stability Solution Power Flow Operation Map" PROVIDED SEPARATELY.

The plant is operating in ____(1)____. The required action is to _____(2)_____.

A. (1) Region 1
(2) scram the reactor and enter T-100 "Scram" due to being in Region 1

B. (1) Region 2
(2) insert all GP-9-2 control rods per GP-9-2 "Fast Reactor Power Reduction" due to indications of Thermal Hydraulic Instability

C. (1) Region 2
(2) immediately exit Region 2 by raising '2A' Recirc pump speed using SO 2A.1.D-2 "Operation of the Recirc Pump Speed Control System"

D. (1) the normal operating region
(2) perform the follow-up actions of OT-112 "Unexpected/Unexplained Change in Core Flow"

Answer Key		
Question # 9 SRO		
Choice		Basis or Justification
Correct:	A	The calculation of core flow 50-2(5) = 40 Mlbm/hr / 102.5 Mlbm/hr = 39% (alternatively, 40 Mlbm/hr can be found on the upper 'x' axis). Plotting 40 Mlbm/hr vs. 50-54% power shows the reactor is operating in Region 1. Per AO 60A.1-2, step 4.5, the correct action for operating in Region 1 of the Power Flow Map is to perform an immediate scram.
Distractors:	B	The reactor is operating in Region 1. If a core flow calculation error is made, the candidate could believe the reactor is operating in Region 2. The indications provided do not meet the criteria for THI, but inserting GP-9-2 rods would be a correct action if operating in Region 2. Per AO 60A.1-2, a reactor scram is required anytime THI is occurring while this AO is in effect (i.e., OPRMs inoperable).
	C	The reactor is operating in Region 1. If a core flow calculation error is made, the candidate could believe the reactor is operating in Region 2. Raising recirc pump speed would be a correct action if operating in Region 2 without indications of THI.
	D	If a core flow calculation error is made, the candidate could believe the reactor is operating just inside the normal region.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(5)

Source Documentation		
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank
Reference(s):	OT-112; AO 60A.1-2	
Learning Objective:	PLOT-PBIG-1540-3, -4	
K/A System	295001 – Partial or Complete Loss of Forced Core Flow Circulation	Importance: SRO 3.8
K/A Statement AA2.01 – Knowledge of the operational implications of the following concepts as they apply to Partial or Complete Loss of Forced Core Flow Circulation: Power/Flow Map.		
REQUIRED MATERIALS:	**AO 60A.1-2 "PBAPS Backup Stability Solution Power Flow Operation Map"**	
Notes and Comments:		

10. A fire in the Cable Spreading Room required evacuation of the Main Control Room. The following conditions exist on Unit 2 during implementation of SE-10 "Plant Shutdown From Alternative Shutdown Panels":

- HPCI has been tripped and isolated.
- Alternate shutdown cooling has been established via the 'A' SRV.

(1) Refer to the SE-10 Attachment 11 Cooldown Log below AND the applicable portion of SE-10 Sheet 2 provided on the NEXT PAGE to determine the status of the cooldown rate relative to the SE-10 hourly limit.
(2) Why does SE-10 direct maintaining the 'A' SRV tailpipe temperature above 100 degrees F?

Unit ___2___ SE-10 Attachment 11
Cooldown Log
Date log started ___Today___ Sheet 1

Time	Init.	Rx. Press. (psig)	A SRV tail-pipe temp	Temperature difference from previous 15 min	Difference less than 20 deg-F? (Y/N)
09:00	FB	78	231	\\\\\\\\\\\\\\\\	\\\\\\\\\\\\\\\\
09:15	FB	75	210		
09:30	FB	73	189		
09:45	FB	76	168		
10:00	FB	74	146		

The cooldown rate is ___(1)___ the SE-10 hourly limit.
The 'A' SRV tailpipe temperature must be maintained above 100 degrees F in order to prevent ____(2)____.

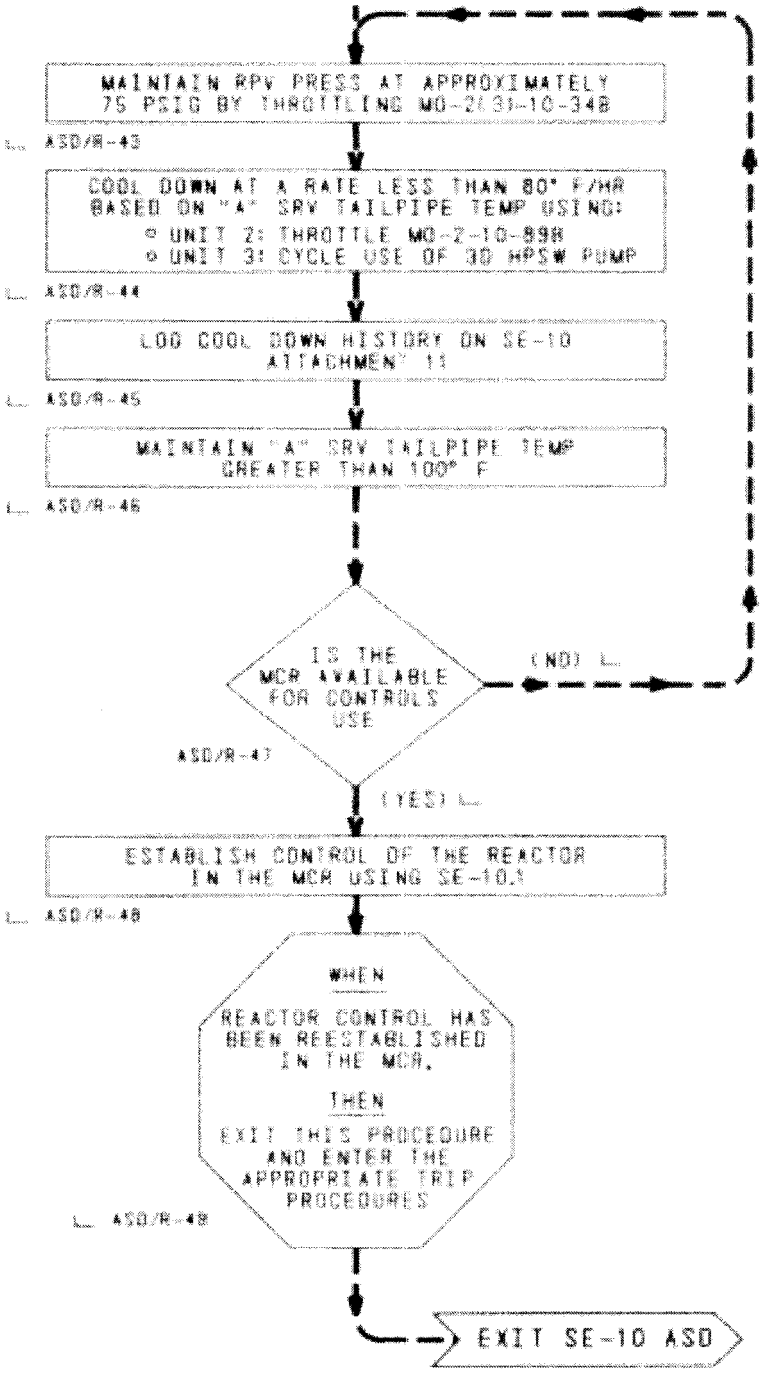
A. (1) above
(2) excessive stress on the SRV tailpipe

B. (1) below
(2) excessive stress on the SRV tailpipe

C. (1) above
(2) exceeding the minimum reactor vessel temperature limits of Tech Spec 3.4.9

D. (1) below
(2) exceeding the minimum reactor vessel temperature limits of Tech Spec 3.4.9

SE-10 Sheet 2


MAINTAIN RPV PRESS AT APPROXIMATELY 75 PSIG BY THROTTLING MO-2(3)-10-34B
ASD/R-43
COOL DOWN AT A RATE LESS THAN 80° F/HR @ASED ON "A" SRV TAILPIPE TEMP USING:
o UNIT 2: THROTTLE MO-2-10-89B
o UNIT 3: CYCLE USE OF 3D HPSW PUMP
ASD/R-44
LOG COOL DOWN HISTORY ON SE-10 ATTACHMENT 11
ASD/R-45
MAINTAIN "A" SRV TAILPIPE TEMP GREATER THAN 100° F
ASD/R-46
IS THE MCR AVAILABLE FOR CONTROLS USE
(NO)
ASD/R-47
(YES)
ESTABLISH CONTROL OF THE REACTOR IN THE MCR USING SE-10.1
ASD/R-48
WHEN
REACTOR CONTROL HAS BEEN REESTABLISHED IN THE MCR,
THEN
EXIT THIS PROCEDURE AND ENTER THE APPROPRIATE TRIP PROCEDURES
ASD/R-49
EXIT SE-10 ASD

Answer Key		
Question # 10 SRO		
Choice		Basis or Justification
Correct:	C	The SE-10 cooldown rate limit is 80 degrees F/hour. The calculated cooldown rate from the Cooldown log is 85 degrees F. Per SE-10 Bases, 'A' SRV tailpipe temperature must be maintained above 100 degrees F to ensure compliance with Tech Spec Figure 3.4.9-2 (Temperature/Pressure Limits for Non-Nuclear Heatup and Cooldown Following a Shutdown).
Distractors:	A	Part 1 is correct; part 2 is incorrect. Per SE-10 Bases, 'A' SRV tailpipe temperature must be maintained above 100 degrees F to ensure compliance with Tech Spec Figure 3.4.9-2.
	B	Both parts are incorrect. The calculated cooldown rate is above the SE-10 limit of 80 degrees F. Per SE-10 Bases, 'A' SRV tailpipe temperature must be maintained above 100 degrees F to ensure compliance with Tech Spec Figure 3.4.9-2.
	D	Part 1 is incorrect; part 2 is correct. The calculated cooldown rate is above the SE-10 limit of 80 degrees F.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(2)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	SE-10 and Bases		
Learning Objective:	PLOT-1555-7, -9		
K/A System	295016 – Control Room Abandonment	Importance:	SRO 3.5
K/A Statement AA2.06 – Ability to determine and/or interpret cooldown rate as it applies to Control Room Abandonment.			
REQUIRED MATERIALS:	**Calculator**		
Notes and Comments:			

11. The Unit 2 RBCCW pumps have been tripped due to a leak in the system. The following conditions currently exist:

- Reactor power has been lowered IAW GP-9-2 "Fast Reactor Power Reduction"
- Initial Recirculation pump '2A' and '2B' parameters on TR-2-2-2-031 are as follows:

Motor bearing temperatures:	
Pt 1 - 185°F	Pt 13 - 189°F
Pt 2 - 174°F	Pt 14 - 182°F
Pt 3 - 190°F	Pt 15 - 187°F
Pt 4 - 186°F	Pt 16 - 185°F
Seal cavity temperatures:	
Pt 8 - 188°F	Pt 20 - 202°F
Pt 9 - 192°F	Pt 21 - 188°F

- Following additional speed reduction IAW GP-9-2, Recirculation pump '2A' and '2B' parameters on TR-2-2-2-031 are as follows:

Motor bearing temperatures:	
Pt 1 - 189°F	Pt 13 - 191°F
Pt 2 - 170°F	Pt 14 - 192°F
Pt 3 - 195°F	Pt 15 - 190°F
Pt 4 - 190°F	Pt 16 - 185°F
Seal cavity temperatures:	
Pt 8 - 178°F	Pt 20 - 182°F
Pt 9 - 172°F	Pt 21 - 178°F

Evaluate these parameters against the portion of ON-113 "Loss of RBCCW" provided on the NEXT PAGE and choose the correct course of action.

A. Perform GP-4 "Manual Reactor Scram", trip both recirculation pumps and enter T-100 "Scram."

B. Trip '2A' recirculation pump ONLY. Enter OT-112 "Unexpected/Unexplained Change in Core Flow" and execute concurrently with ON-113.

C. Continue to reduce '2B' recirculation pump speed ONLY, using SO 2A.1.D-2 "Operation of the Recirc Pump Speed Control System."

D. Trip '2A' recirculation pump AND continue to reduce '2B' recirculation pump speed. Enter OT-112 "Unexpected/Unexplained Change in Core Flow" and execute concurrently with ON-113.

2.6 IF at any time it is necessary to shutdown BOTH Recirc Pumps OR IF at any time the second Recirc Pump is required to be shutdown, THEN **PERFORM** the following:

2.6.1 **PERFORM** GP-4, "Manual Reactor Scram" AND **ENTER** T-100, "Scram", AND **EXECUTE** concurrently with this procedure.

2.6.2 **TRIP** the running Recirc Pumps.

2.7 **MONITOR** the following Recirc Pump motor bearing temperatures on TR-2(3)-02-2-031 on Panel 2(3)0C021:

RECIRC PUMP "A": Points 1 thru 4

RECIRC PUMP "B": Points 13 thru 16

2.7.1 IF any Recirc Pump motor bearing temperature exceeds 194°F, THEN **TRIP** the affected Recirc Pump AND **ENTER** OT-112 AND **EXECUTE** concurrently with this procedure.

2.8 **MONITOR** the following Recirc Pump seal temperatures on TR-2(3)-02-2-031 on Panel 2(3)0C021:

RECIRC PUMP "A": Points 8 and 9

RECIRC PUMP "B": Points 20 and 21

2.8.1 IF any Recirc Pump seal temperature is greater than OR equal to 180°F, THEN **REDUCE** the affected Recirc Pump speed in 25 - 50 rpm decrements until the seal temperature is restored AND maintained less than 180°F.

2.8.2 IF any Recirc Pump seal temperature is greater than OR equal to 200°F, THEN perform the following:

1. Per GP-9-2(3), **REDUCE** the speed of BOTH Recirc Pumps to the flow value specified in GP-9-2(3).

2. IF the speed reduction does NOT restore AND maintain seal temperature below 180°F, THEN **REMOVE** the affected Recirc Pump from service following the guidance in GP-5 for entering Single Loop Operation.

Answer Key		
Question # 11 SRO		
Choice		Basis or Justification
Correct:	A	Following recirc pump speed reduction IAW GP-9-2, one motor bearing temperature on the 2A pump is >194 degrees F, which requires tripping the 2A pump. In addition, the 2B pump seal temperature is above 180 degrees F. Since both pumps have a temperature point above the level for removing the pump from service, a GP-4 scram is required, followed by tripping both pumps and entering T-100 per step 2.6 of ON-113.
Distractors:	B	ON-113 gives direction to remove the 2B pump from service (single loop) based on seal temperature. However, since the 2A pump must be tripped due to high motor bearing temperature, both pumps must be removed from service, which first requires a reactor scram.
	C	The 2A pump must be tripped based on motor bearing temperatures.
	D	Based on the conditions given, GP-9-2 is already in progress and recirc pump speed has already been lowered. Based on the direction in ON-113, the 2B recirc pump must be removed from service.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(5)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ON-113 and Bases		
Learning Objective:	PLOT-PBIG-1550-3, -18a, -18b		
K/A System	295018 – Partial or Complete Loss of Component Cooling Water	Importance:	SRO 3.4
K/A Statement AA2.01 – Ability to determine and/or interpret component temperatures as they apply to Partial or Complete Loss of Component Cooling Water.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

12. An ATWS is in progress on Unit 2.

RPV water level was intentionally lowered per T-117 "Level/Power Control."

The following conditions currently exist:

- Reactor power is 6%
- 1 SRV is stuck open
- RPV level is -200 inches and rising
- EHC is controlling RPV pressure at 950 psig
- Torus temperature is 175 degrees F and rising
- RHR loop 'A' is in Torus cooling; 'B' loop is unavailable
- Torus pressure is 6 psig and slowly rising
- Torus level is 15 feet and stable
- HPCI is injecting at 5000 gpm

Which one of the following describes the required action and the reason for taking the action?

Refer to the portions of T-102 "Primary Containment Control" AND T-117 "Level/Power Control" provided on the NEXT TWO PAGES.

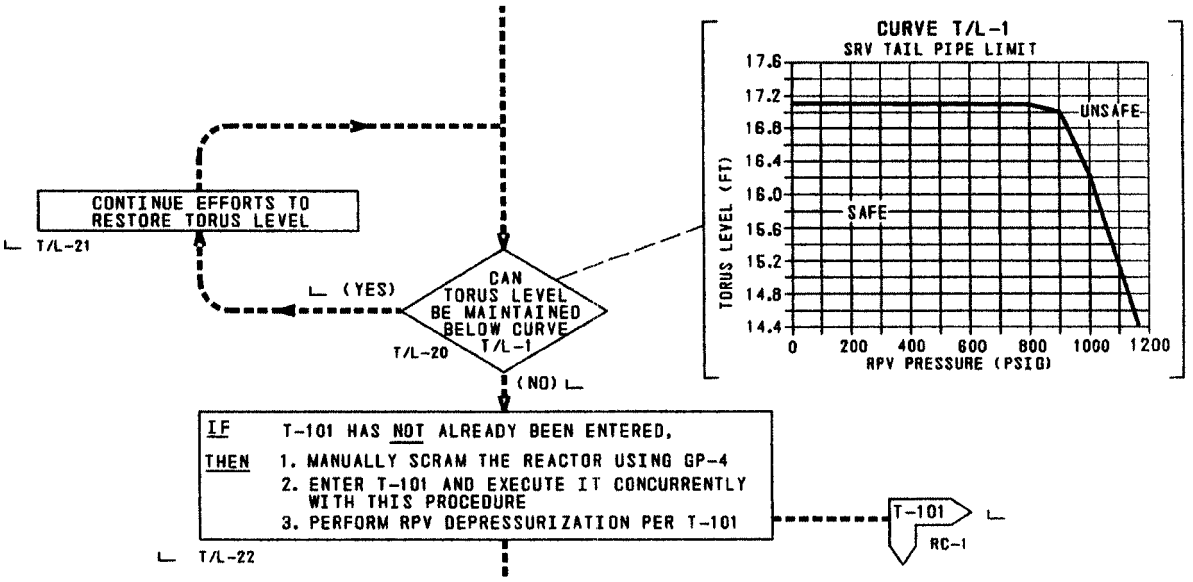
A. Reduce RPV pressure to less than 900 psig in order to maintain on the safe side of T/L-1 "SRV Tail Pipe Limit."

B. Perform Emergency Blowdown per T-112 due to inability to maintain RPV level above -195 inches.

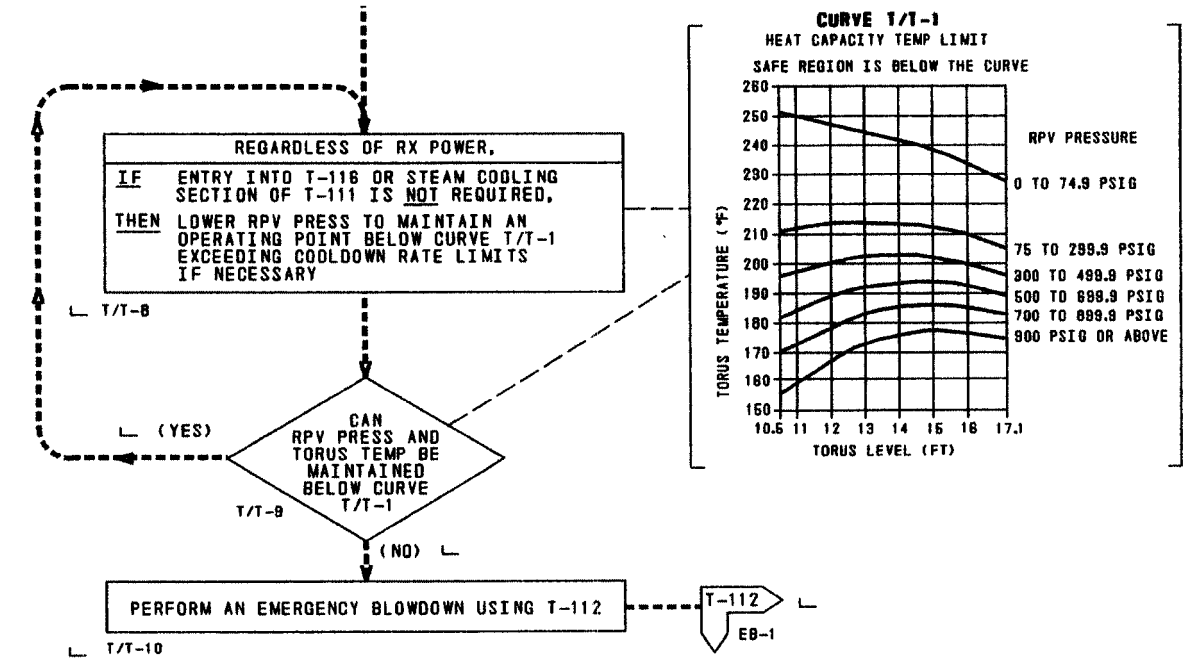
C. Reduce RPV pressure to less than 900 psig in order to maintain on the safe side of T/T-1 "Heat Capacity Temperature Limit."

D. Perform Emergency Blowdown per T-112 due to being on the unsafe side of T/T-1 "Heat Capacity Temperature Limit."

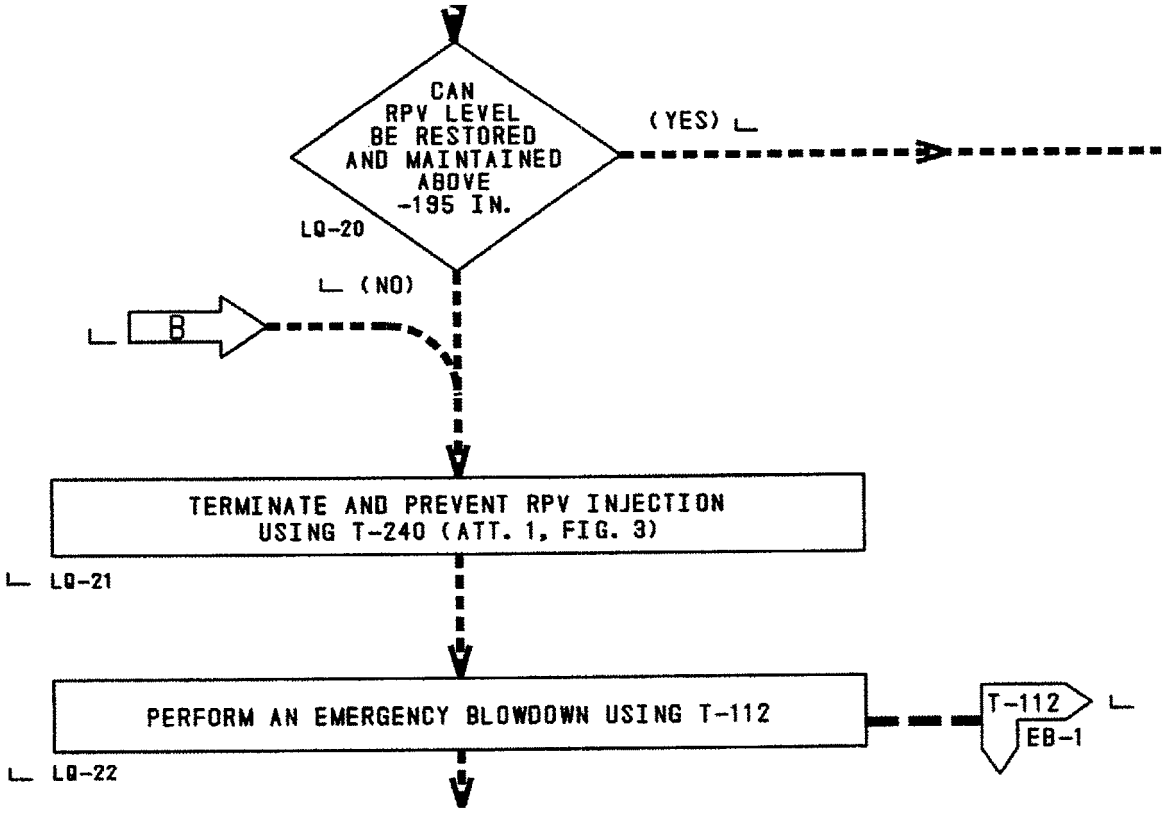
T-102 "Primary Containment Control"
"SRV Tail Pipe Limit" Curve



T-102 "Primary Containment Control"
"Heat Capacity Temperature Limit" Curve



T-117 "Level/Power Control"



Answer Key		
Question # 12 SRO		
Choice		Basis or Justification
Correct:	C	Torus temperature is ~3 degrees F from HCTL and rising. If Torus temperature cannot be maintained on the safe side of HCTL, T-102 T/T-8 directs maintaining RPV pressure on the safe side of HCTL.
Distractors:	A	Torus level is high but 1.6 feet away from T/L-1 limit and level is stable. Reducing pressure for the purposes of maintaining this curve is not warranted.
	B	While RPV Level is below -195 inches, it is only 5 inches below band and is rising due to HPCI injection. The criterion for T-117 LQ-20 is whether or not level can be restored and maintained above -195 inches, which it can. Therefore, T-112 is not warranted under these conditions.
	D	Operation is on the SAFE side of the HCTL curve.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(5)

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☐ ILT Exam Bank	☒ Previous NRC Exam (LGS – 2006) ☐ Other Exam Bank	
Reference(s):	T-102 and Bases		
Learning Objective:	PLOT-PBIG-2102-5a		
K/A System	295026 – Suppression Pool High Water Temperature	Importance:	SRO 4.2
K/A Statement EA2.01 – Ability to determine and/or interpret the following as it applies to Suppression Pool high water temperature: Suppression Pool water temperature.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

13. Unit 2 was operating at full power when a small break Loss of Coolant Accident (LOCA) occurred. The following conditions currently exist:

- Torus level is 17 feet and rising.
- Torus pressure is 9.8 psig and rising.
- Drywell temperature indicated 165 degrees F before TI-80146 "Drywell Bulk Average Temperature Indicator" failed.
- Based on T-102 "Primary Containment Control" NOTE #27 below, the crew attempted to perform a manual calculation of Drywell Bulk Average Temperature using RT-O-40C-530-2 "Drywell Temperature Monitoring" but the calculation was invalid.

(#27) IF TI-80146(90146) IS OUT OF SERVICE, THEN USE RT-O-40C-530 TO DETERMINE DW BULK AVG TEMP

Evaluate these conditions to determine the appropriate action related to spraying the Drywell.

A. Do NOT spray the Drywell since the safe side of the DWSIL curve cannot be verified per RT-O-40C-530-2.

B. Do NOT spray the Drywell since Torus level may rise above the limit of T-102 "Primary Containment Control" for spraying the Drywell.

C. Spray the Drywell per T-102 after verifying the safe side of the DWSIL curve using TI-2501, Point 136 plus 10 degrees F.

D. Spray the Drywell per T-102 after verifying the safe side of the DWSIL Curve using the hottest temperature indicated on TI-2501, Points 119-127.

Answer Key		
Question # 13 SRO		
Choice		Basis or Justification
Correct:	A	RT-O-40C-530-2 precaution 4.2.2 states that if the calculation of Drywell Bulk Average Temperature is invalid, the safe side of the DWSIL curve cannot be verified. DO NOT SPRAY THE DRYWELL.
Distractors:	B	Per T-102, the Torus level limit for spraying the Drywell is 18 feet. If Drywell sprays are required and all other conditions are met, Torus level at 17 feet and rising would not prevent spraying the Drywell.
	C	TI-2501, Point 136 (plus 10 degrees F) can be used to calculate approximate drywell temperature for entering ON-120 or T-102, but not for spraying the drywell.
	D	Using the hottest temperature from TI-2501 points 119-127 is an acceptable method of determining when to initiate RPV blowdown, but it is not acceptable for use on the DWSIL curve.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(5)

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	T-102 (Note #27); RT-O-40C-530-2		
Learning Objective:	PLOT-1560-11		
K/A System	295028 – High Drywell Temperature	Importance:	SRO 4.3
K/A Statement 2.4.20 – Knowledge of the operational implications of EOP warnings, cautions and notes.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

14. Unit 2 was operating at 100% power when a Group I Isolation occurred. The following conditions currently exist:

- Reactor power is 18%
- RPV pressure is 1100 psig
- Instrument Nitrogen has NOT been restored
- Torus water level is 13.5 feet and lowering
- Torus temperature is 170 degrees F and steady

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

Refer to the portions of T-101 "RPV Control" AND T-102 "Primary Containment Control" provided on the NEXT THREE PAGES.

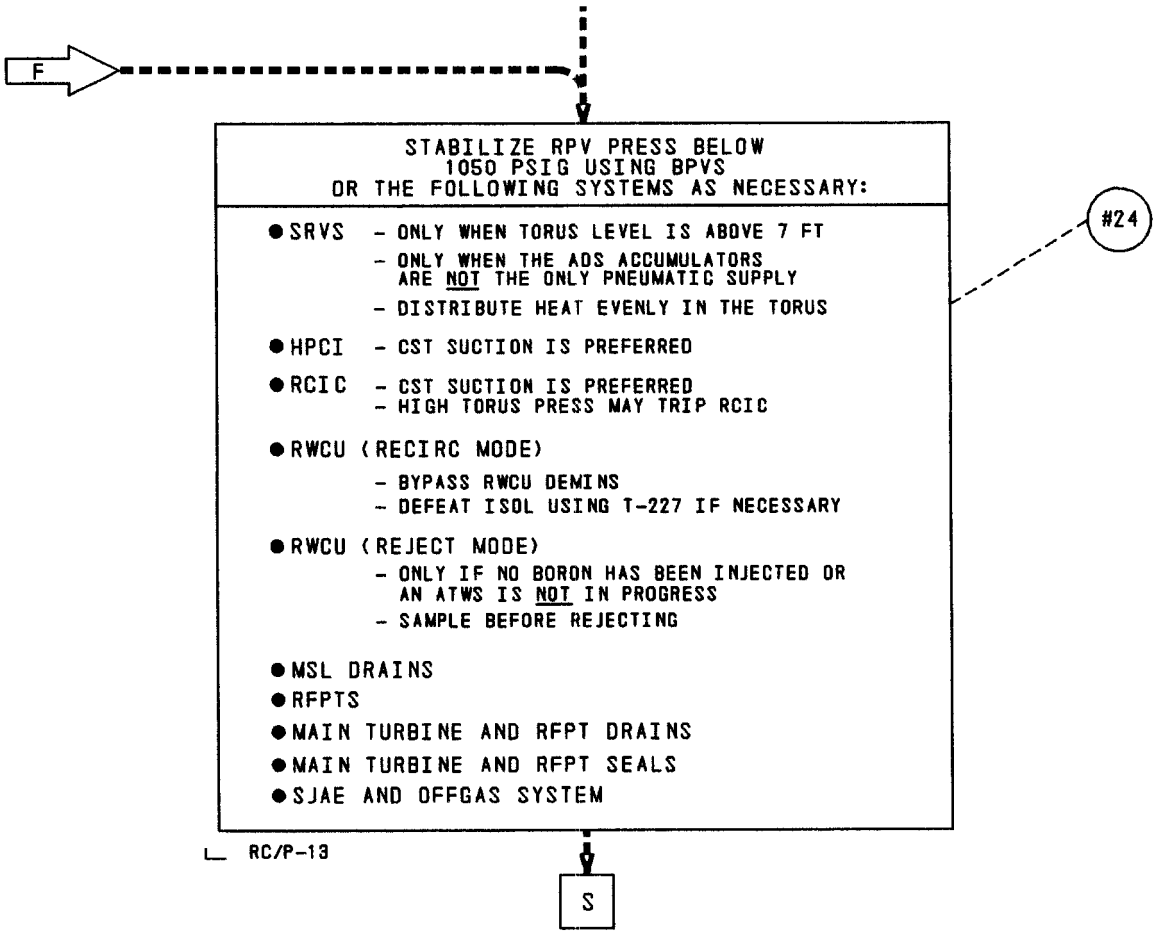
A. Use the Bypass Jack to lower RPV pressure IAW T-101 "RPV Control."

B. Use manual SRV operation to lower RPV pressure IAW T-101 "RPV Control."

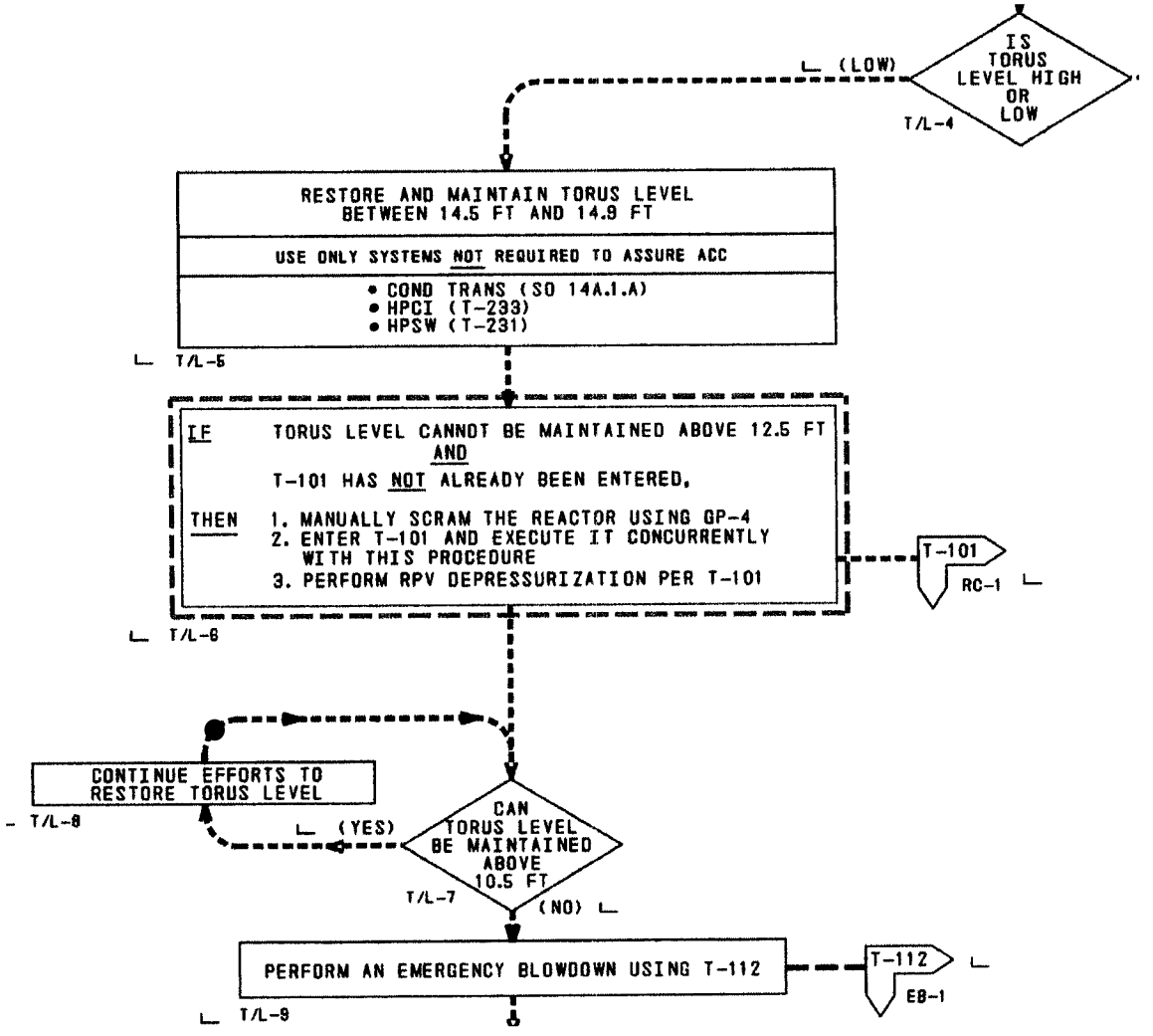
C. Perform T-112 "Emergency Blowdown" BEFORE Torus level drops below 10.5 feet.

D. Perform T-112 "Emergency Blowdown" BEFORE Torus level drops below 12.5 feet.

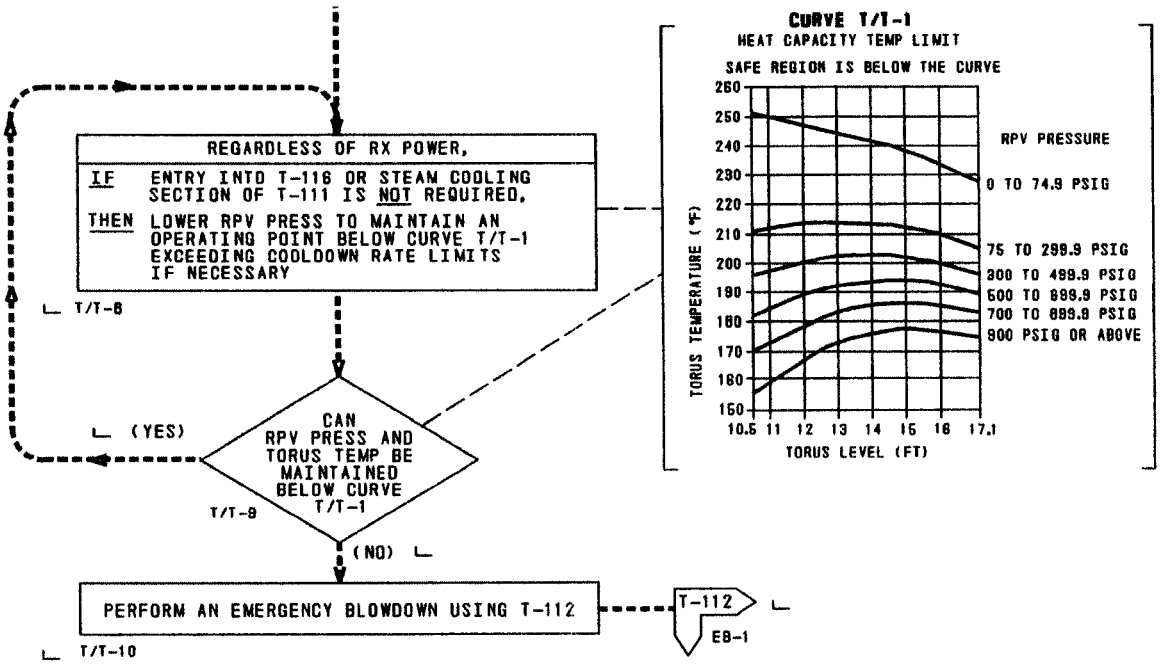
T-101 "RPV Control"



T-102 "Primary Containment Control"



T-102 "Primary Containment Control"



Answer Key		
Question # 14 SRO		
Choice		Basis or Justification
Correct:	D	At a Torus level of 12.5 feet, for 170 degrees F Torus temperature, HCTL would be exceeded. An emergency blowdown is required then by T-102, step T/T-9 and T/T-10.
Distractors:	A	Although lowering RPV pressure is directed by T-102, step T/T-6, bypass valves are not available due to the Group I isolation.
	B	Although lowering RPV pressure is directed by T-102, step T/T-6, SRVs are not available without Instrument N2 (accumulators are reserved for ADS). T-101, step RC/P-13, directs use of SRVs ONLY when the accumulators are NOT the only source of pneumatic supply.
	C	This choice looks attractive since this is when T-102, steps T/L-7 & 8 direct a blowdown based on Torus level. However, based on the HCTL curve, a blowdown would be required before Torus level drops below 12.5.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(5)

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	T-101 and Bases; T-102 and Bases		
Learning Objective:	PLOT-1560-3		
K/A System	295030 – Low Suppression Pool Water Level	Importance:	SRO 4.2
K/A Statement G2.4.47 – Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

15. Unit 2 was operating at 100% power when a Reactor Scram was attempted due to Main Turbine vibration. The following conditions exist:

- Main Turbine is tripped
- An ATWS is in progress
- RPV level is steady at -150 inches and is being controlled in accordance with T-240-2 "Termination and Prevention of Injection into the RPV"
- RPV pressure is being controlled with Bypass Valves and SRV's within a band of 950-1050 psig
- Reactor Building Steam Tunnel temperatures are 173 degrees F and rising
- T-221 "MSIV Bypass" is in progress

For the above conditions, which one of the following must be performed?

A. GP-8.B "PCIS Isolation - Groups II and III" to reset isolations.

B. T-227-2 "Defeating RWCU Isolation Interlock" to restore RWCU.

C. T-222-2 "Secondary Containment Ventilation Bypass" to restore Reactor Building ventilation.

D. AO 40B.1-2 "Raising MSL Tunnel PCIS Group I Hi Temp Trip Setpoint" to prevent a Group I isolation on high steam tunnel temperature.

Answer Key		
Question # 15 SRO		
Choice		Basis or Justification
Correct:	C	T-221-2 directs the operator to perform T-222-2 to prevent isolation of the MSIVs due to high steam tunnel temperature that could occur without normal Secondary Containment ventilation.
Distractors:	A	GP-8.B cannot be used to reset the isolations with RPV level < 1 inch.
	B	T-227-2 is for pressure control; it is not required for the given conditions.
	D	Although performing this AO would bypass a PCIS Group I isolation, it is not required for the given conditions.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(5)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	T-117; T-221-2; T-222-2		
Learning Objective:	PLOT-1560-13		
K/A System	295037 – Scram Condition Present and Reactor Power Above APRM Downscale	Importance:	SRO 4.2
K/A Statement EA2.07 – Ability to determine and/or interpret the following as it relates to Scram Condition Present and Reactor Power Above APRM Downscale: Containment conditions/isolations.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

16. Given the following conditions:

- Unit 2 was initially operating at 100% power.
- An EHC System malfunction resulted in a reactor pressure transient.
- Reactor pressure peaked at 1340 psig.

In accordance with Technical Specifications, a Safety Limit Violation ___(1)___.

Referring to LS-AA-1020 "Reportability Reference Manual, Volume 1 – Table SAF" PROVIDED SEPARATELY, the NRC _____(2)_____.

A. (1) has occurred
   (2) must be notified within one hour

B. (1) has occurred
   (2) must be notified within four hours

C. (1) has NOT occurred
   (2) does NOT need to be notified

D. (1) has NOT occurred
   (2) should receive a courtesy notification call within four hours

Answer Key		
Question # 16 SRO		
Choice		Basis or Justification
Correct:	B	Safety Limit 2.1.2, Reactor Steam Dome pressure has been exceeded (1325 psig). This requires notification to the NRC WITHIN four (4) hours per LS-AA-1020 Exelon Reportability Reference Manual, SAF 1.16.
Distractors:	A	Wrong notification time. This requires notification to the NRC WITHIN four (4) hours per LS-AA-1020 Exelon Reportability Reference Manual, SAF 1.16.
	C	A Safety Limit has been violated.
	D	A Safety Limit has been violated.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(2)

Source Documentation		
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank
Reference(s):	Tech Spec 2.1.2; LS-AA-1020, SAF 1.16	
Learning Objective:	PLOT-1800-9	
K/A System	295007 – High Reactor Pressure	Importance: SRO 4.1
K/A Statement G2.4.30 – Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as State, the NRC, or the transmission system operator.		
REQUIRED MATERIALS:	**LS-AA-1020 "Reportability Reference Manual, Volume 1 – Table SAF"**	
Notes and Comments:		

17. Unit 3 is operating at 100% power when the following occurs:

- Annunciator 317 K-5, REAC BLDG HI-LO DIFF PRESSURE, alarms.
- Annunciator 317 L-1, REAC BLDG REFUELING AREA HI-LO DIFF PRESS, alarms.
- Reactor Building dP indicates +1 inch and rising on DPI-30003-1.
- An Equipment Operator reports a steam leak in the area of the Unit 3 HPCI Room.
- Attempts to isolate the HPCI steam supply line have failed.
- HPCI Room area temperature is 132 degrees F and rising on TR-3-13-139 Point #3.
- RCIC Room area temperature is 112 degrees F and rising on TR-3-13-139 Point #2.

Based on these conditions, T-103 entry is required due to the potential for an unmonitored radiation release via the _____(1)_____ and the CRS must direct _____(2)_____.

Refer to the portions of T-103 "Secondary Containment Control" provided on the NEXT TWO PAGES.

A. (1) Vent Stack
(2) plant shutdown using GP-3 "Normal Plant Shutdown"

B. (1) Vent Stack
(2) GP-4 "Manual Reactor Scram" AND depressurize per T-101 "RPV Control"

C. (1) Refuel Floor blowout panels
(2) plant shutdown using GP-3 "Normal Plant Shutdown"

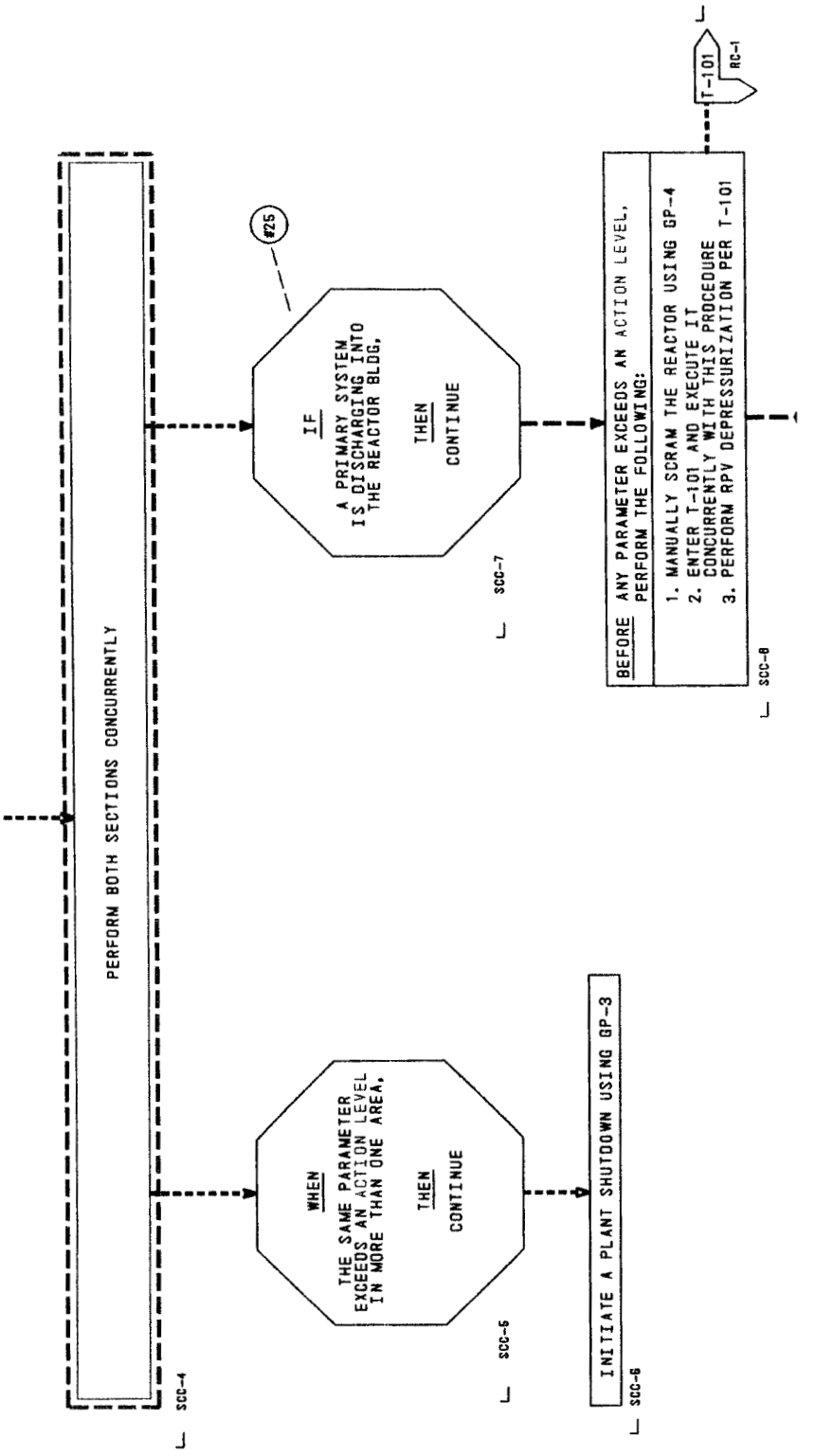
D. (1) Refuel Floor blowout panels
(2) GP-4 "Manual Reactor Scram" AND depressurize per T-101 "RPV Control"

T-103 "Secondary Containment Control"

TABLE SC/T-3
TEMPERATURE-ALARM AND ACTION LEVELS

AREA	ALARM LEVEL (°F)	ACTION LEVEL (°F)	INSTRUMENT TRS-2(3)-13-139 PT # (UNLESS SPECIFIED OTHERWISE)	STATUS
TORUS ROOM	115	135	PT 8,9,14,15,20, OR 24	
RCIC ROOM OR HPCI ROOM	110 110	135 150	PT 2 PT 3	
A RHR ROOM OR C RHR ROOM	110 110	135 135	PT 17 PT 29	
B RHR ROOM OR D RHR ROOM	110 110	135 135	PT 23 PT 6	
A CS ROOM OR C CS ROOM	110 110	135 135	TI-2(3)501 PT 151 TI-2(3)501 PT 152	
B CS ROOM OR D CS ROOM	110 110	135 135	TI-2(3)501 PT 153 TI-2(3)501 PT 154	
STEAM TUNNEL	175	UNIT 2: 230 / UNIT 3: 190	PT 1 OR 16	
A ISOL VALVE ROOM (SOUTH)	165	190	PT 12	
B ISOL VALVE ROOM (NORTH)	165	190	PT 18 OR 21	
ISOL VALVE PIT 165' EL	140	150	PT 30	
RWCU REGEN HX ROOM OR A NON REGEN HX ROOM OR B NON REGEN HX ROOM OR A OR B RWCU FLTR DEMIN ROOM OR RWCU BACKWASH VALVE ROOM	160 130 130 115 105	NO ACTION LEVEL	PT 11 PT 28 PT 5 PT 10 OR 27 PT 4	
GENERAL AREA 165' EL (MAY AFFECT RPV LEVEL INST)	105	135	PT 22	

T-103 "Secondary Containment Control"



Answer Key		
Question # 17 SRO		
Choice		Basis or Justification
Correct:	D	T-103 bases states that if ARC-317 K-5 is received, action must be taken to prevent a possible breach of Secondary Containment via the Refuel Floor blowout panels. The panels blowout at +7 inches of water (+.25 psig). T-103 step SCC-8 requires a reactor scram and depressurization since a primary system is discharging into the Reactor Building.
Distractors:	A	The Reactor Building would isolate if exhaust radiation reached the isolation set point, preventing release via the Vent Stack. Also, GP-3 shutdown is directed by T-103 only when there is no primary system discharging into the Reactor Building and when the same parameter exceeds an action level in more than one area. ONLY the HPCI Room is affected.
	B	The Reactor Building would isolate if exhaust radiation reached the isolation set point, preventing release via the Vent Stack.
	C	GP-3 shutdown is directed by T-103 only when there is no primary system discharging into the Reactor Building and when the same parameter exceeds an action level in more than one area. ONLY the HPCI Room is affected.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(5)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ARC-317 K-5; T-103 and Bases		
Learning Objective:	PLOT-2103-1		
K/A System	295035 – Secondary Containment High Differential Pressure	Importance:	SRO 3.9
K/A Statement EA2.01 – Ability to determine and/or interpret Secondary Containment pressure as it applies to Secondary Containment High Differential Pressure.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

18. Given the following conditions:

- Unit 2 was initially operating at 100% power.
- T-101 "RPV Control" and T-102 "Primary Containment Control" have been entered due to a Loss of Coolant Accident.
- RPV level has been recovered to -165 inches and is steady.
- Twenty minutes after the PRO placed the "A CAC/CAD Analyzer" AND the "B CAC/CAD Analyzer" in service, he reports the following readings on both analyzers:

    - Drywell H2 concentration is 0.6%
    - Drywell O2 concentration is 0.6%
    - Torus H2 concentration is 0.4%
    - Torus O2 concentration is 3.5%

Pending determination of off-site release rates, what actions, if any, are required for these conditions?

Refer to T-102 "Primary Containment Control" Sheet 2 PROVIDED SEPARATELY.

A. Vent the Torus per step T/G-1.4 ONLY.

B. Vent the Drywell per step DW/G-1.4 ONLY.

C. Vent the Torus per step T/G-1.4 AND the Drywell per step DW/G-1.4.

D. Torus venting is NOT required; Drywell venting is NOT required.

Answer Key		
Question # 18 SRO		
Choice		Basis or Justification
Correct:	B	Drywell venting using the 2" vents is required per T-102, Sheet 2, step DW/G-1.4.
Distractors:	A	Drywell (not Torus) venting is required per T-102, Sheet 2, step DW/G-1.4.
	C	Drywell venting is required ONLY per T-102, Sheet 2, step DW/G-1.4 using a 2 inch vent line only.
	D	Drywell venting is required per T-102, Sheet 2, step DW/G-1.4.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(5)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	RRC 7J.1-2; SO 7J.1.B-2		
Learning Objective:	PLOT-1560-3		
K/A System	500000 – High Containment Hydrogen Concentration	Importance:	SRO 4.7
K/A Statement G2.4.6 – Knowledge of EOP mitigation strategies			
REQUIRED MATERIALS:	**T-102 "Primary Containment Control" SHEET 2 of 3**		
Notes and Comments:			

19. The following conditions exist on Unit 3:

- Fuel reload is in progress in the "B" core quadrant
- The fuel being loaded is NOT directly adjacent to any WRNM
- A fuel assembly has just been seated and the grapple is still engaged
- The Reactor Operator recorded the following data for this step:

	BEFORE	AFTER
"A" WRNM	20 cps	20 cps and steady
"B" WRNM	30 cps	150 cps and steady

What action is required by ON-124 "Fuel Floor and Fuel Handling Problems" for these conditions?

A. Immediately evacuate the Refuel Floor area.

B. Continue fuel moves and notify Reactor Engineering.

C. Raise the grappled fuel assembly above the upper grid.

D. Immediately suspend fuel moves and determine operability of "B" WRNM.

Answer Key		
Question # 19 SRO		
Choice		Basis or Justification
Correct:	C	"B" WRNM has gone from 30 cps to 150 cps, which is >2 doublings. ON-124 requires raising the fuel assembly from the core so that it clears the upper grid if the bundle is still grappled, which it is in this case.
Distractors:	A	Per ON-124, this is required IF count rate continues to rise after the fuel assembly is raised from the core.
	B	Per ON-124, if WRNM count rate doubles 2 times between CCTAS steps, the first action is to raise the fuel assembly from the core so that it clears the upper grid. Then fuel handling operations would be SUSPENDED, and the appropriate notifications would be made (including Reactor Engineering).
	D	Based on the given conditions, the first action is to raise the fuel assembly from the core, THEN suspend fuel moves.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(6)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ON-124		
Learning Objective:	PLOT-PBIG-1550-3, -27a		
K/A System	N/A	Importance:	SRO 4.6
K/A Statement G2.1.37 – Knowledge of procedures, guidelines, or limitations associated with reactivity management.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

20. A small steam leak inside the Drywell occurred on Unit 2.

The reactor was depressurized in accordance with T-112 "Emergency Blowdown" due to being unable to restore and maintain drywell temperature below 281 degrees F.

The following conditions existed at the start of the blowdown:

- Indicated RPV level was -140 inches
- All high-pressure feed sources were unavailable

The following conditions exist at the completion of the blowdown:

- RPV pressure is 35 psig
- Indicated Wide Range level is -110 inches
- All other RPV level indications are upscale
- Drywell temperature (TI-2501 points 126 and 127) is 295 degrees F
- Multiple failures prevented LPCI and Core Spray systems from injecting

What action is required for these conditions?

Refer to the portions of T-102 "Primary Containment Control" AND T-112 "Emergency Blowdown" provided on the NEXT TWO PAGES.

A. Enter T-116 "RPV Flooding."

B. Enter T-111 "Level Restoration."

C. Establish Shutdown Cooling per T-112 "Emergency Blowdown."

D. Restore RPV level to between +5 and +35 inches per T-101 "RPV Control."

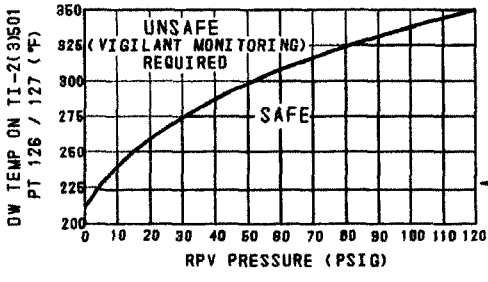
T-102 "Primary Containment Control"

TABLE DW/T-1
RPV LEVEL INSTRUMENT STATUS

AN RPV LEVEL INSTRUMENT MAY BE USED TO DETERMINE RPV LEVEL ONLY WHEN THE FOLLOWING CONDITIONS ARE SATISFIED:

NOTE: USE AVAILABLE POINTS (126 / 127 OF TI-2(3)501) TO DETERMINE RPV LEVEL INSTRUMENT STATUS

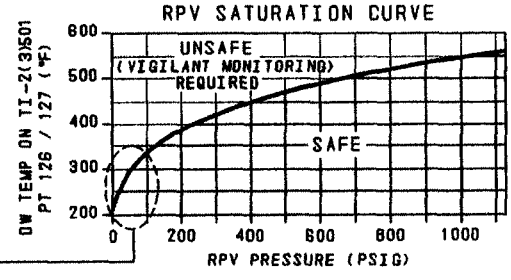
RPV SATURATION CURVE



SEE DETAIL

ALL RPV LEVEL INSTRUMENTS

RPV SATURATION CURVE



IF DW TEMP AND RPV PRESS ARE ON THE UNSAFE SIDE OF THE RPV SATURATION CURVE
AND AN INSTRUMENT EXHIBITS AN UNEXPLAINED TREND OR OSCILLATION,
THEN THAT INSTRUMENT IS UNAVAILABLE

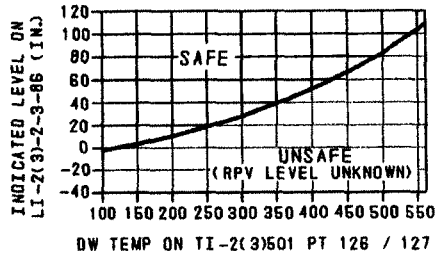
WIDE AND NARROW RANGE INSTS ONLY

FOR EACH OF THE INSTRUMENTS IN THE TABLE, THE INSTRUMENT READS ABOVE THE MIN INDICATED LEVEL OR THE TEMP NEAR THE DW REFERENCE LEG VERTICAL RUNS (TI-2(3)501 PT 126 / 127) ARE BELOW THE MAX RUN TEMP.

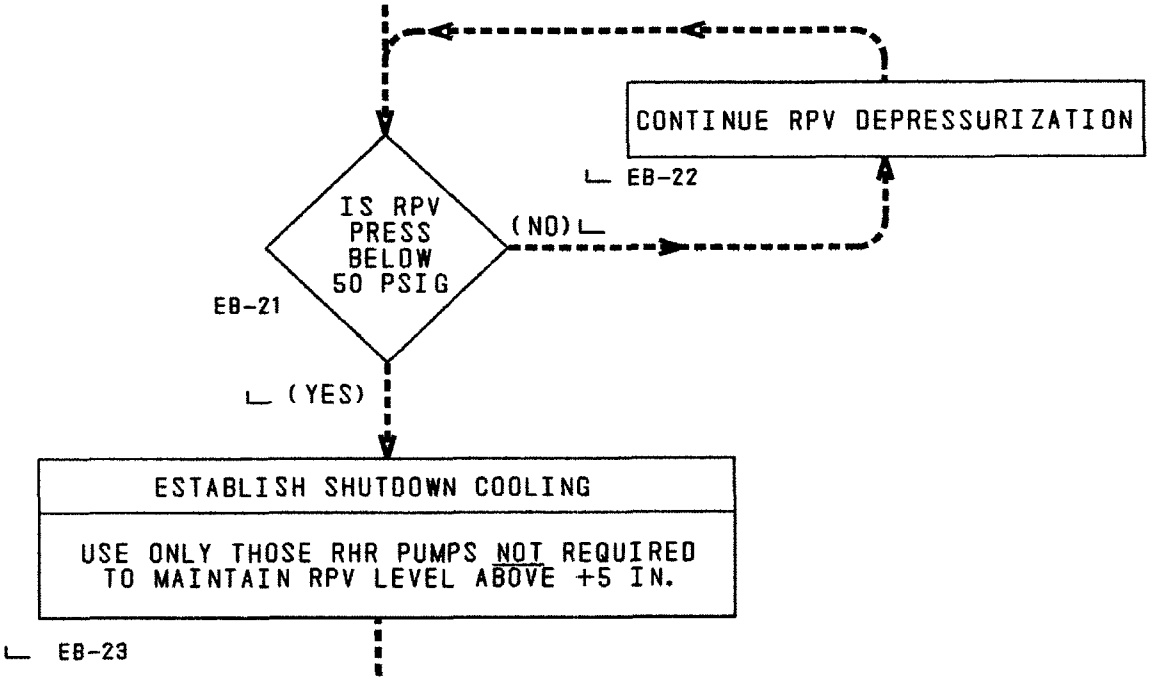
INSTRUMENT	MIN INDICATED LEVEL IS ABOVE	OR	MAX RUN TEMP IS BELOW
NARROW RANGE	10 IN.	OR	450°F
WIDE RANGE	-120 IN.	OR	500°F

SHUTDOWN RANGE INST LI-2(3)-2-3-86 ONLY

LI-2(3)-2-3-86 READS ON THE SAFE SIDE OF THE CURVE



T-112 "Emergency Blowdown"



Answer Key		
Question # 20 SRO		
Choice		Basis or Justification
Correct:	A	Per T-102, Table DW/T-1, wide range level plots on the UNSAFE side of the RPV saturation curve. Since it plots UNSAFE and exhibits an unexplained trend (level increase from -140 inches to -110 inches after completion of the blowdown without any makeup sources), wide range level is unavailable. Since all other level indication is upscale (unavailable), level is unknown and entry into T-116 is directed by T-112 step EB-2 (T-101 RC/L-1, T-111, etc.).
Distractors:	B	Level cannot be determined. In addition, T-111 is not entered unless RPV level cannot be maintained above -172 inches.
	C	Level cannot be determined.
	D	Level cannot be determined.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(5)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	T-101; T-102; T-112; T-116		
Learning Objective:	PLOT-1560-11		
K/A System	N/A	Importance:	SRO 4.3
K/A Statement 2.1.45 – Ability to identify and interpret diverse indications to validate the response of another indicator.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

21. Given the following:

- Unit 2 is operating at 90% power following intermittent and spurious changes in #3 Turbine Control Valve (TCV) position.
- To support troubleshooting, I&C requested to perform "power noise monitoring" in EHC Cabinet 20C30.
- The work order specifies hooking up a strip chart recorder at new monitoring points recommended by the vendor.
- The System Manager has determined that these are NOT approved test points on the cards.

Refer to Attachment 4 "Risk and Rigor Determination Matrix" of MA-AA-716-004 "Conduct of Troubleshooting" PROVIDED SEPARATELY to classify this activity.

This is a ___(1)___ Risk troubleshooting activity, classified as Category __(2)__.

A. (1) High
(2) A

B. (1) High
(2) C

C. (1) Medium
(2) A

D. (1) Medium
(2) C

Answer Key		
Question # 21 SRO		
Choice		Basis or Justification
Correct:	A	Per Guideline 1.3 of Attachment 4, Risk and Rigor Determination Matrix, EHC is High Risk, and activity is Diagnostic hookup for monitoring on equipment in service without test points – Category A.
Distractors:	B	EHC is High Risk but activity without test points is Category A; activity with test points is Category C.
	C	EHC is High Risk and activity is Category A.
	D	EHC is High Risk and activity is Category A.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(5)

Source Documentation		
Source:	☐ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☒ Other Exam Bank – LORT
Reference(s):	MA-AA-716-004, Attachment 4, "Risk and Rigor Determination Matrix"	
Learning Objective:	PLOT-DBIG-1570-6	
K/A System	N/A	Importance: SRO 3.8
K/A Statement G2.2.20 – Knowledge of the process for managing troubleshooting activities.		
REQUIRED MATERIALS:	**MA-AA-716-004, Attachment 4, "Risk and Rigor Determination Matrix"**	
Notes and Comments:		

22. Equipment Operators need to enter a locked high radiation area to manually operate Primary Containment Isolation Valves in order to satisfy a Technical Specification required action. The highest dose rate in the area is 16,000 mR/hr (16 R/hr).

Per RP-PB-460-1001 "Radiation Protection Controlled Keys", which one of the following describes the type of Locked High Radiation Area and the highest level of authorization required for issuing the key?

	Type of LHRA	Highest Authorization Required
A.	Level 1	Radiation Protection Manager
B.	Level 1	Plant Manager
C.	Level 2	Radiation Protection Manager
D.	Level 2	Plant Manager

Answer Key		
Question # 22 SRO		
Choice		Basis or Justification
Correct:	C	Per RP-AA-460-1001, Level 2 LHRA is an area with dose rates > 15R/hr The RP Manager must provide authorization for this entry.
Distractors:	A	The level is incorrect. The area is a Level 2 (>15R/hr), which requires authorization from the RP Manager for issuing the key.
	B	The level is incorrect, and the Plant Manager's authorization is NOT required.
	D	While the level is correct, the RP Manager must provide authorization for this entry.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			10CFR55.43(b) (4)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam – 2007 ☐ Other Exam Bank	
Reference(s):	RP-AA-460; RP-PB-460-1001		
Learning Objective:	PLOT-1770-3		
K/A System	N/A	Importance:	SRO 3.8
K/A Statement G2.3.13 – Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities access to locked high-radiation areas, aligning filters, etc.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

23. Given the following:

- A radiological accident condition has occurred at Peach Bottom
- 2 VENT EXH STACK RAD MONITOR HI/TROUBLE A (218 B-5) alarms
- 2 VENT EXH STACK RAD MONITOR HI/TROUBLE B (218 C-5) alarms
- The PRO reports that the Unit 2 Vent Stack Radiation is reading above the HI alarm level

The source of the radiation release is the ____(1)____ and the CRS must ____(2)____.

A. (1) Standby Gas Treatment Exhaust
(2) enter and execute T-104 "Radioactivity Release"

B. (1) Radwaste Building Ventilation Exhaust
(2) direct the termination of radwaste processing using the appropriate radwaste procedures

C. (1) Recombiner Building Ventilation Exhaust
(2) direct the evacuation of all unnecessary recombiner personnel using GP-15 "Local Evacuation"

D. (1) PEARL Building Ventilation Exhaust
(2) direct restarting ventilation using SO 40AA.1.A "Setup and Operation of PEARL Heating and Ventilation"

Answer Key		
Question # 23 SRO		
Choice		Basis or Justification
Correct:	B	The Radwaste Building Vent Exhausts to the Unit 2 Vent Stack. Radwaste operations must be terminated under these conditions.
Distractors:	A	The SBGT Exhaust is to the Main Stack. T-104 would not be entered until radiation reached the HI HI alarm point.
	C	The Recombiner Building Exhaust is to the Unit 3 Vent Stack. Evacuating all unnecessary personnel from the recombiner would be correct if it was the source of the leak.
	D	The PEARL Building Exhaust is to the Unit 3 Vent Stack. Restarting ventilation would be appropriate if the PEARL was the source.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(5)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam – 2005 ☐ Other Exam Bank	
Reference(s):	ON-104		
Learning Objective:	PLOT-PBIG-1540-9a		
K/A System	N/A	Importance:	SRO 3.8
K/A Statement G2.3.14 – Knowledge of radiation or contamination hazards that may arise during normal, abnormal or emergency conditions or activities.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

24. Unit 2 was operating normally when Drywell temperature and pressure began to rise. The crew entered ON-120 "High Drywell Temperature" and OT-101 "High Drywell Pressure".

The CRS determined that Drywell temperature and pressure CANNOT be maintained below 145 degrees F and 2 psig, respectively.

Which one of the following identifies how ON-120 and OT-101 are required to be used in conjunction with T-102 "Primary Containment Control"?

A. Exit ON-120 AND OT-101; continue actions per T-102 ONLY.

B. Exit ON-120 ONLY; continue actions per OT-101 AND T-102 concurrently.

C. Exit OT-101 ONLY; continue actions per ON-120 AND T-102 concurrently.

D. Continue actions per ON-120 AND OT-101 concurrently with T-102.

Answer Key		
Question # 24 SRO		
Choice		Basis or Justification
Correct:	D	Per ON-120, "Operator Action" step 2.1, ON-120 must be executed concurrently with T-102. Per OT-101, "Follow-up Action" step 3.3, OT-101 must be executed concurrently with T-102.
Distractors:	A	ON-120 and OT-101 must be executed concurrently with T-102.
	B	ON-120 must also be executed concurrently with T-102.
	C	OT-101 must also be executed concurrently with T-102.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
FUNDAMENTAL			10CFR55.43(b)(5)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	ON-120; OT-101; T-102		
Learning Objective:	PLOT-2102-3		
K/A System	N/A	Importance: SRO	4.5
K/A Statement G2.4.8 – Knowledge of how abnormal operating procedures are used in conjunction with EOPs.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:	NOTE: this question is designated as SRO ONLY because: (1) It cannot be answered by knowing immediate operator actions or TRIP entry conditions (must know follow-up actions). (2) It requires recall of a strategy or action that is written into a plant procedure, including when the strategy or action is taken. (3) It is an SRO job function to determine when conditions/requirements for exiting ON's and OT's are met.		

25. Both units were operating at 100% power when an earthquake occurred. The following conditions were initially present:

- The tremor was felt in the Main Control Room
- SEISMIC TRIG ACTIVATION OR LOSS OF SEISMIC INST POWER (316 A-4) alarmed
- The crew entered SE-5 "Earthquake" and validated the event
- Seismic instrumentation registered 0.045 g

Several minutes later, the following conditions existed on Unit 3:

- Drywell pressure is 2.1 psig and rising
- Drywell temperature is 155 degrees F and rising
- DRYWELL HI PRESS TRIP (310 F-1) alarm is received
- GROUP II/III INBOARD ISOL. RELAYS NOT RESET (314 D-1) alarm is received
- GROUP II/III OUTBOARD ISOL. RELAYS NOT RESET (314 E-1) alarm is received
- The PRO reports AO-30464 "Reactor Bldg. Supply Valve" failed to isolate

Refer to EP-AA-1007, Table PBAPS 3-1 "EAL Matrix" PROVIDED SEPARATELY to determine the highest EAL classification required for these conditions?

A. Alert per FA1

B. Alert per HA5

C. Unusual Event per FU1

D. Unusual Event per HU5

Answer Key		
Question # 25 SRO		
Choice		Basis or Justification
Correct:	A	Based on Drywell pressure above 2 psig and rising Drywell temperature the conditions for a loss of the reactor coolant pressure boundary have been met. This results in an Alert classification IAW FA1.
Distractors:	B	Per HA5, seismic instrumentation must exceed 0.05 g for the Alert level
	C	All of the conditions for a loss of Primary Containment have not been met. Specifically, although a RB ventilation damper failed to isolate, the line is isolated by a second damper and therefore no pathway to the environment exists.
	D	The criteria for declaring a UE per HU5 have been met but this is not the highest classification for the given conditions.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(5)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam ☐ Other Exam Bank	
Reference(s):	EP-AA-1007		
Learning Objective:	G6-8		
K/A System	N/A	Importance:	SRO 4.3
K/A Statement G2.4.45 – Ability to prioritize and interpret the significance of each annunciator or alarm.			
REQUIRED MATERIALS:	**EP-AA-1007, Table PBAPS 3-1 (EAL MATRIX)**		
Notes and Comments:			