1. Unit 2 is operating at 100% power.

   An electrical transient on 2 Aux Bus resulted in a loss of power to the 2B and 2C Drywell Chillers.

   Which one of the following describes the impact of this event, if any, on cooling water to the Instrument Nitrogen compressors?

   A. No impact; the compressors will continue to be cooled by RBCCW.

   B. RBCCW cooling to the compressors will be lost; TBCCW will automatically align to cool the compressors.

   C. RBCCW cooling to the compressors will be lost; the compressors must be shutdown and nitrogen loads must be aligned to Instrument Air.

   D. RBCCW cooling to the compressors will be lost; the compressors must be shutdown and nitrogen loads must be aligned to Backup Nitrogen (bottles).

Answer Key		
Question # 1 RO		
Choice		Basis or Justification
Correct:	C	A loss of power to 2 of 3 DW chillers results in an automatic swap of the DWCW supply to RBCCW. This causes non-essential RBCCW loads to be isolated, which includes the Instrument Nitrogen compressors. Per AO 44A.1-2, Instrument Nitrogen will be shutdown and nitrogen loads will be aligned to Instrument Air (via AO-4230A/B).
Distracters:	A	When RBCCW is transferred to DWCW, the Instrument Nitrogen compressors will lose RBCCW cooling.
	B	TBCCW is a backup cooling source for the Instrument Air compressors; NOT a backup cooling source for the Instrument Nitrogen compressors.
	D	Per AO 44A.1-2, Instrument Nitrogen will be shutdown and aligned to (backed up by) Instrument Air, not "Backup Instrument Nitrogen (bottles).

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH	2	2	10CFR55.41(b)(10)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	AO 44A.1-2; SO 16.2.A-2		
Learning Objective:	PLOT-5035-4c		
K/A System:	300000 – Instrument Air System (IAS)	Importance:	RO / SRO 2.8 / 2.9
K/A Statement: K1.04 – Knowledge of the connections and / or cause effect relationships between Instrument Air System and the following: Cooling water to compressor.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:	**This question addresses "loss of cooling to instrument nitrogen compressors", which the author believes meets the intent of the K/A.**		

2. Unit 2 is at 100% power when the 2PPB (20D22) 125 VDC (Division II) power supply is lost.

   Which one of the following plant components will be directly affected by this loss of 125 VDC power?

   A. RCIC logic

   B. HPCI logic

   C. E-3 Diesel Generator control power

   D. 'A' Loop RHR logic

Answer Key		
Question # 2 RO		
Choice		Basis or Justification
Correct:	B	HPCI Logic is powered from Div II, 2PPD, Pnl 20D22.
Distracters:	A	RCIC Logic is powered from Div I, 2PPA, Pnl 20D21.
	C	E-3 Control Power is supplied from Unit 3 Div I, 3PPA, Pnl 30D23.
	D	'A' Loop RHR Logic is powered from Div I, 2PPC, Pnl 20D23.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY			10CFR55.41(b)(8)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	E-26; SE-13 Attachment 3, Part 1		
Learning Objective:	PLOT-5023-2c		
K/A System:	206000 – High Pressure Coolant Injection System	Importance:	RO / SRO 3.7 / 3.8
K/A Statement: K1.07 – Knowledge of the physical connections and/or cause-effect relationships between High Pressure Coolant Injection System and the following: D.C. power.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

3. Unit 2 Backup Scram Valves (SV-2-3-140A and SV-2-3-140B) are powered from ____(1)____ and are normally ____(2)____.

A. (1) Safety-Related DC
(2) de-energized

B. (1) Safety-Related DC
(2) energized

C. (1) 120 VAC RPS
(2) de-energized

D. (1) 120 VAC RPS
(2) energized

Answer Key		
Question # 3 RO		
Choice		Basis or Justification
Correct:	A	The Backup Scram Valves are powered from 125 VDC panels 2PPA (Div. I) and 2PPB (Div. II), respectively. They are normally de-energized and energize to function.
Distracters:	B	Power supply is correct; the Backup Scram Valves are normally de-energized.
	C	Power supply is incorrect.
	D	Power supply is incorrect; the Backup Scram Valves are normally de-energized.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY			10CFR55.41(b)(7)

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-5003A-2c	
K/A System:	263000 – D.C. Electrical Distribution	Importance: RO / SRO 3.1 / 3.4
K/A Statement: K2.01 – Knowledge of electrical power supplies to the following: Major D.C. loads.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

4. The following conditions and events exist on Unit 2:

- Shutdown, with a cooldown in progress
- Reactor pressure is 420 psig and lowering
- Loss of 125 VDC power to the 'A' logic of RHR
- Drywell pressure to rises to 2.2 psig

Which one of the following describes the current status of the RHR pumps?

A. ALL RHR pumps are running; they are injecting into the vessel.

B. ALL RHR pumps are running; they are NOT injecting into the vessel.

C. ONLY B & D RHR pumps are running; they are injecting into the vessel.

D. ONLY B & D RHR pumps are running; they are NOT injecting into the vessel.

Answer Key		
Question # 4 RO		
Choice		Basis or Justification
Correct:	B	RHR logic power is cross-division powered, such that a loss of one 125 VDC supply does not impact LPCI pump starts (unlike Core Spray). Per TRIPs, RHR pump shutoff head is 305 psig, which is well above reactor pressure; so they are not injecting.
Distracters:	A	RHR pump shutoff head is 305 psig, so they are not injecting.
	C	Even with loss of 'A' logic 125 VDC, all RHR/LPCI pumps are running. RHR pump shutoff head is 305 psig, so they are not injecting.
	D	Even with loss of 'A' logic 125 VDC, all RHR/LPCI pumps are running.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(7)

Source Documentation		
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam: (PB 2007) ☐ Other Exam Bank: ()
Reference(s):	SO 10.7.B-2; T-101	
Learning Objective:	PLOT-5010-6b	
K/A System	203000 – RHR/LPCI: Injection Mode	Importance: RO / SRO 2.7 / 2.9
K/A Statement: K2.03 – Knowledge of the electrical power supplies to the following: Initiation logic.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

5. Unit 2 is operating at 100% power when the following alarm is received:

   - BLOWDOWN RELIEF VALVES BELLOWS LEAKING (227 B-5)

   Investigation determines that Safety Relief Valve RV-71B bellows has ruptured.

   Which of the following methods of SRV 71B actuation, if any, are <u>available</u> with this failure present?

   1. Manual operation from the Main Control Room
   2. Automatic operation due to high reactor pressure
   3. Automatic operation due to ADS logic actuation
   4. SRV 71B will <u>NOT</u> actuate with this failure present

   A. 1 and 2

   B. 2 and 3

   C. 1 and 3

   D. 4

Answer Key		
Question # 5 RO		
Choice		Basis or Justification
Correct:	C	The bellows will not pressurize to actuate second stage to open main disc on overpressure. Pneumatic operation via MCR switch or ADS logic is still available.
Distractors:	A	The bellows will not pressurize to actuate second stage to open main disc on overpressure.
	B	The bellows will not pressurize to actuate second stage to open main disc on overpressure.
	D	Pneumatic operation via MCR switch or ADS logic is still available.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(6)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	ARC-227 B-5		
Learning Objective:	PLOT-5001A-3m		
K/A System:	239002 – Safety Relief Valves	Importance:	RO / SRO 3.9 / 4.0
K/A Statement: K3.01 – Knowledge of the effect that a loss or malfunction of the Safety Relief Valves will have on following: Reactor pressure control.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

6. A LOOP/LOCA occurred on Unit 3. There are no RHR pumps available for injection.

Which one of the following conditions assures Adequate Core Cooling, per T-111 "Level Restoration" Bases?

	RPV Water Level	CS Pumps in Operation	'A' Loop Flow	'B' Loop Flow
A.	-200 inches	3D ONLY	0 GPM	3100 GPM
B.	-210 inches	3A and 3B	3100 GPM	3100 GPM
C.	-220 inches	3B and 3D	0 GPM	6300 GPM
D.	-230 inches	3A and 3C	6300 GPM	0 GPM

Answer Key		
Question # 6 RO		
Choice		Basis or Justification
Correct:	C	To meet ACC requirements of T-111, RPV level must either be maintained above -195 inches (MSCRWL), or at or above -226 inches with the design Core Spray loop flow of at least 6250 gpm.
Distracters:	A	At least 6250 gpm Core Spray loop flow is required.
	B	The Core Spray flow of 6250 gpm must be from one loop; not a combination of two loops.
	D	RPV level must be at or above -226 inches to meet spray cooling requirements.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(8)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	T-111 and Bases		
Learning Objective:	PLOT-5014-3a		
K/A System:	209001 – Low Pressure Core Spray System	Importance:	RO / SRO 3.8 / 3.9
K/A Statement: K3.01 – Knowledge of the effect that a loss or malfunction of the Low Pressure Core Spray System will have on following: Reactor water level.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

7. Which one of the following completes the statement below, per Technical Specifications?

With Reactor Power at 84% and Recirc Drive Flow of 78%, the APRM Rodblock setpoint is ____(1)____ and APRM Scram setpoint is ____(2)____.

A. (1) 104.4%
(2) 115.2%

B. (1) 105.2%
(2) 114.4%

C. (1) 108.4%
(2) 118.0%

D. (1) 109.1%
(2) 118.3%

Answer Key		
Question # 7 RO		
Choice		Basis or Justification
Correct:	B	These are the correct Tech Spec and TRM values: Rod Block is .65(78) + 54.5 = 105.2%; Scram is .65(78) + 63.7 = 114.4%.
Distracters:	A	This choice manipulates the formula: .65(78) + **53.7** = 104.4%; and .65(78) + **64.5** = 115.2%.
	C	These are the "clamped" values for the Rod Block setpoint (108.4%) and the Scram setpoint (118.0%).
	D	This choice uses power (84%) in place of drive flow: .65(**84**) + 54.5 = 109.1%; and .65(**84**) + 63.7 = 118.3%.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(7)

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	Tech Spec Table 3.3.1.1-1, Function 2.b; TRM Table 3.2-1, Function 3.a		
Learning Objective:	PLOT-5060-4f		
K/A System:	215005 – Average Power Range Monitor/Local Power Range Monitor System	Importance:	RO / SRO 3.7 / 3.7
K/A Statement: K4.07 – Knowledge of Average Power Range Monitor/Local Power Range Monitor System design feature(s) and/or interlocks which provide for the following: Flow biased trip setpoints.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

8. Both units are operating at 100% power. Surveillance testing is in progress on the E1 EDG per ST-O-052-201-2 "E1 Diesel Generator Slow Start and Full Load Test".

During initial loading, ONE OF THE THREE Lube Oil Pressure switches fails low. Oil pressure is normal.

Which one of the following describes the impact of this condition on the E-1 Diesel Generator?

The E-1 Diesel Generator will ____(1)____ and ____(2)____ alarms will be received.

A. (1) continue to run
(2) NO

B. (1) continue to run
(2) local and Control Room

C. (1) trip immediately
(2) local and Control Room

D. (1) trip in 5 seconds
(2) local and Control Room

Answer Key		
Question # 8 RO		
Choice		Basis or Justification
Correct:	B	There are 3 low pressure switches. Any one will bring in local alarm 0AC097 F-1 "Lube Oil Low Pressure" and MCR alarm 001 G-5 "E1 Diesel Gen Trouble". 2 of 3 pressure switches must sense low pressure for a trip to occur, which is time-delayed for 5 seconds.
Distracters:	A	Low pressure sensed by any one pressure switch will bring in the local and Control Room alarms.
	C	2 of 3 pressure switches must sense low pressure for the trip to occur.
	D	2 of 3 pressure switches must sense low pressure for the trip to occur.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY			10CFR55.41(b)(8)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	ARC-001 E-5; ARC-001 G-5; ARC-0AC097 F-1		
Learning Objective:	PLOT-5052-4a		
K/A System:	264000 – Emergency Generators (Diesel/Jet)	Importance:	RO / SRO 3.5 / 3.7
K/A Statement: K4.01 – Knowledge of Emergency Generators (Diesel/Jet) design feature(s) and/or interlocks which provide for the following: Emergency generator trips (normal)			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

9. Unit 2 has been shutdown for 14 days with the following conditions:

- The Reactor is in Mode 4
- Reactor water level on LI-86 is +45 inches
- RWCU is running with one NRHX in service
- The 2B RHR pump is running in Shutdown Cooling and must be removed from service due to emergent maintenance on the pump
- The 'A' loop of RHR is NOT available
- The 2D RHR pump is available

For these conditions, which one of the following will satisfy the decay heat removal requirements of GP-12 "Core Cooling Procedure"?

Refer to the NEXT THREE PAGES for:

1. Decay Heat Removal Curve
2. Table 1 of GP-12 "Core Cooling Procedure"
3. Attachment 1 of ON-125 "Loss or Unavailability of Shutdown Cooling"

A. The 2D RHR pump and HX.

B. RWCU in its current configuration.

C. Raising RPV level above +50 inches.

D. Alternate Shutdown Cooling per ON-125.

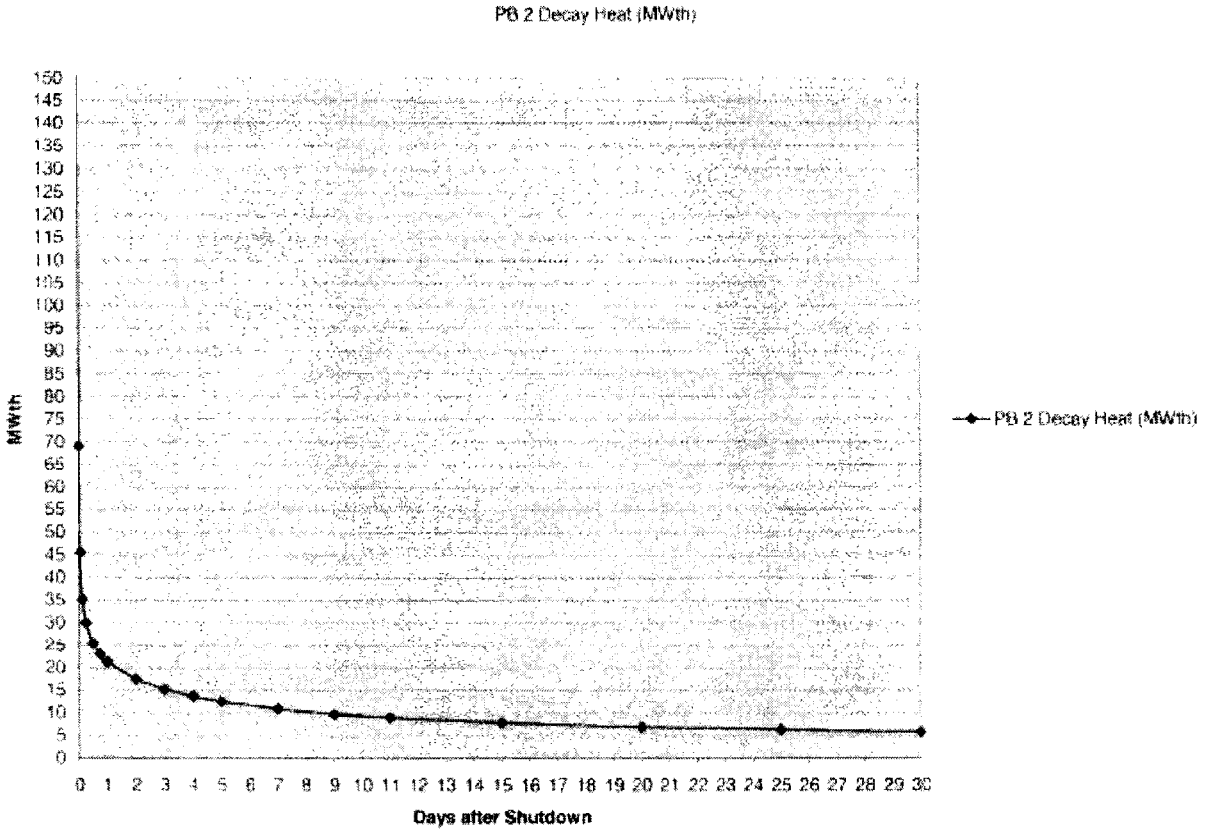

PB 2 Decay Heat (MWth)
MWth
Days after Shutdown
PB 2 Decay Heat (MWth)

TABLE 1 TYPICAL HEAT REMOVAL CAPACITY

System/Component	Capacity	Reference
One RHR Heat Exchanger	20.5 MW	Design (FSAR Table 4.8.1)
2D RHR Hx with MO-2-10-089D Valve closed and 3" manual bypass around MO-2-10-089D open	2.3 MW	Calculated (500 gpm) MAT 1324
3A RHR Hx with MO-3-10-089A Valve closed and 3" manual bypass around MO-3-10-089A open	2.3 MW	Calculated (500 gpm) MAT 1324
One RWCU NRHX	4.4 MW	Design (M-1-JJ-31)
One Fuel Pool Cooling Hx *	1.1 MW	Design (FSAR Table 10.5.1)
Two Fuel Pool Cooling Hx *	2.2 MW	
Three Fuel Pool Cooling Hx *	3.3 MW	

* Assumes 550 gpm per heat exchanger and service water temperature of 90°F

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 # 9 RO		
Choice		Basis or Justification
Correct:	A	Per Table 1 of GP-12, one RHR HX (2D in this case) will provide 20.5 MW of heat removal capability. Per Table 1, the 2D HX will only provide 2.3 MW of heat removal capability with the 89D valve closed and its bypass valve full open; this is not a required lineup/configuration and therefore the 2D RHR subsystem will provide the full 20.5 MW of heat removal capability.
Distracters:	B	Based on the DHR curve, there is ~ 8 MW of decay heat load. Per Table 1 of GP-12, RWCU can only handle 4.4 MW of decay heat load.
	C	Raising RPV level to above +50 inches is directed by GP-12 when there are no Recirc or SDC pumps in operation in order to promote natural circulation. It does not satisfy any decay heat removal requirements. In addition, since the 2D RHR subsystem is available, it is required to be placed in service per GP-12 (and ON-125).
	D	Use of Alternate Shutdown Cooling is directed from ON-125 when no RHR SDC subsystems are available. Since the 2D RHR subsystem is available, this has priority. In addition, one of the prerequisites of AO 10.12-2 "Alternate Shutdown Cooling" is "normal shutdown cooling is not available."

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(10)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	GP-12; ON-125		
Learning Objective:	PLOT-PBIG-1550-28b, -28c		
K/A System:	205000 – Shutdown Cooling System (RHR Shutdown Cooling Mode)	Importance:	RO / SRO 2.8 / 3.1
K/A Statement: K5.03 – Knowledge of the operational implications of the following concepts as they apply to Shutdown Cooling System (RHR Shutdown Cooling Mode): Heat removal mechanisms.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

10. During an ATWS condition, the URO started System 'A' Standby Liquid Control (SLC). The following plant conditions exist:

    - RPV pressure is 1020 psig
    - SLC discharge pressure is 1100 psig
    - The 'A' SLC Squib Valve failed to fire

    Based on these conditions, which statement is correct regarding the expected capability of SLC to inject boron for reactor shutdown?

    A. SLC is injecting normally at full flow and reactor shutdown will occur as designed.

    B. SLC is injecting at reduced flow and reactor shutdown will occur later than designed.

    C. SLC is NOT injecting and System 'B' must be initiated to shutdown the reactor as designed.

    D. SLC is NOT injecting and initiating System 'B' will NOT shutdown the reactor as designed.

Answer Key		
Question # 10 RO		
Choice		Basis or Justification
Correct:	A	One squib valve failure will not prevent injection. RPV and system pressure parameters are normal for injection.
Distractors:	B	Although the squib valves are piped in parallel, the system is sized such that full flow is provided from each SLC squib valve.
	C	Although SLC has two trains, the pumps and squib valves are cross-connected and only one is required for injection.
	D	SLC will inject since the valves are in parallel, not series.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH	2.75	3	10CFR55.41(b)(6)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam: (PB 2002) ☐ Other Exam Bank: ()	
Reference(s):	SO 11.1.A-2 COL		
Learning Objective:	PLOT-5011-5c		
K/A System:	211000 – Standby Liquid Control System	Importance:	RO / SRO 3.1 / 3.2
K/A Statement: K5.04 – Knowledge of the operational implications of the following concepts as they apply to Standby Liquid Control System: Explosive valve operation.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

11. The following conditions exist following a LOOP:

- No EDGs are running
- A small-break LOCA exists on Unit 2
- BLOWDOWN TIMERS INITIATED (227 D-4) alarms 1 hour into the event
- ADS has NOT been inhibited
- Backup Instrument Nitrogen has been aligned per T-261 "Placing the Backup Instrument Nitrogen Supply From CAD In Service"

With no further operator action, ADS logic will _____.

A. initiate a blowdown, with the CAD tank supplying required nitrogen for ADS valve operation

B. initiate a blowdown, with Backup Nitrogen bottles supplying required nitrogen for ADS valve operation

C. NOT initiate a blowdown, due to lack of DC power to ADS logic

D. NOT initiate a blowdown, due to lack of AC power to ECCS pumps

Answer Key		
Question # 11 RO		
Choice		Basis or Justification
Correct:	D	AC power is not available to supply LP ECCS pumps, which is required for ADS logic actuation.
Distracters:	A	ADS will NOT initiate due to lack of LP ECCS pump power.
	B	ADS will NOT initiate due to lack of LP ECCS pump power.
	C	ADS will NOT initiate due to lack of LP ECCS pump power. DC power IS available to ADS logic.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(7)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	PLOT-5001G		
Learning Objective:	PLOT-5001G-6a		
K/A System:	218000 – Automatic Depressurization System	Importance:	RO / SRO 3.0 / 3.1
K/A Statement: K6.05 – Knowledge of the effect that a loss or malfunction of the following will have on the Automatic Depressurization System: A.C. power.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

12. Panel 20Y050 is aligned to its normal power supply when an inverter internal fault occurs in the Static Inverter Cabinet.

For these conditions, the Static Switch ____(1)____ automatically transfer 20Y050 to its alternate source and power to 20Y050 will be ____(2)____.

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

B. (1) will
(2) temporarily interrupted during Static Switch operation

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

D. (1) will NOT
(2) lost until the Manual Bypass Switch is placed in "LOAD TO BYPASS"

Answer Key		
Question # 12 RO		
Choice		Basis or Justification
Correct:	A	The static switch transfers 20Y050 to E124-R-C on internal fault, over-current, or under-voltage. This is done without interruption of power to 20Y050.
Distracters:	B	There is no interruption of power to 20Y050 during static switch operation.
	C	The static switch transfers 20Y050 to E124-R-C on internal fault, over-current, or under-voltage.
	D	The static switch transfers 20Y050 to E124-R-C on internal fault, over-current, or under-voltage.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY			10CFR55.41(b)(7)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	E-28		
Learning Objective:	PLOT-5058-5c		
K/A System:	262002 – Uninterruptable Power Supply (A.C./D.C.)	Importance:	RO / SRO 2.7 / 2.9
K/A Statement: K6.03 – Knowledge of the effect that a loss or malfunction of the following will have on the Uninterruptable Power Supply (A.C./D.C.): Static inverter.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

13. Given the following:

- Unit 2 is operating at 100% power
- Both RPS buses are on their normal feed
- 'A' RPS M-G Set output voltage slowly rises due to regulator failure, causing output voltage to exceed 133 V

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

1. Trip of M-G Set input breaker
2. Trip of M-G Set output breakers and half scram after 1.5 second time delay
3. Trip of M-G Set output breakers and half scram after ~ 8 second time delay

A. 1 and 2

B. 1 and 3

C. 2

D. 3

Answer Key		
Question # 13 RO		
Choice		Basis or Justification
Correct:	C	High voltage will trip the output breakers but not the MG set, causing a half-scram on the 'A' channel. The 1.5 second time delay is associated with the OV trip on the RPS output breakers.
Distracters:	A	Incorrect because the MG set does not trip – plausible because the candidate could confuse input and output breaker trip functions.
	B	Incorrect because the MG set does not trip – plausible because the candidate could confuse input and output breaker trip functions. ALSO, the ~ 8 second time delay is a function of the MG set flywheel – designed to help RPS "ride out" an input power supply transfer. Plausible because the 8 second time delay is real.
	D	Incorrect because the 8 second time delay is a function of the MG set flywheel – designed to help RPS "ride out" an input power supply transfer. Plausible because the 8 second time delay is real.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(7)

Source Documentation		
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()
Reference(s):	M-1-S-54; E-2365	
Learning Objective:	PLOT-5060F-3d	
K/A System:	212000 – Reactor Protection System	Importance: RO / SRO 2.8 / 2.9
K/A Statement: A1.01 – Ability to predict and/or monitor changes in parameters associated with operating the Reactor Protection System controls including: RPS motor-generator output voltage.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

14. Unit 3 Reactor startup is in progress, on approach to criticality.

A control rod adjacent to WRNM Channel 'G' detector is being withdrawn.

As the control rod tip is withdrawn past the 'G' detector, the operator will see 'G' reactor period become ____(1)____ due to ____(2)____ neutron population change.

A. (1) shorter
(2) core-wide

B. (1) longer
(2) core-wide

C. (1) shorter
(2) local

D. (1) longer
(2) local

Answer Key		
Question # 14 RO		
Choice		Basis or Justification
Correct:	C	Shorter period is to be expected, and the effect is due to local neutron population changes – since the core is still sub-critical, reactivity changes in the periphery will have localized affect.
Distracters:	A	Shorter period is to be expected, but the effect is localized as the reactor is still sub-critical and the G detector is near core periphery.
	B	Period is to be expected to shorten, not lengthen, and the effect is localized as the reactor is still sub-critical and the G detector is near core periphery.
	D	Shorter period is to be expected – not longer, and the effect is due to local neutron population changes – since the core is still sub-critical, reactivity changes in the periphery will have localized affect.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY			10CFR55.41(b)(1)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	GP-2		
Learning Objective:	PLOT-5060-5b		
K/A System:	215003 – Intermediate Range Monitor (IRM) System	Importance:	RO / SRO 3.7 / 3.7
K/A Statement: A1.02 – Ability to predict and/or monitor changes in parameters associated with operating the Intermediate Range Monitor (IRM) System controls including: Reactor power indication response to rod position changes.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

15. Unit 2 is operating at 100% power.

- The PRO manually taps down 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 and the E12 BUS UNDERVOLTAGE (001 D-1) alarm is received.
- The PRO checks the status of the E-12 Bus after 2 minutes have elapsed.

The PRO would find the E-12 Bus energized from the ____(1)____. This transient will require the crew to reset an ____(2)____.

A. (1) alternate offsite feed
(2) Outboard Group II Isolation IAW GP-8D "Groups I, II, and III Outboard Half Isolation"

B. (1) E-1 Diesel Generator
(2) Outboard Group II Isolation IAW GP-8D "Groups I, II, and III Outboard Half Isolation"

C. (1) alternate offsite feed
(2) Inboard Group II Isolation IAW GP-8C "Groups I, II, and III ~~Outboard~~ Inboard Half Isolation"

D. (1) E-1 Diesel Generator
(2) Inboard Group II Isolation IAW GP-8C "Groups I, II, and III ~~Outboard~~ Inboard Half Isolation"

Answer Key		
Question # 15 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)	RO
HIGH			10CFR55.41(b)(7)

Source Documentation		
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam: (PB 2008) ☐ 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 3.1 / 3.4
K/A Statement: A2.09 – Ability to (a) predict the impacts of the following on AC Electrical Distribution; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Exceeding voltage limitations.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

16. Unit 2 was initially operating at 100% power.

- A manual scram is performed and the Standby Gas Treatment (SBGT) System automatically starts and aligns
- 10 minutes later, AO 00475-01 "SBGT 'A' Filter Inlet" closes and cannot be re-opened
- The SBGT System is expected to remain in service for an extended period of time

Which one of the following describes (1) the impact of these conditions on SBGT System operation and (2) the actions required by SO 9A.1.C "Response to SBGT System Automatic Start"?

The valve closure ____(1)____ prevent SBGT from maintaining Secondary Containment at a negative pressure. The operator must ____(2)____.

A. (1) will
(2) start an additional SBGT fan

B. (1) will
(2) secure the 'A' SBGT Filter Train

C. (1) will NOT
(2) start an additional SBGT fan

D. (1) will NOT
(2) secure the 'A' SBGT Filter Train

Answer Key		
Question # 16 RO		
Choice		Basis or Justification
Correct:	D	Each filter train is 100% capacity. Closing the inlet damper does not prevent the system from maintaining design negative pressure in the Secondary Containment. SO 9A.1.C directs closure of one Filter Train Inlet and Outlet valve if the system is to remain in service for an extended period of time.
Distracters:	A	Each filter train is 100% capacity. SO 9A.1.C directs verifying A and B fans are running, but does NOT direct starting additional SBGT fans.
	B	Each filter train is 100% capacity.
	C	SO 9A.1.C directs verifying A and B fans are running, but does NOT direct starting additional SBGT fans.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(7)

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-3a		
K/A System:	261000 – Standby Gas Treatment System	Importance:	RO / SRO 2.9 / 2.9
K/A Statement: A2.06 – Ability to (a) predict the impacts of the following on the Standby Gas Treatment System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Valve closures.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

17. Unit 2 is initially operating at 100% power when:

- A LOCA occurs
- An MCA signal starts all 4 EDGs
- The PRO verifies start of the 'A' and 'B' ESW pumps, and the ECW pump
- The PRO verifies proper ESW header pressure and secures the 'B' ESW pump
- Ten minutes later, the 'A' ESW pump trips

Assuming no further operator actions, what is the status of the 'B' ESW pump and the ECW pump two minutes after the 'A' ESW pump trips?

The 'B' ESW pump is ____(1)____ and the ECW pump is ____(2)____.

A. (1) running
(2) running

B. (1) NOT running
(2) running

C. (1) running
(2) NOT running

D. (1) NOT running
(2) NOT running

Answer Key		
Question # 17 RO		
Choice		Basis or Justification
Correct:	C	After initial start sequence following EDG start, when the 'B' ESW pump is shutdown to standby, the 'B' ESW pump will re-start when the 'A' ESW pump has low discharge pressure (<25 psig for 25 sec).
Distracters:	A	After initial start sequence, the ECW pump will auto-start when both ESW pumps experience low discharge pressure, but it will shutdown once the 'B' ESW pump auto-starts and develops discharge pressure.
	B	The 'B' ESW pump re-started when the 'A' ESW pump had low discharge pressure (<25 psig for 25 sec) – the ECW pump also started, but turns OFF when the 'B" ESW pump develops discharge pressure.
	D	The 'B' ESW pump re-started when the 'A' ESW pump had low discharge pressure (<25 psig for 25 sec) – the ECW pump also started, but turns OFF when the 'B" ESW pump develops discharge pressure.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(8)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	SO 52A.1.B; ARC 212 B-2; ARC 002 A-5		
Learning Objective:	PLOT-5033-4a		
K/A System:	400000 – Component Cooling Water System (CCWS)	Importance:	RO / SRO 3.0 / 3.0
K/A Statement: A3.01 – Ability to monitor automatic operations of the CCWS including: Setpoints on instrument signal levels for normal operations, warnings, and trips that are applicable to the CCWS.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

18. A startup was in progress on Unit 2 when a scram occurred on High Drywell Pressure. Reactor level was maintained greater than +10 inches.

Which of the following PCIS Group II Isolation valves received a close signal?

1. IIA: Reactor Water Cleanup
2. IIB: Shutdown Cooling
3. IIC: Feedwater Long-path Recirc
4. IID: Misc. (TIP, TWCU, DW/Torus Inst N2, DW Equip/Floor Drain Sumps)

A. 1, 2 and 3

B. 1, 2 and 4

C. 1, 3 and 4

D. 2, 3 and 4

Answer Key		
Question # 18 RO		
Choice		Basis or Justification
Correct:	D	Group IIA, RWCU valves did not receive a close signal (1", 200 degrees F, 125% flow, SBLC Initiation).
Distracters:	A	Group II B, C, D valves close on 2 psig in the Drywell.
	B	Group II B, C, D valves close on 2 psig in the Drywell.
	C	Group II B, C, D valves close on 2 psig in the Drywell.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY			10CFR55.41(b)(7)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	M-1-S-23		
Learning Objective:	PLOT-5007G-1g		
K/A System:	223002 – Primary Containment Isolation System/Nuclear Steam Supply Shut-Off	Importance:	RO / SRO 3.5 / 3.5
K/A Statement: A3.02 – Ability to monitor automatic operations of the Primary Containment Isolation System/Nuclear Steam Supply Shut-Off including: Valve closures.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

19. Unit 2 scrammed due to low RPV level. The following conditions exist:

- RCIC auto started to restore level, which reached a maximum at +35 inches
- RCIC is now in manual control with the flow controller dialed low (0 gpm)
- RPV level is -10 inches and lowering slowly
- RPV pressure is 940 psig, controlled by EHC
- RCIC discharge pressure is 860 psig
- RCIC turbine speed is 2800 rpm
- RCIC indicated flow is 0 gpm
- Torus and CST levels are normal

With no further operator action, what is the result of leaving RCIC in its current configuration?

RCIC will _____.

A. trip on turbine overspeed

B. pump CST water to the Torus

C. suffer exhaust check valve damage

D. trip on high turbine exhaust pressure

Answer Key		
Question # 19 RO		
Choice		Basis or Justification
Correct:	B	Based on the given conditions, RCIC is running with the minimum flow valve open. Since RCIC suction is lined up to the CST and the minimum flow discharge is to the torus, CST water will be pumped to the torus.
Distracters:	A	RCIC will trip on overspeed under certain conditions: in CST-to-CST mode and MO-23-24 (common return to the CST) closes due to high Drywell pressure or HPCI suction swap from the CST to the Torus. None of the conditions that lead to an overspeed event are given.
	C	Exhaust check valve damage is not a concern above 2200 rpm.
	D	RCIC will not trip on high turbine exhaust pressure under the given conditions. RCIC is designed to run on min flow for extended periods.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(7)

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	M-359 Sheet 1		
Learning Objective:	PLOT-5013-1a		
K/A System:	217000 – Reactor Core Isolation Cooling System	Importance:	RO / SRO 3.4 / 3.3
K/A Statement: A4.03 – Ability to manually operate and/or monitor in the control room: System valves.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

20. The 2B Reactor Feed Pump (RFP) is being started per SO 6C.1.C-2 "Startup of Second or Third Reactor Feedwater Pump".

The following indications exist for the 2B RFP:

- Speed is 2800 RPM
- MSC SELECT is lit
- M/A PERMISSIVE is lit
- M/A SELECT is NOT lit
- M/A is in MANUAL

Based on these indications, the 2B RFP is ready to be transferred to ____(1)____. In order to complete the transfer, the operator must depress ____(2)____.

A. (1) the M/A Station
(2) M/A SELECT

B. (1) the M/A Station
(2) AUTO on the M/A Station

C. (1) the Master Level Controller
(2) AUTO on the M/A Station

D. (1) the Master Level Controller
(2) AUTO on the Master Level Controller

Answer Key		
Question # 20 RO		
Choice		Basis or Justification
Correct:	A	Per SO 6C.1.C-2, these are the indications expected prior to transferring RFP control from MSC to the M/A Station. The transfer is completed by depressing M/A SELECT.
Distracters:	B	Depressing AUTO on the M/A Station transfers RFP control to the Master Level Controller.
	C	RFP control must be transferred to the M/A Station before transferring to the MLC. M/A SELECT is lit and MSC SELECT is not lit when the M/A Station has control of the RFP.
	D	RFP control must be transferred to the M/A Station before transferring to the MLC. M/A SELECT is lit and MSC SELECT is not lit when the M/A Station has control of the RFP.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(7)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	SO 6C.1.C-2		
Learning Objective:	PLOT-5006-4q		
K/A System:	259002 – Reactor Water Level Control System	Importance:	RO / SRO 3.8 / 3.6
K/A Statement: A4.03 – Ability to manually operate and/or monitor in the control room: All individual component controllers when transferring from manual to automatic modes.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

21. ST-O-098-01N-2 "Daily Surveillance Log Mode 1, 2 or 3" directs the following:

> "IF alarm 228 E-2 "N2 Compressor A or B Trouble" is actuated, THEN locally verify N2 Supply Header Pressure is > 85 psig."

Which one of the following describes the purpose of performing the local verification required by the Surveillance Log?

To ensure _____.

A. a long term pneumatic supply source is provided to inboard MSIVs

B. a long term pneumatic supply source is provided to the ADS Valves

C. 'A' or 'B' Instrument Nitrogen Compressors have restarted to supply the Instrument Nitrogen header

D. AO-2-36B-4230A(B) "A(B) Instrument Air Backup to A(B) Instrument Nitrogen Header" valve(s) have closed

Answer Key		
Question # 21 RO		
Choice		Basis or Justification
Correct:	B	SR 3.5.1.3 requires Nitrogen supply pressure to ADS valves to be > 85 psig.
Distracters:	A	Inboard MSIV operability is assured down to 75 psig Nitrogen supply pressure (see ARC 228 E-2).
	C	Purpose of ST verification is ADS Valve operability – ARC will direct use of SO 16.7.B to restore N2 system.
	D	At 85 psig, these valves automatically OPEN. Plausible because candidate could easily transpose the required valve operation.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY			10CFR55.41(b)(7)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	ST-O-098-01N-2; ARC-228 E-2; TS 3.5.1, SR 3.5.1.3		
Learning Objective:	PLOT-5001G-1f		
K/A System:	218000 – Automatic Depressurization System	Importance:	RO / SRO 3.7 / 4.1
K/A Statement: G2.2.12 – Knowledge of surveillance procedures.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

22. Unit 2 is operating at 100% power.

- A loss of Instrument Air transient is in progress
- ON-119 "Loss of Instrument Air" is being executed
- Per ON-119, Backup Air Compressor 2DK001 is started and AO-2-36-80250D "U/2 Backup Air Compressors Emergency Supply Valve" is opened
- No other Instrument Air System components have been manipulated

The Backup Air Compressor is now providing air to the _____.

A. 'A' Instrument Air Header

B. 'B' Instrument Air Header

C. 'A' and 'B' Instrument Air Headers

D. 'A' and 'B' Instrument Air Headers and the Service Air Header

Answer Key		
Question # 22 RO		
Choice		Basis or Justification
Correct:	B	Per ON-119 Bases (and NOTES within the procedure), when the BU air Compressor is placed in service, it is aligned to the 'B' header only.
Distracters:	A	Per ON-119 Bases (and NOTES within the procedure), when the BU air Compressor is placed in service, it is aligned to the 'B' header only.
	C	Per ON-119 Bases (and NOTES within the procedure), when the BU air Compressor is placed in service, it is aligned to the 'B' header only.
	D	Per ON-119 Bases (and NOTES within the procedure), when the BU air Compressor is placed in service, it is aligned to the 'B' header only.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY			10CFR55.41(b)(4)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	ON-119 and Bases		
Learning Objective:	PLOT-5036-5a		
K/A System:	300000 – Instrument Air System (IAS)	Importance:	RO / SRO 4.6 / 4.6
K/A Statement: G2.1.20 – Ability to interpret and execute procedure steps.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

23. An ATWS is in progress on Unit 2.

- Reactor water level cannot be determined
- 5 Safety Relief Valves have been opened
- Reactor pressure is 210 psig and lowering
- 2B and 2D RHR pumps are injecting into the RPV
- Reactor power is 2% and lowering
- T-116 "RPV Flooding", Step RF-36 (next page) is being evaluated

Which one of the following describes the current plant status?

Portions of T-116 are PROVIDED ON THE NEXT PAGE.

A. The steaming rate is less than the feed rate. The reactor is shutdown.

B. Reactor water level is above the main steam lines. Adequate Core Cooling is assured.

C. The current injection rate cannot maintain reactor pressure. Adequate Core Cooling is NOT assured.

D. Current reactor decay heat is insufficient to vaporize the injecting torus water. Water level is at the top of active fuel.

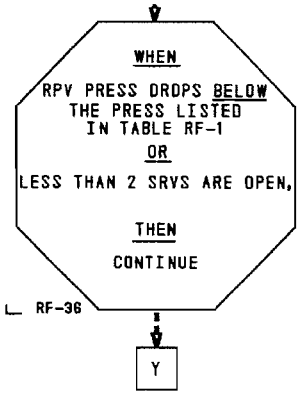
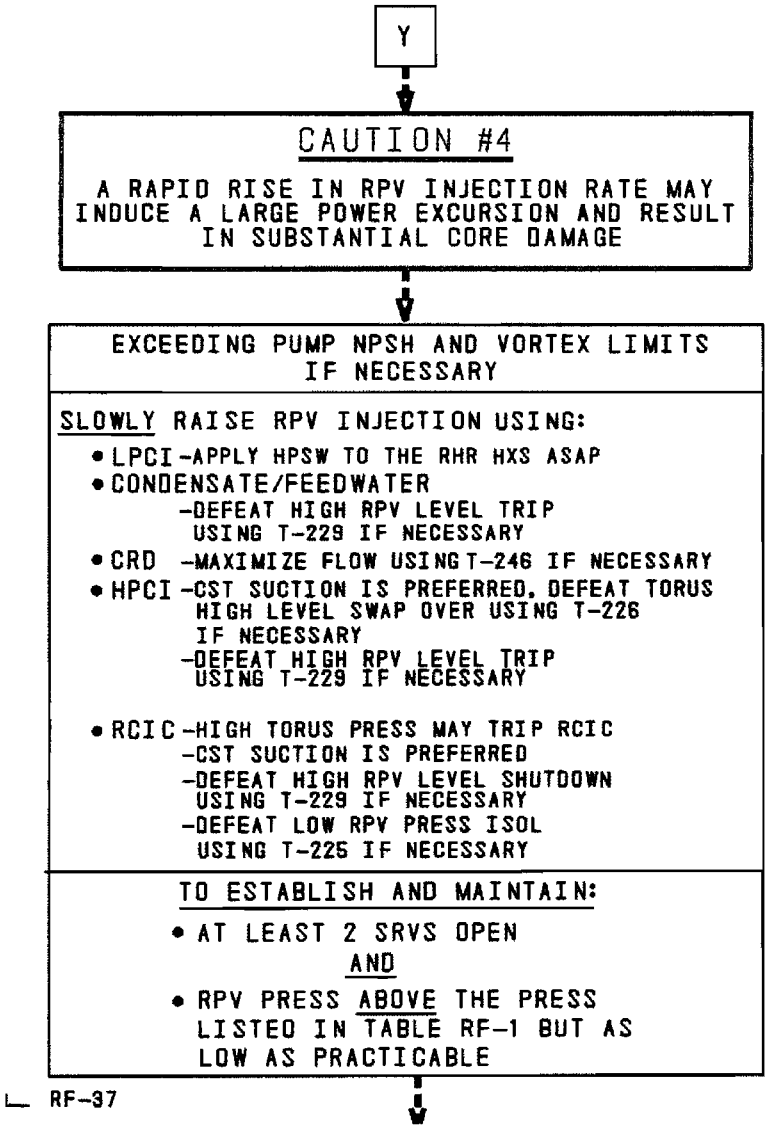


TABLE RF-1

NUMBER OF OPEN SRVS	RPV PRESS (PSIG)
5 OR MORE	270
4	340
3	460
2	700



Answer Key		
Question # 23 RO		
Choice		Basis or Justification
Correct:	C	ACC under these conditions requires the ability to maintain Minimum Steam Cooling Pressure (MSCP).
Distracters:	A	The conditions do not meet the definition for Reactor Shutdown (Reactor power below the heating range and known to be subcritical)
	B	Insufficient information to determine water level wrt Main Steam lines. ACC is NOT assured as we are below the MSCP.
	D	Not necessarily true – with pressure and power decreasing, equilibrium conditions have not been established – cannot make conclusion wrt water level.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(10)

Source Documentation		
Source:	☐ New Exam Item ☒ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()
Reference(s):	T-116 and Bases	
Learning Objective:	PLOT-2116-4a	
K/A System:	203000 – RHR/LPCI: Injection Mode	Importance: RO / SRO 3.5 / 3.7
K/A Statement: K5.02 – Knowledge of the operational implications of the following concepts as they apply to RHR/LPCI: Injection Mode: Core cooling methods.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

24. Unit 2 is in a LOCA condition.

- Reactor level is -200 inches and lowering
- Reactor pressure is 450 psig and lowering
- 'B' Core Spray Injection Valve (MO-2-14-12B) is stroking when the SYSTEM II CORE SPRAY INJ VALVES OVERCURRENT (226 B-3) alarm is received

Which one of the following describes the impact of these conditions on MO-2-14-12B and the required operator actions?

MO-2-14-12B ____(1)____ continue to stroke open and the operator must ____(2)____.

A. (1) will
(2) direct an Equipment Operator to reset the thermal overload device to clear the alarm

B. (1) will
(2) hold the control switch in OPEN to reset the thermal overload device to clear the alarm

C. (1) will NOT
(2) direct an Equipment Operator to reset the thermal overload device to open the valve

D. (1) will NOT
(2) hold the control switch in OPEN to bypass the thermal overload device to open the valve

Answer Key		
Question # 24 RO		
Choice		Basis or Justification
Correct:	A	Valve motion in response to initiation and injection signals will continue despite thermal overload (TOL) device actuation. ARC contains a NOTE indicating thermal overload must be reset to clear the annunciator.
Distracters:	B	Valve motion in response to initiation and injection signals will continue despite TOL device actuation. Holding control switch will NOT reset the TOL condition. Plausible because holding the switch will BYPASS the TOL condition.
	C	Valve motion will continue; reset of TOL device is NOT required to open the valve. Plausible because TOL is bypassed by LOCA signal.
	D	Valve motion will continue; BYPASS of TOL device by holding control switch is NOT required to open the valve. Plausible because holding the control switch will in fact bypass the TOL condition, but it is NOT required since a LOCA signal accomplishes this function without operator action.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(7)

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☒ Other Exam Bank: (LORT)	
Reference(s):	ARC-226 B-3		
Learning Objective:	PLOT-5014-4h		
K/A System:	209001 – Low Pressure Core Spray System	Importance:	RO / SRO 4.2 / 4.0
K/A Statement: G2.4.50 – Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

25. Which one of the following is correct regarding SRV operation from the Alternative Shutdown Panel in the Recirc MG Set Room?

The ____(1)____ SRVs can be operated from this location and SRV position indication comes from the SRV ____(2)____.

A. (1) A, B, and K
(2) acoustic monitoring

B. (1) A, B, and K
(2) solenoid valve status

C. (1) H, E, and L
(2) acoustic monitoring

D. (1) H, E, and L
(2) solenoid valve status

Answer Key		
Question # 25 RO		
Choice		Basis or Justification
Correct:	B	The A, B, and K SRVs can be operated from the Alternative Control Station. Position indication is only by solenoid valve status.
Distracters:	A	This is incorrect because position indication is not from acoustic monitoring (as it is on the Remote Shutdown Panel), but from solenoid valve status.
	C	This is incorrect because the H, E, and L SRVs are operated from the Remote Shutdown Panel, not the Alternative Shutdown Panel.
	D	This is incorrect because the H, E, and L SRVs are operated from the Remote Shutdown Panel, not the Alternative Shutdown Panel.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY	3.25	3	10CFR55.41(b)(7)

Source Documentation		
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam: (PB 2005) ☐ Other Exam Bank: ()
Reference(s):	SE-10	
Learning Objective:	PLOT-5001A-5d, -5f	
K/A System:	239002 – Safety Relief Valves	Importance: RO / SRO 3.6 / 3.7
K/A Statement: K4.05 – Knowledge of the SRV system design feature(s) and/or interlocks which provide for the following: Allows for SRV operation from more than one location.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

26. 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
- MO-2-13-21 "RCIC TO FEED LINE" is CLOSED
- HPCI is injecting to the reactor at 1000 gpm with the flow controller in AUTO
- The PRO reports Torus level is 15' 10" 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 # 26 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.
Distracters:	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)	RO
HIGH			10CFR55.41(b)(8)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam: (PB 2008) ☐ Other Exam Bank: ()	
Reference(s):	ARC-321 C-4		
Learning Objective:	PLOT-5013-1c		
K/A System:	217000 – Reactor Core Isolation Cooling System (RCIC)	Importance:	RO / SRO 3.3 / 3.5
K/A Statement: A1.07 – Ability to predict and/or monitor changes in parameters associated with operating the Reactor Core Isolation Cooling System (RCIC) controls including: Suppression pool level.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

27. Given the following:

- Unit 2 is operating at 100% power
- The Radwaste Operator reports Floor Drain Collector Tank influent has risen over the last 4 hours
- The Drywell Floor Drain Sump flow integrator reading has risen from the previous 4-hour period

Which one of the following is correct for these conditions?

Per ST-O-020-560-2 "Reactor Coolant Leakage Test", Drywell Floor Drain Leakage is considered ____(1)____ Leakage. A possible source of the rising influent into the Drywell Floor Drain Sump is ____(2)____.

A. (1) Identified
(2) Recirc pump seal leakoff

B. (1) Unidentified
(2) Recirc pump seal leakoff

C. (1) Identified
(2) MSIV packing leak

D. (1) Unidentified
(2) MSIV packing leak

Answer Key		
Question # 27 RO		
Choice		Basis or Justification
Correct:	D	Per ST-O-020-560-2, this is considered Unidentified Leakage. MSIV packing leakage would condense on the Drywell Cooler coils, which drain to the Drywell Floor Drain Sump and ultimately end up in the Floor Drain Collector Tank.
Distracters:	A	Recirc Pump Seal leakoff is classified as IDENTIFIED LEAKAGE.
	B	Recirc Pump Seal leakoff is classified as IDENTIFIED LEAKAGE.
	C	MSIV packing leakage would condense on the Drywell Cooler coils, which drain to the Drywell Floor Drain Sump and ultimately end up in the Floor Drain Collector Tank. FDCT inputs are UNIDENTIFIED LEAKAGE.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY			10CFR55.41(b)(13)

Source Documentation		
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()
Reference(s):	M-353; M-368; ST-O-020-560-2	
Learning Objective:	PLOT-5020-1f	
K/A System:	268000 – Radwaste	Importance: RO / SRO 2.9 / 3.2
K/A Statement: K1.06 – Knowledge of the physical connections and/or cause-effect relationships between Radwaste and the following: Drywell floor drains.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

28. Unit 2 is in MODE 4 with the following conditions:

- The 2A RHR pump is lined up in Shutdown Cooling
- The 2D RHR pump is lined up to cool the Fuel Pool per AO 10.3-2 "RHR System to Fuel Pool Cross-Connect Operation"
- Breaker E-222 is closed; all other 4KV breakers are in a normal lineup
- A loss of 3 SUE occurs

Which one of the following describes the impact of this event on the RHR pumps providing Shutdown Cooling and Fuel Pool Cooling?

	2A RHR	2D RHR
A.	Tripped	Tripped
B.	Tripped	Running
C.	Running	Tripped
D.	Running	Running

Answer Key		
Question # 28 RO		
Choice		Basis or Justification
Correct:	C	Since the E-12 bus, which powers the 2A RHR pump, is normally powered from 2 SUE, there is no impact to Shutdown Cooling. A loss of 3 SUE will cause a trip of the 2D RHR pump while the E-42 bus transfers to 2 SUE. This will result in a loss of RHR-Fuel Pool Cooling.
Distracters:	A	Shutdown Cooling remains in service. With the E-22 bus powered from 2SUE (E-222 breaker closed), Panel 20Y034 remains energized on the loss of 3 SUE and therefore a loss of SDC does NOT occur due to loss of 20Y034.
	B	Shutdown Cooling remains in service; RHR-Fuel Pool Cooling is lost. With the E-22 bus powered from 2SUE (E-222 breaker closed), Panel 20Y034 remains energized on the loss of 3 SUE and therefore a loss of SDC does NOT occur due to loss of 20Y034.
	D	The 2D RHR pump trips due to a momentary loss of the E-42 bus, causing a loss of RHR-Fuel Pool Cooling.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(7)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	E-184; SO 54.7.F		
Learning Objective:	PLOT-5019-2a		
K/A System:	233000 – Fuel Pool Cooling and Clean-up	Importance:	RO / SRO 2.8 / 2.9
K/A Statement: K2.02 – Knowledge of electrical power supplies to the following: RHR pumps.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

29. Unit 2 was initially operating at 85% power with the 2A Reactor Feed Pump out of service for maintenance. The following events then occurred:

- The 2B Reactor Feed Pump tripped
- The CRS directed the URO to place the Mode Switch in SHUTDOWN
- Reactor level dropped to +5 inches before turning and beginning to rise
- The URO emergency stopped the 2C Reactor Feed Pump when level began to rise

Based on these conditions, what is the most limiting recirculation system response and the reason for that response?

The Recirculation pumps will runback to _____.

A. 30% to ensure adequate Reactor Feedwater Flow is available

B. 30% to ensure adequate Recirc Pump Net Positive Suction Head

C. 45% to ensure adequate Reactor Feedwater Flow is available

D. 45% to ensure adequate Recirc Pump Net Positive Suction Head

Answer Key		
Question # 29 RO		
Choice		Basis or Justification
Correct:	B	With a reactor scram and total feedwater flow < 20%, a 30% runback will occur to ensure adequate Recirc Pump Net Positive Head.
Distractors:	A	Runback to 30% is correct; the reason is incorrect—this is the reason for the 45% runback.
	C	Although a 45% runback will also be received, the 30% runback is more limiting. This is the correct reason for the 45% runback.
	D	Although a 45% runback will also be received, the 30% runback is more limiting.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(6)

Source Documentation		
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()
Reference(s):	OT-100; UFSAR Ch 7.9	
Learning Objective:	PLOT-5002-4b	
K/A System:	259001 – Reactor Feedwater System	Importance: RO / SRO 2.9 / 2.9
K/A Statement: K3.05 – Knowledge of the effect that a loss or malfunction of the Reactor Feedwater System will have on following: Recirculation pump NPSH.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

30. If a Group II isolation is actuated with a Traversing In-Core Probe detector in the core, the inserted detector withdraws to the ____(1)____ and the associated ____(2)____ will close.

A. (1) indexer mechanism
(2) TIP Ball Valve (SV-2-07-104) ONLY

B. (1) "in-shield" position
(2) TIP Ball Valve (SV-2-07-104) ONLY

C. (1) indexer mechanism
(2) TIP Ball Valve (SV-2-07-104) AND TIP Purge Valve (SV-2-07-109)

D. (1) "in-shield" position
(2) TIP Ball Valve (SV-2-07-104) AND TIP Purge Valve (SV-2-07-109)

Answer Key		
Question # 30 RO		
Choice		Basis or Justification
Correct:	D	If a PCIS Group II isolation signal is received while any TIP detectors are outside of their shield, the detector(s) will withdraw to the "in-shield" position and the associated ball valve will close. The isolation signal also closes the TIP purge valve.
Distractors:	A	The detector withdraws to the "in-shield" position; SV-109 also closes.
	B	SV-109 also closes.
	C	The detector withdraws to the "in-shield" position.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY			10CFR55.41(b)(9)

Source Documentation		
Source:	☐ New Exam Item ☒ Modified Bank Item ☐ ILT Exam Bank	☒ Previous NRC Exam: (PB 2007) ☐ Other Exam Bank: ()
Reference(s):	GP-8.B COL	
Learning Objective:	PLOT-5007F-1e	
K/A System:	215001 – Traversing In-Core Probe	Importance: RO / SRO 3.4 / 3.5
K/A Statement: K4.01 – Knowledge of Traversing In-Core Probe design feature(s) and/or interlocks which provide for the following: Primary containment isolation.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

31. 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 # 31 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).
Distracters:	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)	RO
MEMORY			10CFR55.41(b)(4)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam: (PB 2008) ☐ 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 2.8 / 3.1
K/A Statement: K5.02 – Knowledge of the operational implications of the following concepts as they apply to Main Turbine Generator and Auxiliaries Systems: Turbine operation and limitations.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

32. The Reactor Building Ventilation System is in a normal operating lineup when a complete loss of Instrument Air occurs.

Which one of the following describes what effect, if any, this has on the Reactor Building Ventilation system and the Standby Gas Treatment (SBGT) system?

A. No effect. The Reactor Building Ventilation system continues to operate normally and the SBGT system remains in standby.

B. The Reactor Building Ventilation system continues to operate normally. The SBGT system starts to augment ventilation of the Reactor Building spaces.

C. Reactor Building Ventilation supply dampers fail open and the exhaust dampers fail shut. Normally closed dampers fail open to align the Reactor Building exhaust to the SBGT system.

D. Normally open dampers fail closed to secure the normal Reactor Building Ventilation flowpath. Normally closed dampers fail open to align the Reactor Building exhaust to the SBGT system.

Answer Key		
Question # 32 RO		
Choice		Basis or Justification
Correct:	D	A loss of Instrument Air causes the normally open dampers to fail closed and secure the normal Reactor Building Ventilation flowpath. The normally closed dampers will fail open to align Reactor Building exhaust to the SBGT system.
Distractors:	A	RB Ventilation dampers fail to the Group III isolation alignment, configuring ventilation ducting for Standby Gas system operation.
	B	RB Ventilation dampers fail to the Group III isolation alignment, configuring ventilation ducting for Standby Gas system operation. RB Ventilation and Standby Gas Treatment are not designed for simultaneous operation.
	C	RB Ventilation dampers fail to the Group III isolation alignment, configuring ventilation ducting for Standby Gas system operation.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY	2	3	10CFR55.41(b)(9)

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	ON-119; M-388; M-397		
Learning Objective:	PLOT-5040B-6c		
K/A System:	288000 – Plant Ventilation Systems	Importance:	RO / SRO 2.7 / 2.7
K/A Statement: K6.03 – Knowledge of the effect that a loss or malfunction of the following will have on the Plant Ventilation Systems: Plant air systems.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

33. A reactor startup is in progress on Unit 3 with the following conditions present:

- Control rod 06-31 is currently at notch position '04' and has a failed reed switch
- A substitute position has been installed in the Rod Worth Minimizer (RWM)
- Control rod 06-31 is then withdrawn to notch position '08'
- A valid rod position indication ('08') is observed on the Four Rod Display

Which one of the following describes how the RWM will respond to these conditions?

The RWM will _____.

A. automatically update the rod position and display '08'

B. recognize the change in rod position and continue to display '04'

C. automatically discard the substitute rod position and display 'UNK'

D. NOT recognize the change in rod position and the display will be BLANK

Answer Key		
Question # 33 RO		
Choice		Basis or Justification
Correct:	B	The RWM will see a change in the control rod RPI and provide an operator message; substitute control rod position will continue to be displayed.
Distractors:	A	The RWM will not automatically remove the control rod substitute position.
	C	UNK is only displayed if there is no rod position information provided to the RWM; i.e., when a substitute position is not inserted and/or when RPIS input to the RWM is not available.
	D	The RWM will recognize the change in rod position (recognize the new position) but will continue to display the substituted position. The display will not be blank.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(6)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	AO 59A.2-2		
Learning Objective:	PLOT-5062A-4e		
K/A System:	201006 – Rod Worth Minimizer System (RWM)	Importance:	RO / SRO 3.2 / 3.3
K/A Statement: A1.01 – Ability to predict and/or monitor changes in parameters associated with operating the Rod Worth Minimizer System (RWM) controls including: Rod position.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

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

- Reactor level is -25 inches and lowering
- Reactor pressure is 850 psig and lowering
- Drywell pressure is 8 psig and rising
- Drywell temperature is 250 degrees F and rising
- DWCW return header pressure is 26 psig
- Drywell cooling fans are tripped
- Torus level is 19 feet and rising
- The "B" Loop of RHR is NOT available

The following actions/events occurred when the CRS directed T-204 "Initiation of Containment Sprays Using RHR":

- Keylock switch 10A-S18A "CTMT Spray Override 2/3 Core Coverage" was placed in "MANUAL OVERRD"
- SYSTEM I RHR CONTAINMENT SPRAY SELECT IN MANUAL OVERRIDE (224 D-2) alarm was NOT received
- Keylock switch 10A-S17A "CTMT Spray Vlv Cont" was placed in "MAN"

Which one of the following is correct regarding (1) containment spray logic and (2) what procedural action is allowed for these conditions?

T-223 Figure 1 "DWCW Saturation Curve" is PROVIDED ON THE NEXT PAGE.

Containment Spray logic ____(1)____ spray initiation. The above conditions allow ____(2)____.

A. (1) permits
   (2) spraying the Torus ONLY per T-204

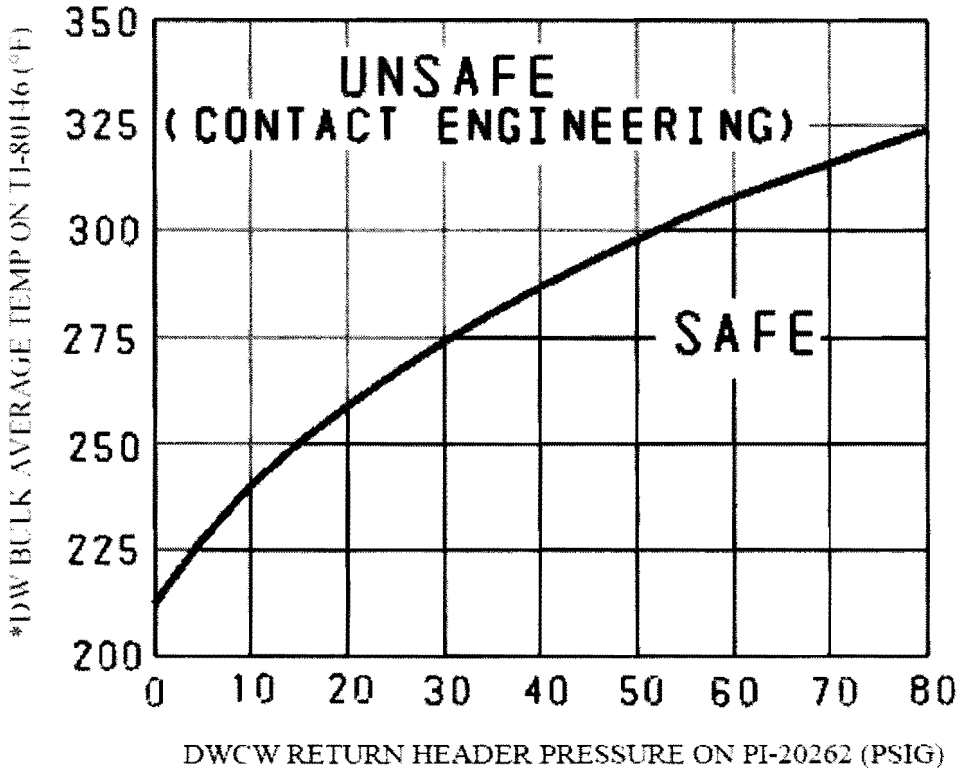
B. (1) permits
   (2) spraying the Drywell and Torus per T-204

C. (1) does NOT permit
   (2) restoring Drywell Cooling per T-223 "Drywell Cooler Fan Bypass"

D. (1) does NOT permit
   (2) spraying the containment per T-205 "Initiation of Containment Sprays using HPSW"

FIGURE 1

DRYWELL CHILLED WATER (DWCW) SATURATION CURVE



* IF TI-80146 is out of service,
THEN use RT-O-40C-530-2 to determine DW Bulk Average Temperature.

Answer Key		
Question # 34 RO		
Choice		Basis or Justification
Correct:	C	Lack of annunciator 224 D-2 indicates a logic failure – containment sprays are not permitted (cannot be initiated). Per Figure 1 of T-223, restoring Drywell Cooling fans is permitted for the current conditions.
Distractors:	A	Lack of annunciator 224 D-2 indicates a logic failure – containment sprays are not permitted. Plausible because applicant may not understand spray logic but may recognize that with torus level at 19 feet, drywell spray is not permitted due to covering the vacuum breakers (torus spray is not allowed if torus level ≥ 21 feet).
	B	Lack of annunciator 224 D-2 indicates a logic failure – containment sprays are not permitted. Plausible because applicant may not understand spray logic and may NOT recognize that with torus level at 19 feet, drywell spray is not permitted due to covering vacuum breakers (torus spray is not allowed if torus level ≥ 21 feet).
	D	Lack of annunciator 224 D-2 indicates a logic failure – containment sprays are not permitted. Use of HPSW sprays will also be blocked by the containment spray logic failure.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(7)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	ARC-224 D-2; M-1-S-65		
Learning Objective:	PLOT-5010-4s		
K/A System:	230000 – RHR/LPCI: Torus/Suppression Pool Spray Mode	Importance:	RO / SRO 3.2 / 3.3
K/A Statement: A2.12 – Ability to (a) predict the impacts of the following on the RHR/LPCI: Torus/Suppression Pool Spray Mode; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Valve logic failure.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

35. Following a steam leak in the drywell, the 'A' Loop of RHR was placed in Torus Cooling using RRC 10.1 "RHR System Torus Cooling during a Plant Event" with the following initial conditions:

- Drywell pressure was 3 psig and rising
- RPV level was -30 inches and lowering
- RPV pressure was 700 psig and lowering

Several minutes after Torus Cooling was initiated, the leak worsened and the following current conditions exist:

- Drywell pressure is 20 psig and rising
- RPV level is –110 inches and lowering
- RPV pressure is 400 psig and lowering

Based on the current conditions, which one of the following is correct regarding the Torus Cooling and LPCI valve lineups?

Torus Cooling valves ____(1)____. LPCI valves ____(2)____ for injection.

A. (1) will automatically close
(2) will automatically align

B. (1) will automatically close
(2) must be manually aligned

C. (1) must be manually closed
(2) will automatically align

D. (1) must be manually closed
(2) must be manually aligned

Answer Key		
Question # 35 RO		
Choice		Basis or Justification
Correct:	A	Both Torus Cooling valves and LPCI will align as designed since the S18 Keylock switch was not required.
Distracters:	B	RHR will align for injection with the LOCA signal.
	C	Torus Cooling valves will close. This would be true if the S18 key was used to open Torus Cooling/Spray Valves.
	D	Torus valves will auto close and LPCI will auto align with the LOCA signal.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(7)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam: (PB 2002) ☐ Other Exam Bank: ()	
Reference(s):	SO 10.7.B-2		
Learning Objective:	PLOT-5010-4a		
K/A System:	219000 – RHR/LPCI: Torus/Suppression Pool Cooling Mode	Importance:	RO / SRO 3.3 / 3.3
K/A Statement: A3.01 – Ability to monitor automatic operations of the RHR/LPCI: Torus/Suppression Pool Cooling Mode including: Valve operation.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

36. Unit 2 is operating near the End-of-Cycle with core flow at 100%.

Per ST-O-098-01D-2 "Daily Surveillance Log Mode 1, 2 or 3", which one of the following correctly describes the effect of high core flow on Control Room reactor level indication?

A. Wide Range indicates LOWER due to high flow near the Wide Range variable leg tap.

B. Wide Range indicates HIGHER due to high flow near the Wide Range variable leg tap.

C. Narrow Range indicates LOWER due to high flow near the Narrow Range variable leg tap.

D. Narrow Range indicates HIGHER due to high flow near the Narrow Range variable leg tap.

Answer Key		
Question # 36 RO		
Choice		Basis or Justification
Correct:	A	Higher flow near the variable leg tap reduces pressure on the variable leg, causing WR level indication to read lower at high core flow.
Distracters:	B	Higher flow near the variable leg tap reduces pressure on the variable leg, causing WR level indication to read lower at high core flow.
	C	Narrow range indication is not affected by increased core flow.
	D	Narrow range indication is not affected by increased core flow.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY	2	2	10CFR55.41(b)(7)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	ST-O-098-01D-2, Note on Page 9		
Learning Objective:	PLOT-5002B-5g		
K/A System:	202001 – Recirculation System	Importance:	RO / SRO 3.7 / 3.7
K/A Statement: A4.09 – Ability to manually operate and/or monitor in the control room: Reactor water level.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

37. Given the following conditions:

- Unit 2 was initially operating at 100% power when an EHC malfunction caused a Main Turbine trip
- The initiating scram signal was Reactor High Pressure
- All EOC-RPT Breakers tripped
- Both Recirc Pump Drive Motor Breakers tripped

During this transient, the Reactor Protection System ____(1)____ operate as designed, and the Recirc Flow Control system ____(2)____ operate as designed.

A. (1) did
(2) did

B. (1) did
(2) did NOT

C. (1) did NOT
(2) did

D. (1) did NOT
(2) did NOT

Answer Key		
Question # 37 RO		
Choice		Basis or Justification
Correct:	C	RPS did not operate as designed (RPS is/was not operable) since a reactor scram should have occurred on TSV/TCV closure. The Recirc/Recirc Flow Control System did operate as designed (is/was operable) since the EOC-RPT breakers functioned as designed and the Recirc pump drive motor breakers tripped as designed.
Distracters:	A	RPS did not operate as designed (RPS is/was not operable) since a reactor scram should have occurred on TSV/TCV closure.
	B	RPS did not operate as designed (RPS is/was not operable) since a reactor scram should have occurred on TSV/TCV closure. The Recirc/Recirc Flow Control System did operate as designed (is/was operable) since the EOC-RPT breakers functioned as designed and the Recirc pump drive motor breakers tripped as designed.
	D	The Recirc/Recirc Flow Control System did operate as designed (is/was operable) since the EOC-RPT breakers functioned as designed and the Recirc pump drive motor breakers tripped as designed.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(6)

Source Documentation		
Source:	☐ New Exam Item ☒ Modified Bank Item ☐ ILT Exam Bank	☒ Previous NRC Exam: (PB 2008) ☐ Other Exam Bank: ()
Reference(s):	UFSAR Chapter 7	
Learning Objective:	PLOT-5002-1bb	
K/A System	202002 – Recirculation Flow Control System	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:		

38. Unit 2 is operating at 100% power.

- The 'A' SJAE and 'A' Jet Compressor are in service
- 2 UNIT OFF GAS RECOMBINER TROUBLE (003 E-3) alarm is received
- The following indications are present at Recombiner Panel 00C196:
  - JET COMPRESSOR STEAM FLOW LOW (231 A-3) is in alarm
  - FR-4020 is indicating 7200 lbm/hr and steady
  - MO-2991A "Jet Compressor A Suction" has split (dual) indication

If this condition persists, (1) what will be the response of the Off-Gas System and (2) what action is required to return the system to service?

A. (1) MO-2990A "Jet Compressor A Steam" will close
(2) Recover the Off-Gas System using AO 8.1-2 "Recovery From Off-Gas System Isolation"

B. (1) MO-2990A "Jet Compressor A Steam" will close
(2) Swap in-service steam jet air ejectors using SO 8A.6.A-2 "Placing the Standby SJAE in Service and Placing the In-Service SJAE in Standby"

C. (1) AO-2236 A/B/C "Air Ejector Off-gas Inlet A" will close
(2) Recover the Off-Gas System using AO 8.1-2 "Recovery From Off-Gas System Isolation"

D. (1) AO-2236 A/B/C "Air Ejector Off-gas Inlet A" will close
(2) Swap in-service steam jet air ejectors using SO 8A.6.A-2 "Placing the Standby SJAE in Service and Placing the In-Service SJAE in Standby"

Answer Key		
Question # 38 RO		
Choice		Basis or Justification
Correct:	C	With jet compressor steam flow <7500 lbm/hr, MO-2-8-2991A (Jet Compressor Suction) will close after a 25-second time delay. The given conditions indicate this valve is closing. When MO-2991A is <50% open, AO-2236A-C close. AO 8.1 is written to support system recovery from isolation.
Distracters:	A	Plausible misconception. MO-2990A(B) close only on Recombiner Condenser pressure >8 psig.
	B	Plausible misconception. MO-2990A(B) close only on Recombiner Condenser pressure >8 psig.
	D	Correct valve closure; incorrect recovery procedure. A prerequisite for swapping SJAEs using SO 8A.6.A-2 is one air ejector in service per SO 8.1.A-2, which is not the case here. AO 8.1 is written to support system recovery from isolation.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(4)

Source Documentation		
Source:	☐ New Exam Item ☒ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()
Reference(s):	SO 8A.6.A-2; AO 8.1; ARC-231 A-3	
Learning Objective:	PLOT-5008-6d	
K/A System:	271000 – Offgas System	Importance: RO / SRO 2.6 / 2.8
K/A Statement: A2.09 – Ability to (a) predict the impacts of the following on the Offgas System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Valve closures.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

39. Unit 2 was operating at 100% power.

- The crew is beginning a surveillance test for full load testing of the E-4 Emergency Diesel Generator (EDG)
- The EDG is running, ready for synchronization to the E-42 Bus
- The E-42 Breaker Synch Switch is turned on with the Synch Scope rotating slowly in the fast direction

Under these conditions a complete loss of off-site power occurs.

Evaluate these conditions to assess (1) the status of the E4 EDG and the E-42 Breaker, and (2) the required procedural actions.

A. (1) E4 EDG is TRIPPED; E-42 Breaker is OPEN.
(2) Restart the EDG using SO 52A.7.A.1.B "Diesel Generator Manual Emergency Start." E-42 Breaker must be manually closed after resetting the anti-pump lockout.

B. (1) E4 EDG is TRIPPED; E-42 Breaker is OPEN.
(2) Restart the EDG using SO 52A.7.A.1.B "Diesel Generator Manual Emergency Start". E-42 Breaker will automatically close when the EDG is running.

C. (1) E4 EDG is RUNNING; E-42 Breaker is OPEN.
(2) The anti-pump lockout must be manually reset using SO 52.1.B "Diesel Generator Operations" before the E-42 Breaker will close.

D. (1) E4 EDG is RUNNING; E-42 Breaker is CLOSED.
(2) Monitor and control EDG loading during continued operation using SO 52.1.B "Diesel Generator Operations".

Answer Key		
Question # 39 RO		
Choice		Basis or Justification
Correct:	C	These conditions (dead bus start in test mode) will send a trip signal to the E-42 breaker but not to the DG. Because E-42 receives simultaneous trip and close signals from the dead bus condition, the breaker will anti-pump lockout and must be reset manually.
Distracters:	A	E-4 DG with not receive a trip signal so it does not require restart. The anti-pump lockout on the E42 breaker must be reset.
	B	E-4 DG with not receive a trip signal so it does not require restart. The anti-pump lockout on the E42 breaker must be reset.
	D	E4 DG will be running but the E-42 breaker cannot close due to anti-pump lockout.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(8)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	SO 52A.1.B		
Learning Objective:	PLOT-5052-6f		
K/A System:	295003 – Partial or Complete Loss of A.C. Power	Importance:	RO / SRO 2.6 / 2.7
K/A Statement: AK1.05 – Knowledge of the operational implications of the following concepts as they apply to Partial or Complete Loss of A.C. Power: Failsafe component design.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

40. An ATWS has occurred on Unit 2. T-117 "Level/Power Control" is in progress with the following conditions:

- Reactor Power is 15%
- Level has been lowered to -70 inches using T-240 "Terminate and Prevention of Injection Into the RPV"
- The CRS has redirected the PRO to lower level in accordance with T-240 Attachment 1 Figure 2 criteria (reproduced below)

"T-240-2, Attachment 1, FIGURE 2

IF T-117 directed that RPV level be lowered to protect Primary Containment, THEN restore RPV injection in accordance with T-117 when ANY of the following conditions exist:

- RPV level reaches -172 inches
  OR
- Reactor power drops below 4%
  OR
- All SRVs remain closed and Drywell pressure drops below 2 psig"

What is the basis for lowering Reactor level until Figure 2 criteria is met?

A. Utilize steam cooling to assure adequate core cooling and prevent exceeding 1800 degrees F clad temperature.

B. Improve Boron effectiveness in the core by lowering neutron flux into the lower core region.

C. Lower driving head which reduces natural circulation and core flow to void the core and lower core power.

D. Uncover feedwater spargers to reduce core inlet subcooling and the potential for Thermal Hydraulic Instability.

Answer Key		
Question # 40 RO		
Choice		Basis or Justification
Correct:	C	Per T-117 Bases, the reason for lowering Reactor level until Figure 2 criteria is met is to lower driving head, which reduces natural circulation and core flow to void the core and lower core power.
Distracters:	A	Core submergence here ensures ACC. Steam Cooling later if level drops below -172 inches.
	B	Boron effectiveness is improved later in T-117 when level is restored after HSBW is injected. Not the reason to lower level here.
	D	Feedwater spargers already uncovered per previous step. Per bases, there is no further effect on subcooling.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY			10CFR55.41(b)(10)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	T-117 and Bases; T-240 and Bases		
Learning Objective:	PLOT-PBIG-2117-5a		
K/A System:	295037 – SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown	Importance:	RO / SRO 4.1 / 4.3
K/A Statement: EK1.02 – Knowledge of the operational implications of the following concepts as they apply to SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown: Reactor water level effects on reactor power.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

41. Given the following:

- Reactor power is 25%
- A Main Turbine trip occurs
- Three bypass valves fail to open

Which one of the following describes the initial response of Reactor pressure and Reactor level?

Initially, reactor pressure will ____(1)____ and Reactor level will ____(2)____.

A. (1) rise
(2) rise

B. (1) rise
(2) lower

C. (1) lower
(2) rise

D. (1) lower
(2) lower

Answer Key		
Question # 41 RO		
Choice		Basis or Justification
Correct:	B	At 25% power, the reactor will NOT scram on turbine trip. With only 6 BPVs available, reactor power (25%) will exceed BPV capability (~18%), resulting in pressure rise which will compress voids and cause level to lower.
Distracters:	A	Part (1) is correct, part (2) is incorrect – see above. Plausible if candidate believes the reactor will scram and/or does not understand the fluid dynamics.
	C	Parts (1) and (2) incorrect – see above. Plausible if candidate believes the reactor will scram and/or does not understand the fluid dynamics.
	D	Part (1) is incorrect, part (2) is correct – see above. Plausible if candidate believes the reactor will scram and/or does not understand the fluid dynamics.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(1)

Source Documentation		
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()
Reference(s):	PLOT-5001B	
Learning Objective:	PLOT-5001B-3c	
K/A System:	295005 – Main Turbine Generator Trip	Importance: RO / SRO 3.5 / 3.7
K/A Statement: AK1.03 – Knowledge of the operational implications of the following concepts as they apply to Main Turbine Generator Trip: Pressure effects on reactor level.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

42. Unit 2 is operating at 100% power with the following current conditions:

- A RWCU leak exists in the Reactor Building
- Main stack radiation on RR-051B is 5.30 E-07 µCi/cc
- Vent stack radiation on RR-2979 has risen to 4.20 E-06 µCi/cc
- REAC BLDG OR REFUELING FLOOR VENT EXH HI RAD TRIP (218 D-4) was received 1 minute ago

Over the next 10 minutes, Main Stack radiation levels will ___(1)___ and Unit 2 Vent Stack radiation levels will ___(2)___.

A. (1) rise
(2) rise

B. (1) rise
(2) lower

C. (1) lower
(2) rise

D. (1) lower
(2) lower

Answer Key		
Question # 42 RO		
Choice		Basis or Justification
Correct:	B	The given conditions indicate Reactor Building Ventilation has isolated and Standby Gas initiated to re-direct Reactor Building exhaust to the Main Stack. Main Stack radiation will rise due to the immediate increase in noble gases released, and RB Vent stack radiation will lower because the gases are no longer being directed to the Vent Stack.
Distracters:	A	Main Stack will rise; Vent stack will LOWER (see above).
	B	Main Stack will rise; Vent stack will LOWER (see above).
	D	Main Stack will rise; Vent stack will LOWER (see above).

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(13)

Source Documentation		
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()
Reference(s):	ON-104 Bases	
Learning Objective:	PLOT-5040B-4a	
K/A System:	295038 – High Off-Site Release Rate	Importance: RO / SRO 3.6 / 3.8
K/A Statement: EK2.03 – Knowledge of the interrelations between High Off-Site Release Rate and the following: Plant ventilation systems.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

43. T-102 "Primary Containment Control" requires an emergency blowdown when Drywell temperature cannot be restored and maintained below 281 degrees F.

The basis for the 281 degree F temperature limitation is to prevent _____.

A. loss of reactor level indication due to reference leg flashing

B. challenging the maximum design temperature of the Primary Containment

C. loss of Drywell ventilation due to flashing water to steam in the DWCW piping

D. challenging the ability of the Primary Containment to absorb the decay heat of the reactor

Answer Key		
Question # 43 RO		
Choice		Basis or Justification
Correct:	B	Correct per T-102 Bases.
Distracters:	A	This is a MRT consideration, but not the bases for the 281 degree temperature limitation.
	C	This is a concern regarding T-223.
	D	This is a function of Torus temperature and level, and RPV pressure.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY			10CFR55.41(b)(9)

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	T-102 Bases		
Learning Objective:	PLOT-2102-6		
K/A System:	295028 – High Drywell Temperature	Importance:	RO / SRO 3.2 / 3.3
K/A Statement: EK2.02 – Knowledge of the interrelations between High Drywell Temperature and the following: Components internal to the drywell.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

44. Unit 2 is operating at 100% power when an EHC malfunction results in the following events:

- Turbine control valves swing closed then back open
- REACTOR HI PRESS (210 G-2) alarm is received
- B CHANNEL ARI TRIP (207 E-1) alarm is received
- Reactor pressure on PR/LR-96 (Panel 20C005) peaks at ~1100 psig
- Reactor power initially rose and then returned to the pre-transient level

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

A. Perform GP-4 "Manual Reactor Scram".

B. Place the Mode Switch in SHUTDOWN.

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

D. Stabilize reactor pressure below 1035 psig with EHC Pressure Set.

Answer Key		
Question # 44 RO		
Choice		Basis or Justification
Correct:	B	The given conditions indicate reactor pressure exceeded the RPS scram setpoint of 1085 psig (RPV Hi Press @ 1053 psig; ARI channel trip @ 1106 psig). The action required for an RPS failure is to initiate a manual scram using the Mode Switch.
Distractors:	A	GP-4 prerequisite is" "Plant conditions require a manual scram and sufficient time is available to perform pre-scram actions." This does not apply to an ATWS/RPS failure condition.
	C	This is the immediate operator action of OT-102 "Reactor High Pressure" but does not apply to an ATWS/RPS failure condition.
	D	This is the follow-up action of OT-102 "Reactor High Pressure" but does not apply to an ATWS/RPS failure condition.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(10)

Source Documentation		
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()
Reference(s):	ARC-207 E-1; ARC 201 G-2; OT-102	
Learning Objective:	PLOT-5060F-1b	
K/A System:	295025 – High Reactor Pressure	Importance: RO / SRO 4.1 / 4.1
K/A Statement: EK2.01 – Knowledge of the interrelations between High Reactor Pressure and the following: RPS.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

45. Unit 2 was operating at 100% power when the following alarms are received:

- REACT BLDG COOLING WATER SUPPLY HI TEMP (217 E-5)
- REACT BLDG COOLING WATER SUPPLY LO PRESS (217 F-5)

Per ON-113 "Loss of RBCCW", the CRS directs lowering power using GP-9-2 "Fast Reactor Power Reduction".

Which one of the following is the reason for performing the fast power reduction?

A. Reduce heat input to RBCCW from the RWCU System

B. Reduce heat input to RBCCW from the Recirc pumps

C. Prepare for GP-4 "Manual Reactor Scram"

D. Prepare for single-loop operation

Answer Key		
Question # 45 RO		
Choice		Basis or Justification
Correct:	B	Per ON-113, Step 2.2.3 – this action is taken if restoration of RBCCW is not imminent in order to reduce rate of temperature rise on seals and bearings, thereby reducing heat load on RBCCW.
Distracters:	A	RWCU is secured per ON-113, Step 2.2.1 and 2.2.2.
	C	GP-4 is directed by ON-113 only after both Recirc pumps are shutdown.
	D	Intentional entry into Single Loop operations is NOT directed by ON-113.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY			10CFR55.41(b)(10)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	ON-113 Bases		
Learning Objective:	PLOT-1550-18a		
K/A System:	295018 – Partial or Complete Loss of Component Cooling Water	Importance:	RO / SRO 3.3 / 3.4
K/A Statement: AK3.02 – Knowledge of the reasons for the following responses as they apply to Partial or Complete Loss of Component Cooling Water: Reactor power reduction.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

46. The following conditions exist on Unit 3:

- ATWS
- Group I isolation
- Reactor power is 40%
- Torus Cooling is NOT available

Which one of the following limits is challenged by these conditions?

A. Pressure Suppression Pressure

B. Drywell Spray Initiation Limit

C. Heat Capacity Temperature Limit

D. Primary Containment Pressure Limit

Answer Key		
Question # 46 RO		
Choice		Basis or Justification
Correct:	C	The given conditions indicate SRV discharge into the Torus with no torus cooling available. This will challenge the HCTL.
Distracters:	A	PSP is not a concern since there are no given conditions that indicate the Primary Containment is not functioning properly.
	B	DWSIL is not a concern because there are no given conditions of Primary Containment high pressure or temperature.
	D	PCP limit is not a concern because there is no given condition of Primary Containment high pressure.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(10)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☒ Other Exam Bank: (Dresden 2001)	
Reference(s):	TRIP Bases		
Learning Objective:	PLOT-2102-6		
K/A System:	295026 – Suppression Pool High Water Temperature	Importance:	RO / SRO 3.9 / 4.0
K/A Statement: EK3.02 – Knowledge of the reasons for the following responses as they apply to Suppression Pool High Water Temperature: Suppression pool cooling.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

47. Per AO 2A.1-2 "Recirculation System Single Loop Operation", indicated core flow must be corrected (calculated) IF operating Recirc Pump speed is >650 RPM AND Indicated Core Flow is >35 Mlbs/hr.

The reason for correcting Indicated Core Flow is to account for _____.

A. stall flow in the idle loop jet pumps

B. reverse flow through the idle loop jet pumps

C. forward flow through the idle loop jet pumps

D. reduced core plate differential pressure

Answer Key		
Question # 47 RO		
Choice		Basis or Justification
Correct:	B	Above 650 RPM Recirc pump speed and 35 Mlbs/hr indicated core flow, reverse flow through the idle loop jet pumps results in erroneous indicated core flow. This is accounted for by subtracting ~2 times the idle loop flow.
Distracters:	A	Stall flow occurs at or near 650 RPM Recirc pump speed.
	C	Forward flow through the idle loop jet pumps occurs below 650 RPM Recirc pump speed or 35 Mlbs/hr indicated core flow.
	D	Core plate d/p impacts Core Plate Flow (which is indicated on the same Control Room recorder), but does not impact Indicated Core Flow.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY			10CFR55.41(b)(2)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	AO 2A.1-2; GP-5		
Learning Objective:	PLOT-5002-3a		
K/A System:	295001 – Partial or Complete Loss of Forced Core Flow Circulation	Importance:	RO / SRO 2.9 / 3.0
K/A Statement: AK3.06 – Knowledge of the reasons for the following responses as they apply to Partial or Complete Loss of Forced Core Flow Circulation: Core flow indication.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

48. Unit 2 was operating in Mode 4 with Shutdown Cooling (SDC) in service when a Grid Disturbance resulted in a loss of offsite power (LOOP).

ALL Emergency Diesel Generators failed to start.

Based on these conditions, which one of the following is correct regarding the position of the Shutdown Cooling (SDC) Isolation valves?

	MO-18 (Inboard)	MO-17 (Outboard)
A.	OPEN	OPEN
B.	OPEN	CLOSED
C.	CLOSED	OPEN
D.	CLOSED	CLOSED

Answer Key		
Question # 48 RO		
Choice		Basis or Justification
Correct:	B	LOOP results in immediate PCIS Group Isolations due to loss of RPS power. Outboard Group IV (MO-17) is powered from Div II 250VDC safety related bus. Inboard Group IV (MO-18) is powered from Div I 480VAC bus E124-R-C. Only the outboard valve will close on the isolation signal.
Distracters:	A	Both valves receive isolation signal, inboard valve does not have power.
	C	Inboard valve does not have power.
	D	Inboard valve does not have power.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH	3.5	3	10CFR55.41(b)(7)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam: (PB 2002) ☐ Other Exam Bank: ()	
Reference(s):	GP-8B; COL 56E.1.A-2		
Learning Objective:	PLOT-5010-2b, -2c		
K/A System:	700000 – Generator Voltage and Electric Grid Disturbances	Importance:	RO / SRO 3.9 / 4.0
K/A Statement: AA1.05 – Ability to operate and/or monitor the following as they apply to Generator Voltage and Electric Grid Disturbances: Engineered safety features.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

49. Unit 2 is in Mode 4 with the following conditions present:

- A Loss of Shutdown Cooling occurred
- The 2B RHR pump is operating per AO 10.12-2 "Alternate Shutdown Cooling"
- The RPV is flooded up to the Main Steam Lines
- RPV pressure is being maintained at 75 psig
- HPSW flow is dead-headed through the 2B RHR heat exchanger with a flow path established through the 2D heat exchanger

HPSW flow is dead-headed through the 2B RHR heat exchanger in order to ____(1)____ cooldown rate and ensure any leakage will be from ____(2)____.

A. (1) lower
(2) HPSW TO RHR

B. (1) lower
(2) RHR TO HPSW

C. (1) raise
(2) HPSW TO RHR

D. (1) raise
(2) RHR TO HPSW

Answer Key		
Question # 49 RO		
Choice		Basis or Justification
Correct:	A	The reason for dead-heading HX is to help control CDR. Radioactive release is undesired; preference is to have river water contaminate RHR.
Distracters:	B	Reducing CDR is correct, but radioactive release is undesired, preference is to have river water contaminate RHR. Plausible if candidate believes otherwise.
	C	CDR is being REDUCED – Plausible if candidate believes otherwise.
	D	CDR is being REDUCED, radioactive release is undesired, preference is to have river water contaminate RHR. Plausible if candidate believes otherwise.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(14)

Source Documentation		
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()
Reference(s):	AO 10.12-2	
Learning Objective:	PLOT-1550-28b	
K/A System:	295021 – Loss of Shutdown Cooling	Importance: RO / SRO 3.1 / 3.1
K/A Statement: AA1.03 – Ability to operate and/or monitor the following as they apply to Loss of Shutdown Cooling: Component cooling water systems.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

50. A LOOP occurred and all 4KV buses were restored by the Emergency Diesel Generators. The transient also resulted in a fire in the 2SU Transformer with fire suppression actuation.

Which statement below is correct regarding automatic start of the fire pumps?

A. The Motor Driven Fire Pump will automatically start ONLY.

B. The Diesel Driven Fire Pump will automatically start ONLY.

C. Both the Motor Driven and Diesel Driven Fire Pumps will automatically start.

D. Neither Fire Pump will automatically start; a Fire Pump must be manually started from the Main Control Room.

Answer Key		
Question # 50 RO		
Choice		Basis or Justification
Correct:	B	The MDFP is powered from E-224. On a loss of power for >8 seconds (bus restoration following a LOOP takes >10 seconds), the MDFP auto start feature is disabled. The DDFP auto start feature is not affected.
Distracters:	A	The MDFP is powered from E-224. On a loss of power for >8 seconds (bus restoration following a LOOP takes >10 seconds), the MDFP auto start feature is disabled, requiring manual restoration.
	C	The MDFP auto start feature is disabled, requiring manual restoration.
	D	The MDFP auto start feature is disabled; the DDFP auto start feature is not affected.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY	2	2	10CFR55.41(b)(8)

Source Documentation		
Source:	☐ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☒ Other Exam Bank: (LORT)
Reference(s):	ARC-201 A-5; ARC-201 C-1, SO 37B.1.B	
Learning Objective:	PLOT-5037-4a	
K/A System:	600000 – Plant Fire On Site	Importance: RO / SRO 2.6 / 2.9
K/A Statement: AA1.08 – Ability to operate and/or monitor the following as they apply to Plant Fire On Site: Fire fighting equipment used on each class of fire.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

51. Which one of the following describes the consequences of Drywell pressure exceeding the Primary Containment Pressure Limit –A (PCPL-A) (60 psig)?

A. The Containment Hardened Vent rupture disc will rupture.

B. The structural capability of Primary Containment hatches will be challenged.

C. The ability to open and maintain open Safety Relief Valves will be challenged.

D. The structural capability of the Primary Containment downcomers will be challenged.

Answer Key		
Question # 51 RO		
Choice		Basis or Justification
Correct:	C	PCPL-A limit is based on ability to open SRVs with 85# nitrogen pressure with 25# differential pressure required across the piston.
Distracters:	A	Containment Hardened Vent rupture disc blows at 30 psig and requires opening a manual isolation valve before it will sense Containment pressure. This is a plausible distracter since the bases for the vent size is that it can pass up to 1% reactor power equivalent heat input while maintaining Primary Containment pressure below 60 psig.
	B	This is the bases for the PCPL-B limit.
	D	This limit is NOT associated with downcomer leg integrity.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY			10CFR55.41(b)(5)

Source Documentation		
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()
Reference(s):	T-102 Bases; TRIP/SAMP Curves, Tables, Limits – Bases	
Learning Objective:	PLOT-2102-4	
K/A System:	295024 – High Drywell Pressure	Importance: RO / SRO 4.2 / 4.4
K/A Statement: EA2.01 – Ability to determine and/or interpret the following as they apply to High Drywell Pressure: Drywell pressure.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

52. The Control Room has been evacuated in accordance with SE-10 "Alternative Shutdown". The following conditions exist on Unit 2:

- Reactor level (LI-2-2-3-112) is 10 inches, controlled with HPCI
- Reactor pressure is 800 psig

Which one of the following describes actual reactor level and how HPCI will respond to a high level condition?

Figure 1 of SE-10, Attachment 9 is PROVIDED ON THE NEXT PAGE.

Actual reactor level is ____(1)____ inches and on a high level condition, HPCI ____(2)____.

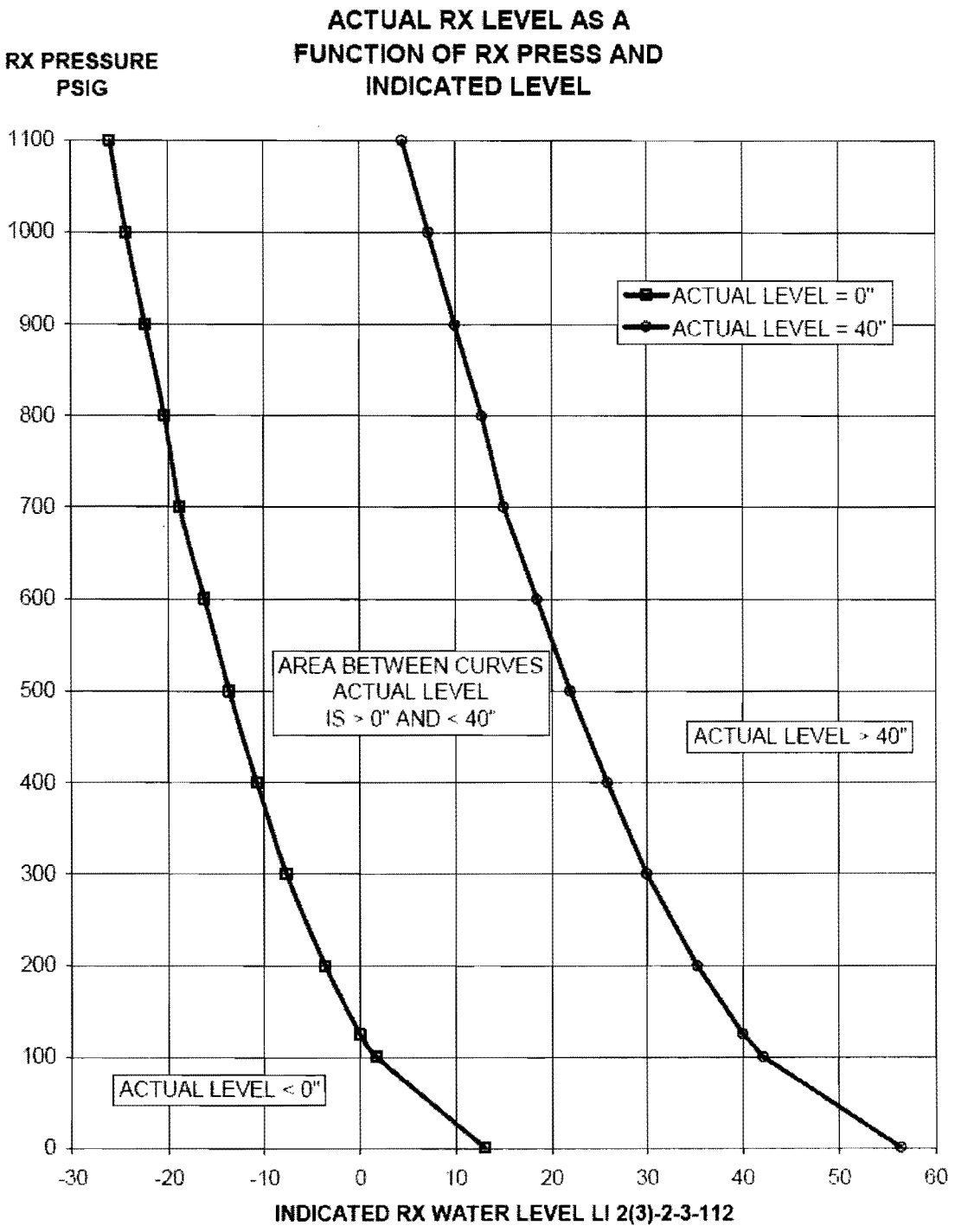
A. (1) greater than 40
(2) will AUTOMATICALLY trip

B. (1) greater than 40
(2) must be MANUALLY tripped

C. (1) between 0 and 40
(2) will AUTOMATICALLY trip

D. (1) between 0 and 40
(2) must be MANUALLY tripped

FIGURE 1


ACTUAL RX LEVEL AS A FUNCTION OF RX PRESS AND INDICATED LEVEL
RX PRESSURE PSIG
1100
1000
900
800
700
600
500
400
300
200
100
0
-30
-20
-10
0
10
20
30
40
50
60
ACTUAL LEVEL = 0"
ACTUAL LEVEL = 40"
AREA BETWEEN CURVES ACTUAL LEVEL IS > 0" AND < 40"
ACTUAL LEVEL > 40"
ACTUAL LEVEL < 0"
INDICATED RX WATER LEVEL LI 2(3)-2-3-112

Answer Key		
Question # 52 RO		
Choice		Basis or Justification
Correct:	D	Plotting 10" and 800 psig on Figure 1 indicates level is between 0" and 40" and according to SE-10 procedure cautions, all HPCI trips are bypassed.
Distracters:	A	Plotting 10" and 800 psig on Figure 1 shows that level is NOT greater than 40" and according to the procedure cautions, all HPCI trips are bypassed.
	B	Plotting 10" and 800 psig on Figure 1 shows that level is NOT greater than 40" and according to the procedure cautions all HPCI trips are bypassed.
	C	Plotting 10" and 800 psig on Figure 1 indicates level is between 0" and 40", however according to procedure cautions, all HPCI trips are bypassed.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH	2.5	4	10CFR55.41(b)(7)

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-1555-3	
K/A System:	295016 – Control Room Abandonment	Importance: RO / SRO 4.2 / 4.3
K/A Statement: AA2.02 – Ability to determine and/or interpret the following as they apply to Control Room Abandonment: Reactor water level.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

53. Unit 2 is in a refueling outage when a fuel assembly is dropped and damaged.

All Refueling Floor Area Radiation Monitors (ARMs) alarm and a PCIS Group III isolation occurs.

Ten minutes later, the following radiation readings are observed:

• All Refueling Floor ARMs:	Above alarm setpoints
• Main Stack radiation on RI-0-17-50A(B)	1.8 E 0 µCi/CC
• Vent Stack radiation on RI-2979A(B)	2.0E-7 µCi/CC
• Refueling Floor radiation on RIS-2-17-458A-D	3 mR/hr
• Refueling Floor radiation on RR-2-17-456 red pen	3 mR/hr
• Refueling Floor radiation on RR-2-17-456 black pen	3 mR/hr

Complete the following statements:

The Refueling Floor ventilation system radiation readings ___(1)___ accurate under these conditions. Per GP-8.B "PCIS Isolation – Groups II and III", the Refueling Floor ventilation system ___(2)___ be restarted.

A. (1) are
(2) may be

B. (1) are NOT
(2) may be

C. (1) are
(2) must NOT be

D. (1) are NOT
(2) must NOT be

Answer Key		
Question # 53 RO		
Choice		Basis or Justification
Correct:	D	Per the Note in GP-8.B, Section 5, the Refueling Floor ventilation system radiation readings are NOT "accurate". This is because there is no flow past the radiation monitors since the PCIS Group III isolation has tripped the Refuel Floor ventilation fans. The Refuel Floor ventilation system should NOT be restarted since high radiation conditions exist on the Refuel Floor. This is indicated by the alarming ARMs and the high Main Stack radiation readings due to SBGT exhaust.
Distracters:	A	See Above.
	B	See Above.
	C	See Above.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(11)

Source Documentation		
Source:	☐ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☒ Other Exam Bank: (LORT)
Reference(s):	GP-8.B; T-103 Bases	
Learning Objective:	PLOT-5063C-5	
K/A System:	295023 – Refueling Accidents	Importance: RO / SRO 3.6 / 4.0
K/A Statement: AA2.01 – Ability to determine and/or interpret the following as they apply to Refueling Accidents: Area radiation levels.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

54. Which one of the following Safety Limits is most at risk from a partial or complete loss of 125 VDC power?

A. Reactor Vessel Water Level, due to impact on ECCS logic power and HPCI/RCIC valve power.

B. Reactor Coolant System Pressure, due to impact on SRV solenoid power.

C. Fuel Cladding Integrity (MCPR), due to impact on Reactor Protection System power.

D. Fuel Cladding Integrity (low pressure/low flow), due to impact on Reactor Protection System power.

Answer Key		
Question # 54 RO		
Choice		Basis or Justification
Correct:	A	The RPV Level SL is protected by RPS (AC powered; fail-safe) and ECCS. Since ECCS requires DC power for logic initiation and, in the case of HPCI (RCIC) for valve actuation, a partial or complete loss of DC power has the greatest impact on this SL.
Distracters:	B	The Reactor Pressure SL is protected by RPS (AC powered; fail-safe) and SRVs. Since SRVs do not require power to actuate on high pressure, a partial or complete loss of DC power does not impact this SL.
	C	The Fuel Cladding Integrity (MCPR) SL is protected by RPS (AC powered; fail-safe). Although RPS backup protection systems (EOC-RPT, ARI) require DC power to operate, a partial or complete loss of DC power does not have the same impact on this SL as it does for RPV level.
	D	The Fuel Cladding Integrity (low pressure/low flow) SL is protected by RPS (AC powered; fail-safe). Although RPS backup protection systems (EOC-RPT, ARI) require DC power to operate, a partial or complete loss of DC power does not have the same impact on this SL as it does for RPV level.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(10)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	Tech Spec 2.0 Bases; UFSAR		
Learning Objective:	PLOT-1800-8		
K/A System:	295004 – Partial or Complete Loss of D.C. Power	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:			

55. Unit 2 was initially operating at 100% power. A LOCA resulted in the following conditions:

- The Reactor is shutdown with power at 2E-02%
- Multiple control rods failed to insert
- NO boron has been injected
- Reactor level is 10 inches and steady
- Drywell pressure is 7 psig and rising

Per T-101 "RPV Control", under these conditions RPV depressurization is _____.

A. allowed and re-criticality may occur

B. allowed and re-criticality will NOT occur

C. NOT allowed until CSBW has been injected

D. NOT allowed until all control rods are inserted

Answer Key		
Question # 55 RO		
Choice		Basis or Justification
Correct:	A	T-101, step RC/P-14 allows a cooldown under these conditions. The bases for this step discuss the possibility of re-criticality under these conditions.
Distracters:	B	Per T-101 bases, re-criticality may occur under these conditions
	C	T-101, step RC/P-14 allows a cooldown under these conditions.
	D	T-101, step RC/P-14 allows a cooldown under these conditions.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(10)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	T-101 and Bases		
Learning Objective:	PLOT-2101-5a		
K/A System:	295006 – SCRAM	Importance:	RO / SRO 3.8 / 4.2
K/A Statement: G2.4.9 – Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

56. Unit 2 is operating at 100% power with the following conditions present:

- SCRAM VALVE PILOT AIR HEADER PRESS HI-LOW (211 D-2) is received
- Instrument Air Header pressure is 110 psig and steady
- Scram Air Header pressure is 65 psig and steady

Which one of the following indicates (1) the cause of this alarm and (2) the correct course of action per ARC 211 D-2?

A. (1) Low Scram Air Header pressure
(2) Enter ON-108 "Low CRD Scram Air Header Pressure"

B. (1) Low Scram Air Header pressure
(2) Enter ON-119 "Loss of Instrument Air"

C. (1) High Scram Air Header pressure
(2) Adjust the in-service pressure control valve

D. (1) High Scram Air Header pressure
(2) Swap to the standby pressure control valve

Answer Key		
Question # 56 RO		
Choice		Basis or Justification
Correct:	A	Per ARC 211 D-2, the low alarm setpoint is 65 psig. A low pressure condition requires entry into ON-108.
Distracters:	B	Since Instrument air header pressure is normal, and scram air header pressure is low, entry into ON-108 is required. There are no entry conditions given for entry into ON-119.
	C	This is an appropriate action from ARC 211 D-2 for a high pressure condition.
	D	This is an appropriate action from ARC 211 D-2 for a high pressure condition.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(10)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	ARC-211 D-2		
Learning Objective:	PLOT-1550-22a		
K/A System:	295019 – Partial or Complete Loss of Instrument Air	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:			

57. The following conditions exist on Unit 3:

- An ATWS is in progress
- T-116 "RPV Flooding" was entered due to unknown RPV level and:
  - Only 4 SRVs could be opened during the T-116 blowdown
  - Minimum Steam Cooling Pressure is 340 psig

Which of the following systems will inject into the RPV to maintain Minimum Steam Cooling Pressure?

1. Condensate
2. Core Spray
3. LPCI

A. 1

B. Both 1 and 2

C. Both 1 and 3

D. All three systems

Answer Key		
Question # 57 RO		
Choice		Basis or Justification
Correct:	A	Condensate pump shutoff head is ~650 psig; it is the only injection source that can maintain RPV pressure above a MSCP of 340 psig.
Distracters:	B	Core Spray pump shutoff head is ~330 psig, which is insufficient to maintain RPV pressure above a MSCP pressure of 340 psig. This choice may be selected if the applicant does not recall CS pump shutoff head.
	C	RHR pump shutoff head is ~305 psig, which is insufficient to maintain RPV pressure above a MSCP pressure of 340 psig. This choice may be selected if the applicant does not recall RHR pump shutoff head.
	D	The shutoff head of Core Spray pumps (330 psig) and RHR pumps (305 psig) is insufficient to maintain RPV pressure above a MSCP pressure of 340 psig. This choice may be selected if the applicant does not recall CS and RHR pumps shutoff head.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY	2	3	10CFR55.41(b)(10)

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-116 and Bases		
Learning Objective:	PLOT-2116-6		
K/A System:	295031 – Reactor Low Water Level	Importance:	RO / SRO 4.2 / 4.2
K/A Statement: EA2.03 – Ability to determine and/or interpret the following as they apply to Reactor Low Water Level: Reactor pressure.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

58. The following conditions exist after a LOCA on Unit 3:

- Torus level lowered to 12 feet and stabilized
- Torus temperature is 200 degrees F and steady
- Torus pressure is 8 psig and steady
- 'A' RHR loop flow is 22,000 gpm
- 'B' Core Spray loop flow is 6,000 gpm
- No other ECCS pumps are running

Based on the current conditions, which of the following systems, if any, has sufficient NPSH for continued pump operation?

Sheet 3 of T-102 "Primary Containment Control" is PROVIDED SEPARATELY.

A. 'A' loop of RHR

B. 'B' loop of Core Spray

C. Both 'A' loop of RHR AND 'B' loop of Core Spray

D. Neither 'A' loop of RHR NOR 'B' loop of Core Spray

Answer Key		
Question # 58 RO		
Choice		Basis or Justification
Correct:	B	Correct per T-103 NPSH curves.
Distracters:	A	RHR is operating in the unsafe region of the curve. Core Spray is operating in the safe region.
	C	RHR is operating in the unsafe region of the curve. Core Spray is operating in the safe region.
	D	RHR is operating in the unsafe region of the curve. Core Spray is operating in the safe region.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(14)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	T-102, Sheet 3		
Learning Objective:	PLOT-PBIG-2102-1		
K/A System:	295030 – Low Suppression Pool Water Level	Importance:	RO / SRO 3.6 / 3.8
K/A Statement: EA1.01 – Ability to operate and/or monitor the following as they apply to Low Suppression Pool Water Level: ECCS systems (NPSH considerations).			
REQUIRED MATERIALS:	**T-102 Sheet 3**		
Notes and Comments:			

59. A LOCA on Unit 2 resulted in the following conditions:

- Drywell bulk average temperature is 250 degrees F and rising
- Drywell pressure is 5 psig and rising
- Torus pressure is 4 psig and rising

Which one of the following is correct regarding the use of Drywell sprays?

The "Drywell Spray Initiation Limit (DWSIL)" curve is PROVIDED ON THE NEXT PAGE.

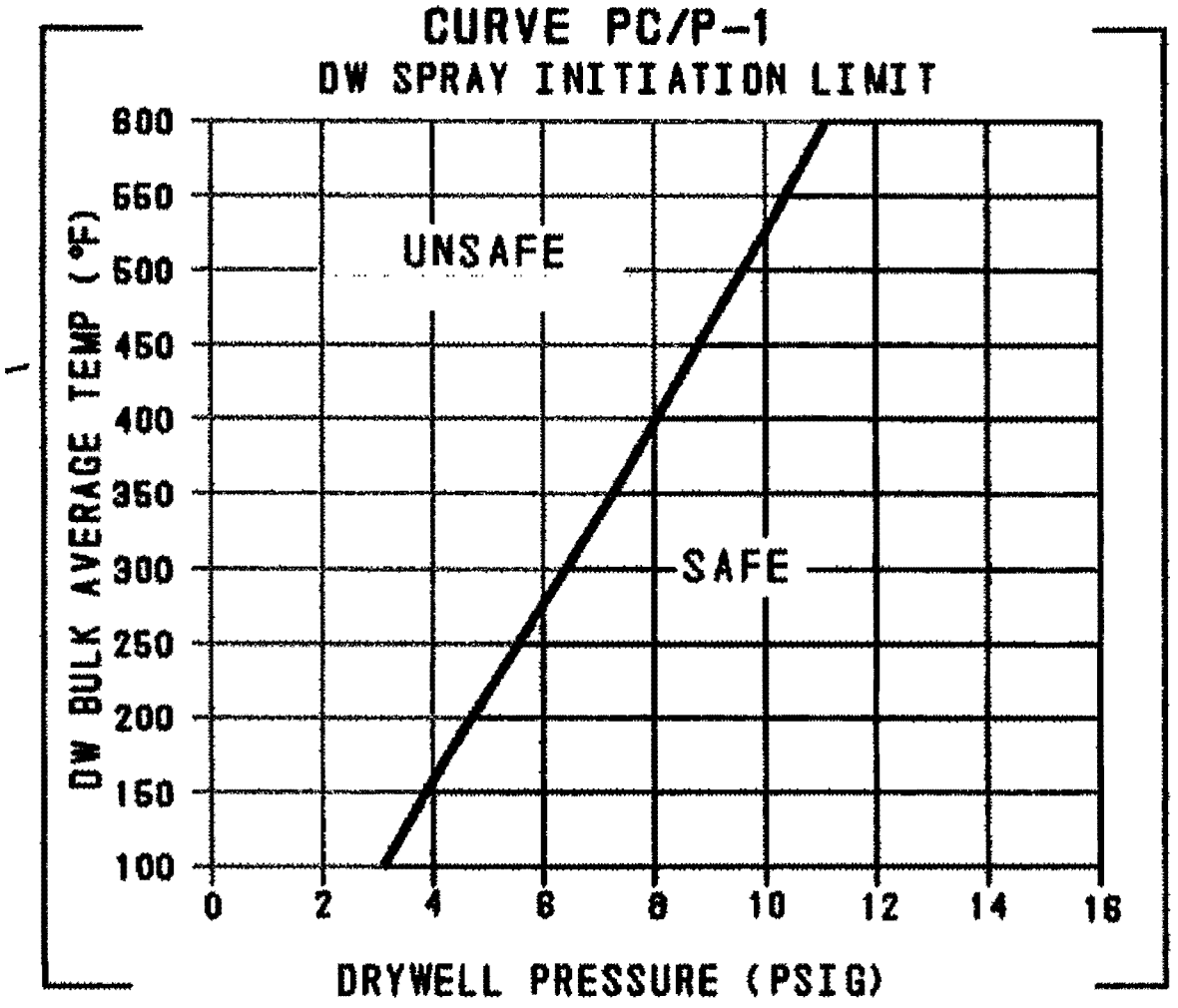
Initiation of Drywell sprays is _____.

A. allowed and will reduce Drywell pressure ONLY

B. allowed and will reduce Drywell AND Torus pressure

C. NOT allowed because it would result in an evaporative cooling pressure drop to below the high Drywell pressure scram setpoint

D. NOT allowed because it would result in an evaporative cooling pressure drop greater than the capacity of the Reactor Building-to-Torus vacuum breakers


CURVE PC/P-1
DW SPRAY INITIATION LIMIT
UNSAFE
SAFE
DW BULK AVERAGE TEMP (°F)
600
550
500
450
400
350
300
250
200
150
100
0
2
4
6
8
10
12
14
16
DRYWELL PRESSURE (PSIG)

Answer Key		
Question # 59 RO		
Choice		Basis or Justification
Correct:	C	Drywell temperature and pressure plot on the unsafe side of the DWSIL curve, which is based on avoiding an evaporative cooling pressure drop to the drywell high pressure scram setpoint of 2 psig.
Distracters:	A	Spray is not permitted due to DWSIL curve limitation. If/when sprays are initiated they will reduce drywell and torus pressure as long as the containment is functioning properly.
	B	Spray is not permitted due to DWSIL curve limitation. If/when sprays are initiated they will reduce drywell and torus pressure as long as the containment is functioning properly.
	D	While spray is unacceptable, the bases for DWSIL is NOT Torus-to-Drywell vacuum breaker capacity.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(10)

Source Documentation		
Source:	☐ New Exam Item ☒ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()
Reference(s):	T-102 Bases	
Learning Objective:	PLOT-PBIG-2102-1	
K/A System:	295012 – High Drywell Temperature	Importance: RO / SRO 3.3 / 3.5
K/A Statement: AK1.01 – Knowledge of the operational implications of the following concepts as they apply to High Drywell Temperature: Pressure/temperature relationship.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

60. Unit 2 was initially operating at 100% power when Wide Range level transmitter LT-72B failed low.

Which one of the following describes the impact of this event on the associated controls and indications?

A. RPV Shroud Level Indicator (LI-91) on Panel 20C003 will display a downscale value.

B. Associated ECCS logic initiation permissives would NOT be met on an actual low level condition.

C. RHR System 2/3 Core Coverage Containment Spray permissive would NOT be met on an actual low level condition.

D. RPV Shroud Level Indicator (LI-91) on Panel 20C003 will display the output of RPV Fuel Zone Level Transmitter LT-73B.

Answer Key		
Question # 60 RO		
Choice		Basis or Justification
Correct:	D	Wide Range displays from -165 to +60 inches. LI-91 input swaps from LT-72B to LT-73B (Fuel Zone) when LT-72B senses -100 inches RPV level. Since LT-72B is failed low, LI-91 will display Fuel Zone level indication.
Distracters:	A	With LI-72B failed low (below -100 inches), LI-91 is displaying Fuel Zone (LT-73B) level.
	B	A single level transmitter failure will not prevent ECCS initiation (single failure criteria).
	C	RHR System 2/3 Core Coverage Containment Spray permissive, which occurs at -226 inches, cannot come from Wide Range since -165 inches is the low end of the instrument band.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(7)

Source Documentation		
Source:	☐ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☒ Other Exam Bank: (LORT)
Reference(s):	PLOT-5002B	
Learning Objective:	PLOT-5002B-5a	
K/A System:	295009 – Low Reactor Water Level	Importance: RO / SRO 3.9 / 4.0
K/A Statement: AK2.01 – Knowledge of the interrelations between Low Reactor Water Level and the following: Reactor water level indication.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

61. Complete the following statement:

During an inadvertent control rod withdrawal with power above 30%, the Rod Block Monitor (RBM) will generate rod blocks to prevent exceeding the ____(1)____ limit due to high ____(2)____ power.

A. (1) LHGR
(2) localized

B. (1) LHGR
(2) core average

C. (1) MCPR
(2) localized

D. (1) MCPR
(2) core average

Answer Key		
Question # 61 RO		
Choice		Basis or Justification
Correct:	C	Per the UFSAR Chapter 14 (and Tech Spec Bases), this is the reason for RBM-generated control rod blocks.
Distracters:	A	Per the UFSAR, the RBM protects the MCPR safety limit during localized power transients.
	B	Per the UFSAR, the RBM protects the MCPR safety limit during localized power transients.
	D	Per the UFSAR, the RBM protects the MCPR safety limit during localized power transients.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY	3.5	2	10CFR55.41(b)(6)

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	UFSAR Chapter 14; Tech Spec Bases 3.3.2.1		
Learning Objective:	PLOT-5060-1a		
K/A System:	295014 – Inadvertent Reactivity Addition	Importance:	RO / SRO 3.7 / 3.7
K/A Statement: AK3.02 – Knowledge of the reasons for the following responses as they apply to Inadvertent Reactivity Addition: Control rod blocks.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

62. A small-break LOCA occurred on Unit 2, resulting in the following conditions:

- Drywell pressure is 18 psig and rising
- Drywell temperature is 225 degrees F and rising
- DWCW Return Header pressure (locally) is 28 psig
- RBCCW pressure (PI-2350) on Panel 20C012 is 40 psig
- The PRO was directed to perform T-223 "Drywell Cooler Fan Bypass"

Per GP-8.B "PCIS Isolations – Group II and III", what source of cooling water, if any, will supply the Drywell Cooling Fan Units under these conditions?

A. Drywell Chilled Water ONLY

B. Reactor Building Closed Cooling Water ONLY

C. Drywell Chilled Water OR Reactor Building Closed Cooling Water

D. Cooling water must be isolated; the fans will run for recirculation only

Answer Key		
Question # 62 RO		
Choice		Basis or Justification
Correct:	A	Based on the given conditions, DWCW is available and is not required to be isolated. In addition, based on Drywell temperature and DWCW return header pressure, operation is on the safe side of the DWCW saturation curve. T-223 allows use of either DWCW or RBCCW.
Distracters:	B	RBCCW pressure is abnormally low, which requires isolating RBCCW to Drywell loads per GP-8.B.
	C	RBCCW pressure is abnormally low, which requires isolating RBCCW to Drywell loads per GP-8.B.
	D	A prerequisite for T-223 is cooling water must be available (i.e., not isolated).

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(10)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	T-223 and Bases; GP-8.B		
Learning Objective:	PLOT-504C-4c		
K/A System:	295010 – High Drywell Pressure	Importance:	RO / SRO 3.4 / 3.5
K/A Statement: AA1.01 – Ability to operate and/or monitor the following as they apply to High Drywell Pressure: Drywell ventilation/cooling.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

63. T-103 "Secondary Containment Control" was entered on Unit 3 after the HPCI PUMP ROOM FLOOD (221 A-5) alarm was received.

Which one of the following can be used to determine if water level is at or above the T-103 Action Level without physically entering the room?

A. If both Reactor Building floor drain sump pumps are running.

B. By computer point verification of ECCS room levels on SPDS.

C. If the Reactor Building floor drain sump high-high level alarm is received.

D. By observing water level in stairwells with adjoining, non-watertight doors.

Answer Key		
Question # 63 RO		
Choice		Basis or Justification
Correct:	D	Per T-103 Bases, and Note #36, this is a method to confirm water level above the Action Level in a particular RB area.
Distracters:	A	This is not a method provided by T-103 to confirm water level above the Action Level in a particular RB area.
	B	SPDS does not provide room level indication; alarm only. In addition, SPDS cannot be used to validate TRIP action levels.
	C	This indicates drainage to the sump exceeds the capacity of the sump pumps but is not a method provided by T-103 to confirm water level above the Action Level in a particular RB area.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY			10CFR55.41(b)(10)

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	T-103 and Bases (NOTE #36)		
Learning Objective:	PLOT-PBIG-2103-6		
K/A System:	295036 – Secondary Containment High Sump/Area Water Level	Importance:	RO / SRO 3.4 / 3.8
K/A Statement: EA2.03 – Ability to determine and/or interpret the following as they apply to Secondary Containment High Sump/Area Water Level: Cause of the high water level.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

64. The following conditions exist on Unit 2:

- 2 VENT EXH STACK RAD MONITOR HI A (218 B-5) is in alarm
- 2 VENT EXH STACK RAD MONITOR HI B (218 C-5) is in alarm
- ON-104 "Vent Stack High Radiation" has been entered
- Equipment Cell Exhaust has been placed on Standby Gas Treatment
- Reactor Zone Vent Exhaust is reading above normal but NOT in alarm
- A steam leak has been discovered in the Reactor Building, but there are NO ARMs in alarm

The following alarms have just been received:

- 2 VENT EXH STACK RAD MONITOR HI-HI A (218 B-4)
- 2 VENT EXH STACK RAD MONITOR HI-HI B (218 C-4)

Which one of the following actions is correct for these conditions?

A. Exit ON-104 and enter T-103 "Secondary Containment Control".

B. Exit ON-104 and enter T-104 "Radioactivity Release Control".

C. Continue in ON-104 and enter T-103 "Secondary Containment Control" concurrently.

D. Continue in ON-104 and enter T-104 "Radioactivity Release Control" concurrently.

Answer Key		
Question # 64 RO		
Choice		Basis or Justification
Correct:	D	Vent Stack Rad Hi-Hi is a T-104 entry condition. In addition, on a Hi-Hi radiation condition, ON-104 directs T-104 entry and concurrent execution.
Distracters:	A	There are no T-103 entry conditions.
	B	On a Hi-Hi radiation condition, ON-104 directs T-104 entry and concurrent execution.
	C	There are no T-103 entry conditions.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY	2	2	10CFR55.41(b)(11)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	ON-104; T-104		
Learning Objective:	PLOT-2104-1		
K/A System:	295017 – High Off-Site Release Rate	Importance:	RO / SRO 4.6 / 4.8
K/A Statement: G2.4.1 – Knowledge of EOP entry conditions and immediate action steps.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

65. Which one of the following describes the reason for a reactor scram that occurs as a result of a Main Turbine trip?

A. Limits positive reactivity due to reduced void concentration when turbine stop valves close.

B. Minimizes the level transient that occurs when feed pumps swap to high pressure steam.

C. Limits positive reactivity due to increased feedwater sub-cooling when extraction steam is lost.

D. Minimizes the level transient that occurs when voids collapse due to turbine control valves closing.

Answer Key		
Question # 65 RO		
Choice		Basis or Justification
Correct:	A	Void concentration will rapidly decrease on closing of the turbine steam admission valves, resulting in a large positive reactivity addition.
Distracters:	B	While the reactor feed pumps do swap from cross-around (LP) steam to main steam (HP) and this does contribute to the post-scram level transient that will occur, it is not part of the basis for the scram.
	C	While this will occur, the reactor power rise will be slight and gradual. This is not the reason for the scram.
	D	While this level transient will occur, it is not part of the basis for the scram.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY	2.5	2	10CFR55.41(b)(14)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☒ Other Exam Bank: (LGS 2006)	
Reference(s):	OT-102; UFSAR Chapter 14		
Learning Objective:	PLOT-1540-1		
K/A System:	295007 – High Reactor Pressure	Importance:	RO / SRO 3.8 / 3.8
K/A Statement: AK2.02 – Knowledge of the interrelations between High Reactor Pressure and the following: Reactor power.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

66. A transient on Unit 2 resulted in the following conditions:

- Drywell pressure on PR-2508 is 25 psig
- Containment venting is required using T-200-2 "Primary Containment Venting"
- Chemistry determined that the maximum Containment vent rate that will not exceed the General Emergency release rate is 9,000 scfm
- Standby Gas Treatment is available

Using Figure 1 of T-200-2, PROVIDED ON THE NEXT PAGE, determine which one of the following vent paths will most quickly remove the combustible gases without exceeding the General Emergency release rate.

A. 2 inch hard vent to SBGTS

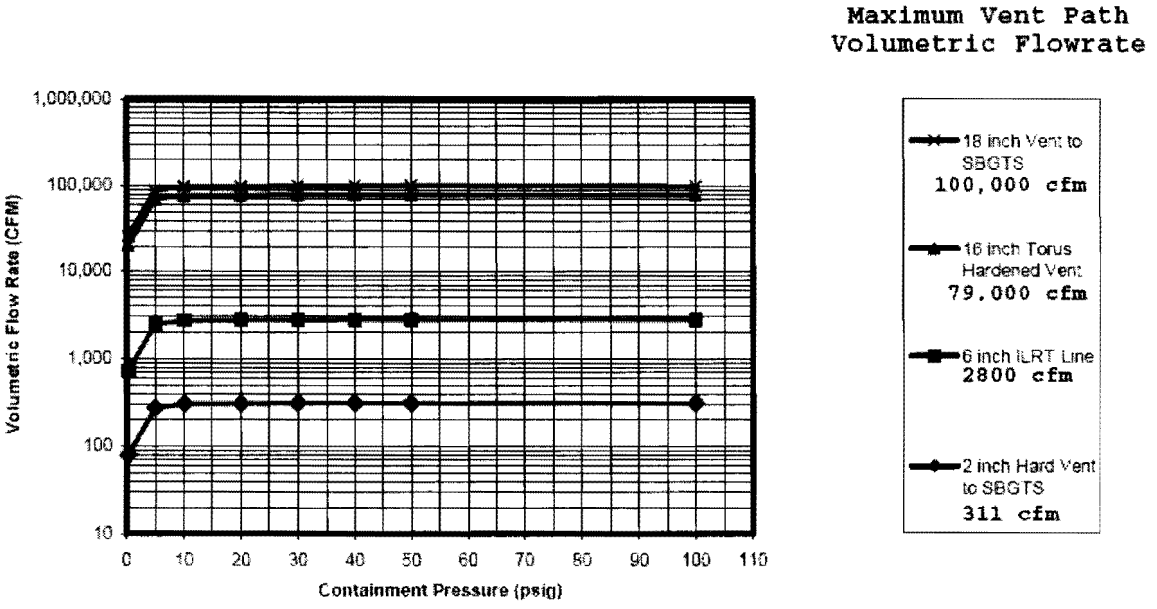
B. 6 inch ILRT line

C. 16 inch Torus Hardened Vent

D. 18 inch vent to SBGTS

FIGURE 1

MAXIMUM PRIMARY CONTAINMENT VENT RATE FOR VARIOUS VENT PATH SIZES



Answer Key		
Question # 66 RO		
Choice		Basis or Justification
Correct:	B	Plot Containment pressure of 25 psig and vent rate of 9000 SFCM, the point is ABOVE the 6 in ILRT Line and BELOW the 16 inch Torus Vent; the ILRT line is the largest vent path that will NOT exceed the GE release rate.
Distracters:	A	While the 2 inch vent path is viable, the direction is to determine the path which will MOST QUICKLY remove the combustible gases.
	C	Plot Containment pressure of 25 psig and vent rate of 9000 SFCM, the point is ABOVE the 6 in ILRT Line and BELOW the 16 inch Torus Vent; the ILRT line is the largest vent path that will NOT exceed the GE release rate.
	D	Plot Containment pressure of 25 psig and vent rate of 9000 SFCM, the point is ABOVE the 6 in ILRT Line and BELOW the 16 inch Torus Vent; the ILRT line is the largest vent path that will NOT exceed the GE release rate.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(10)

Source Documentation		
Source:	☐ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☒ Other Exam Bank: (LORT)
Reference(s):	T-102 and Bases	
Learning Objective:	PLOT-PBIG-2100-3	
K/A System:	G2.1 – Conduct of Operations	Importance: RO / SRO 3.9 / 4.2
K/A Statement: G2.1.25 – Ability to interpret reference materials, such as graphs, curves, tables, etc.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

67. Unit 2 was operating at 90% power when the CRS directed the EHC Pressure Regulators swapped from "A in Control" to "B in Control".

This task is accomplished by adjusting the _____(1)_____, which is located at _____(2)_____.

A. (1) Pressure Setpoint Selector
(2) EHC Control Cabinet 20C030

B. (1) Pressure Setpoint Selector
(2) Turbine Control Panel C008A

C. (1) Pressure Setpoint Bias Potentiometer
(2) EHC Control Cabinet 20C030

D. (1) Pressure Setpoint Bias Potentiometer
(2) Turbine Control Panel C008A

Answer Key		
Question # 67 RO		
Choice		Basis or Justification
Correct:	C	The regulator swap is done by adjusting the Pressure Setpoint Bias Potentiometer on Panel 20C030 in the Cable Spreading Room.
Distracters:	A	The Pressure Setpoint Selector is located on Panel C008A in the Main Control Room and is used to adjust EHC the setpoint at which EHC controls turbine inlet/reactor pressure.
	B	The Pressure Setpoint Selector is located on Panel C008A in the Main Control Room and is used to adjust EHC the setpoint at which EHC controls turbine inlet/reactor pressure.
	D	The Pressure Setpoint Selector is located on Panel C008A in the Main Control Room and is used to adjust EHC the setpoint at which EHC controls turbine inlet/reactor pressure.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY	2.25	3	10CFR55.41(b)(6)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	AO 1D.1-2		
Learning Objective:	PLOT-5001DL-4a		
K/A System:	G2.1 – Conduct of Operations	Importance:	RO / SRO 4.4 / 4.0
K/A Statement: G2.1.30 – Ability to locate and operate components, including local controls.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

68. Unit 3 is in Mode 1 and a clearance is to be applied to remove the HPCI Flow Controller from service for repair.

The controller needs to be placed in MANUAL prior to attaching the clearance tag.

According to HU-AA-101 "Human Performance Tools and Verification Practices", which one of the following is required to place the controller in manual?

A. Independent Verification

B. Concurrent Verification

C. First Check

D. Peer Check

Answer Key		
Question # 68 RO		
Choice		Basis or Justification
Correct:	D	Per HU-AA-101, peer checks are required for all MCR manipulations which do not require CV or IV, except during transients and/or special exceptions approved in advance
Distracters:	A	Not required – HU-AA-101 states IVs are required for safety related equipment when the equipment's function is required in the current mode of operation. Plausible because HPCI is Safety-related, but in this case it is being removed from service, NOT returned to service.
	B	Not required – HU-AA-101 states CVs are required if it is impossible to verify the component AFTER the initial manipulation – such as throttling a valve, OR if the action would cause an immediate irrecoverable condition if performed incorrectly that would result in a threat to safe and reliable plant operation. Plausible because this is a valid verification technique, and it could be specified by supervision but the stem does not state this is the case.
	C	Not required – Per HU-AA-101, First Check is used for in-field evolutions. Plausible because this is a valid verification technique.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY			10CFR55.41(b)(10)

Source Documentation		
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()
Reference(s):	HU-AA-101	
Learning Objective:	PLOT-DBIG-1570-22	
K/A System:	G2.2 – Equipment Control	Importance: RO / SRO 3.9 / 4.3
K/A Statement: G2.2.14 – Knowledge of the process for controlling equipment configuration or status.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

69. MA-MA-716-004-1000 "Troubleshooting, Rework, and Testing Control Manual for Peach Bottom and Limerick" must be used for which one of the following situations?

A. System Engineer lifting leads in the HPCI control panel to verify controller response.

B. Utility Shift Reactor Operator visually checking the number of SRV cycles in Panel 20C722 in the Cable Spreading Room.

C. EHC System Engineer requests placing the Standby EHC pump in service using the operating procedure to monitor filter differential pressure.

D. Computer Engineer performing system diagnostics on the Plant Monitoring System in the Administration Building, 4th Floor, PMS Computer Room.

Answer Key		
Question # 69 RO		
Choice		Basis or Justification
Correct:	A	Per step 2.4.1 of MA-MA-716-004-1000, lifting leads is an activity covered by this procedure.
Distracters:	B	Per step 4.1.1 of MA-MA-716-004-1000, visual observation does not require use of this procedure (but does require permission from Shift Management).
	C	Per step 1.4.2 of MA-MA-716-004-1000, this procedure is not used when an approved procedure could be used to cover the activity.
	D	Per step 1.1 of MA-MA-716-004-1000, this procedure applies to plant equipment; the PMS computers in the Admin Building are not considered plant equipment.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY			10CFR55.41(b)(10)

Source Documentation		
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()
Reference(s):	MA-MA-716-004-1000	
Learning Objective:	PLOT-1570-15	
K/A System:	G2.2 – Equipment Control	Importance: RO / SRO 2.9 / 3.6
K/A Statement: G2.2.7 – Knowledge of the process for conducting special or infrequent tests.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

70. The following conditions exist on Unit 3:

- A transient occurred resulting in significant fuel damage
- The Reactor Building has become a High Radiation Area (General Area dose rates of 120 mR/hr) and has no current valid Radiation Work Permit (RWP)
- Operations personnel must enter the Reactor Building for one hour to help mitigate the transient and save plant equipment
- No dose extensions are required

In accordance with RP-AA-403 "Administration of the Radiation Work Permit Program", the MINIMUM requirement for an operator to enter the area is that they must have _____.

A. coverage by a qualified Advanced Rad Worker (ARW)

B. permission from the Radiation Protection Manager (RPM)

C. coverage by a qualified Radiation Protection Technician (RPT)

D. permission from the Emergency Director (ED) after Emergency Plan activation

Answer Key		
Question # 70 RO		
Choice		Basis or Justification
Correct:	C	Section 4.4 of RP-AA-403 states: "If authorization is given for entry without an RWP, then provide RP coverage, as required, to meet the objectives of the RWP program."
Distracters:	A	An ARW qualified individual is NOT sufficient to provide the required coverage.
	B	The procedure requires the RPT to notify RP Management as soon as possible, but their permission is not required for entry.
	D	The ED's permission is not required unless a dose extension is required for entry into the High Radiation Area.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY	3.0	4	10CFR55.41(b)(12)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	RP-AA-403; RP-AA-460		
Learning Objective:	PLOT-1760-4		
K/A System:	G2.3 – Radiation Control	Importance:	RO / SRO 3.5 / 3.6
K/A Statement: G2.3.7 – Ability to comply with radiation work permit requirements during normal or abnormal conditions.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

71. During a declared emergency, an Equipment Operator (EO) must enter an area of the Reactor Building to locate and isolate a leak. The general area radiation level is 3 Rem/hr.

The EO, age 38, has the following radiation history:

- 1760 mRem cumulative exposure for the current year (TEDE)
- 19 Rem lifetime exposure to this date (TEDE)
- No dose extensions have been obtained
- NRC form 4 completed and on file

The EO has been given 45 minutes to complete the task.

Which one of the following radiation exposure limits, if any, would be exceeded if the EO performs this task?

A. No exposure limits would be exceeded

B. Administrative Dose Control Level

C. Administrative Dose Control Level AND NRC Exposure Limit

D. Administrative Dose Control Level, AND NRC Exposure Limit, AND Emergency Exposure Limit

Answer Key		
Question # 71 RO		
Choice		Basis or Justification
Correct:	B	3 Rem = 3000 mRem 3000 mRem X .75 = 2250 mRem 2250 mRem + 1760 mRem = 4010 mRem 4010 mRem exceeds 2000 mRem TEDE Admin Dose Control Level.
Distracters:	A	Admin Dose Control Level is exceeded.
	C	4010 mRem < NRC Limit of 5000 mRem.
	D	4010 mRem < NRC Limit of 5000 mRem. 4010 mRem < Emergency Exposure Limit of 10,000 mRem for protecting station property.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH	3.0	4	10CFR55.41(b)(12)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	RP-AA-203		
Learning Objective:	PLOT-1730-4		
K/A System:	G2.3 – Radiation Control	Importance:	RO / SRO 3.2 / 3.7
K/A Statement: G2.3.4 – Knowledge of radiation exposure limits under normal or emergency conditions.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

72. Which one of the following sets of conditions meets the requirement for the RPV to be considered "depressurized" per T-112 "Emergency Blowdown"?

	RPV Pressure	Torus Pressure
A.	125 psig	10 psig
B.	105 psig	25 psig
C.	95 psig	30 psig
D.	95 psig	5 psig

Answer Key		
Question # 72 RO		
Choice		Basis or Justification
Correct:	C	Depressurized is defined as reactor pressure to torus d/p ≤ 75 psid. d/p = 65 psid
Distracters:	A	d/p = 115 psid
	B	d/p = 80 psid
	D	d/p = 90 psid

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH	2		10CFR55.41(b)(10)

Source Documentation		
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()
Reference(s):	T-112 and Bases	
Learning Objective:	PLOT-PBIG-2112-4	
K/A System:	G2.4 – Emergency Procedures/Plan	Importance: RO / SRO 3.9 / 4.3
K/A Statement: G2.4.17 – Knowledge of EOP terms and definitions.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

73. A Security Event occurred at Peach Bottom that requires implementation of the Emergency Plan.

What is the lowest classification level at which the Shift Communicator (RO) will be required to activate the Call Out System in accordance with EP-AA-112-100-F-07 "Mid-Atlantic ERO Notification or Augmentation"?

A. Unusual Event

B. Alert

C. Site Area Emergency

D. General Emergency

Answer Key		
Question # 73 RO		
Choice		Basis or Justification
Correct:	A	For security events, the ERO is required to be activated at the UE level.
Distractors:	B	For non-security events, the ERO is normally activated at the Alert level, but may be activated earlier if the Shift Manager determines additional facility staffing is required.
	C	This is not the lowest classification level when the ERO must be activated.
	D	This is not the lowest classification level when the ERO must be activated.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY			10CFR55.41(b)(10)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	EP-AA-112-100-F-07; EP-AA-112-100-F-01		
Learning Objective:	G5-12		
K/A System:	G2.4 – Emergency Procedures/Plan	Importance:	RO / SRO 3.9 / 3.8
K/A Statement: G2.4.39 – Knowledge of RO responsibilities in emergency plan implementation.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

74. Both units are operating at 100% power with the following conditions present:

- RIS-0760D "Main Control Room Ventilation Radiation Monitor" is failed with a trip inserted per GP-25 Appendix 14 "MCR Ventilation Isolation, Division II"
- CONTROL ROOM RAD MONITOR DIV II INITIATED (003 A-3) is lit due to the GP-25 trip

One hour later, an annunciator is received and the PRO observes:

- CONTROL ROOM VENT SUPPLY FAN HI-LO (003 A-1) is in alarm
- Flow Recorder FR-0765 indicates 200 scfm and lowering
- RIS-0760B "Main Control Room Ventilation Radiation Monitor" is failed upscale

Based on these conditions, the Control Room Emergency Ventilation System has _____.

A. started due to the low flow condition

B. NOT started as indicated by the low flow condition

C. started because the Rad Monitor initiation logic is satisfied

D. NOT started because the Rad Monitor initiation logic is NOT satisfied

Answer Key		
Question # 74 RO		
Choice		Basis or Justification
Correct:	C	The CREV system is in service due to the combination of RI-0760B (failed high) and RI-0760D (GP-25 trip).
Distracters:	A	Plausible because CREV will initiate on low flow, but in this case the low flow is being caused by the isolation of normal Control Room Ventilation.
	B	The low flow signal is actually from normal Control Room Ventilation and is normal during a CREV initiation.
	D	Plausible because this logic system is different, in that "B" and "D" make up the logic for initiation even though only a Div II alarm is received. For RPS or PCIS, "B" and "D" would only give a half initiation.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH	3.25	4	10CFR55.41(b)(11)

Source Documentation		
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam: (PB 2005) ☐ Other Exam Bank: ()
Reference(s):	GP-25 Appendix 14; SO 40D.1.A	
Learning Objective:	PLOT-5040D-4a	
K/A System:	G2.3 – Radiation Control	Importance: RO / SRO 2.9 / 2.9
K/A Statement: G2.3.5 – Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

75. Unit 2 pre-startup preparations are in progress in accordance with GP-2 "Normal Plant Startup".

- The RWM is inoperable and bypassed in accordance with AO 62A.1-2 "Rod Worth Minimizer System Manual Bypass"
- The conditions of Tech Spec 3.3.2.1 "Control Rod Block Instrumentation" are met

Per GP-2 "Normal Plant Start-up", in addition to the Reactor Operator, control rod pattern agreement with the startup sequence instructions must be independently verified by:

1. 2nd Licensed Operator
2. Shift Manager
3. Reactor Engineer

A. 1 ONLY

B. 2 ONLY

C. 1 and 2

D. 1, 2 and 3

Answer Key		
Question # 75 RO		
Choice		Basis or Justification
Correct:	C	Per GP-2 and AO 62A.1-2, in addition to the Reactor Operator, a 2nd Licensed Operator and a Shift Manager must independently verify the control rod pattern matches the approved startup sequence instructions.
Distracters:	A	Per GP-2 and AO 62A.1-2, in addition to the Reactor Operator, a 2nd Licensed Operator and a Shift Manager must independently verify the control rod pattern matches the approved startup sequence instructions.
	B	Per GP-2 and AO 62A.1-2, in addition to the Reactor Operator, a 2nd Licensed Operator and a Shift Manager must independently verify the control rod pattern matches the approved startup sequence instructions.
	D	A Reactor Engineer, although required to be present in the Control Room during a reactor startup, is not required to independently verify the control rod pattern matches the approved startup sequence instructions.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY			10CFR55.41(b)(10)

Source Documentation		
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()
Reference(s):	GP-2; AO 62A.1-2	
Learning Objective:	PLOT-5062A-8	
K/A System:	G2.2 – Equipment Control	Importance: RO / SRO 4.5 / 4.4
K/A Statement: G2.2.1 – Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

76. Given the following conditions:

- Unit 2 was initially operating at full power
- The 2B TBCCW pump tripped due to a motor fault
- The 2A TBCCW pump could NOT be started

How is plant operation affected by these events and what actions are required by ON-118 "Loss of TBCCW"?

A. Isophase Bus Cooling is lost, requiring a reactor power reduction to < 18,000 stator amps using GP-9-2 "Fast Reactor Power Reduction".

B. Cooling to the Station Air Compressors is lost, requiring a rapid plant shutdown using GP-9-2 "Fast Reactor Power Reduction".

C. Cooling to the Condensate pumps is lost, requiring an immediate plant shutdown using GP-4 "Manual Reactor Scram".

D. Stator Water Cooling is lost, requiring an immediate plant shutdown using GP-4 "Manual Reactor Scram".

Answer Key		
Question # 76 SRO		
Choice		Basis or Justification
Correct:	A	The Isolated Phase Bus coolers are not vital TBCCW loads. Therefore, on a loss of TBCCW, they are isolated during the swap to RBCCW. Per ON-118, if TBCCW cooling cannot be restored (as is the case here) power must be reduced to less than 18,000 stator amps IAW GP-9-2.
Distractors:	B	There are no direct actions in ON-118 for loss of cooling to the Station Air Compressors. ON-119 "Loss of Instrument Air" directs a rapid plant shutdown using GP-9-2 only if air header pressure cannot be stabilized above 75 psig, or if equipment critical to continued plant operation begins to malfunction due to low air pressure. For a sustained loss of TBCCW, ON-119 directs cross-tying the Unit 2 instrument air system to Unit 3.
	C	Although a loss of TBCCW does result in a loss of cooling to Condensate pumps, ON-118 does not direct an immediate plant shutdown. Instead, monitoring of Condensate pump temperatures is directed and if necessary, the pumps are removed from service, which requires a power reduction using GP-9-2.
	D	A confirmed loss of Stator Water Cooling does require a GP-4 shutdown; however the Stator Water Cooling System is cooled by Service Water, not TBCCW, which is sometimes misconstrued.

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-118 and Bases; ON-119	
Learning Objective:	PLOT-5034-3b	
K/A System:	295018 – Partial or Complete Loss of Component Cooling Water	Importance: SRO 3.5
K/A Statement: AA2.03 – Ability to determine and/or interpret the following as it applies to Partial or Complete Loss of Component Cooling Water: Cause for partial or complete loss.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

77. The following conditions exist on Unit 2 following fuel failure with a Primary System breach in the Turbine Building:

- Reactor power is 50% and lowering
- Control rods are being inserted per GP-9-2 "Fast Reactor Power Reduction"
- 2 VENT EXH STACK RAD MONITOR HI-HI A (218 B-4) is in alarm
- 2 VENT EXH STACK RAD MONITOR HI-HI B (218 C-4) is in alarm
- Vent Stack radiation on RI-2979A(B) is 3.63 E+06 µCi/sec and rising
- MAIN STACK RADIATION HIGH-HIGH (003 D-1) is in alarm
- Main Stack radiation on RI-050A(B) is 4.17 E+05 µCi/sec and rising
- The Primary System breach has NOT been isolated

Which one of the following describes the actions required by T-104 "Radioactivity Release" for these conditions?

A portion of T-104 is PROVIDED ON THE NEXT PAGE.

_____(1)_____ based on _____(2)_____.

A. (1) Manually scram and depressurize per T-101 "RPV Control"
(2) Main Stack effluent

B. (1) Manually scram and depressurize per T-101 "RPV Control"
(2) Vent Stack effluent

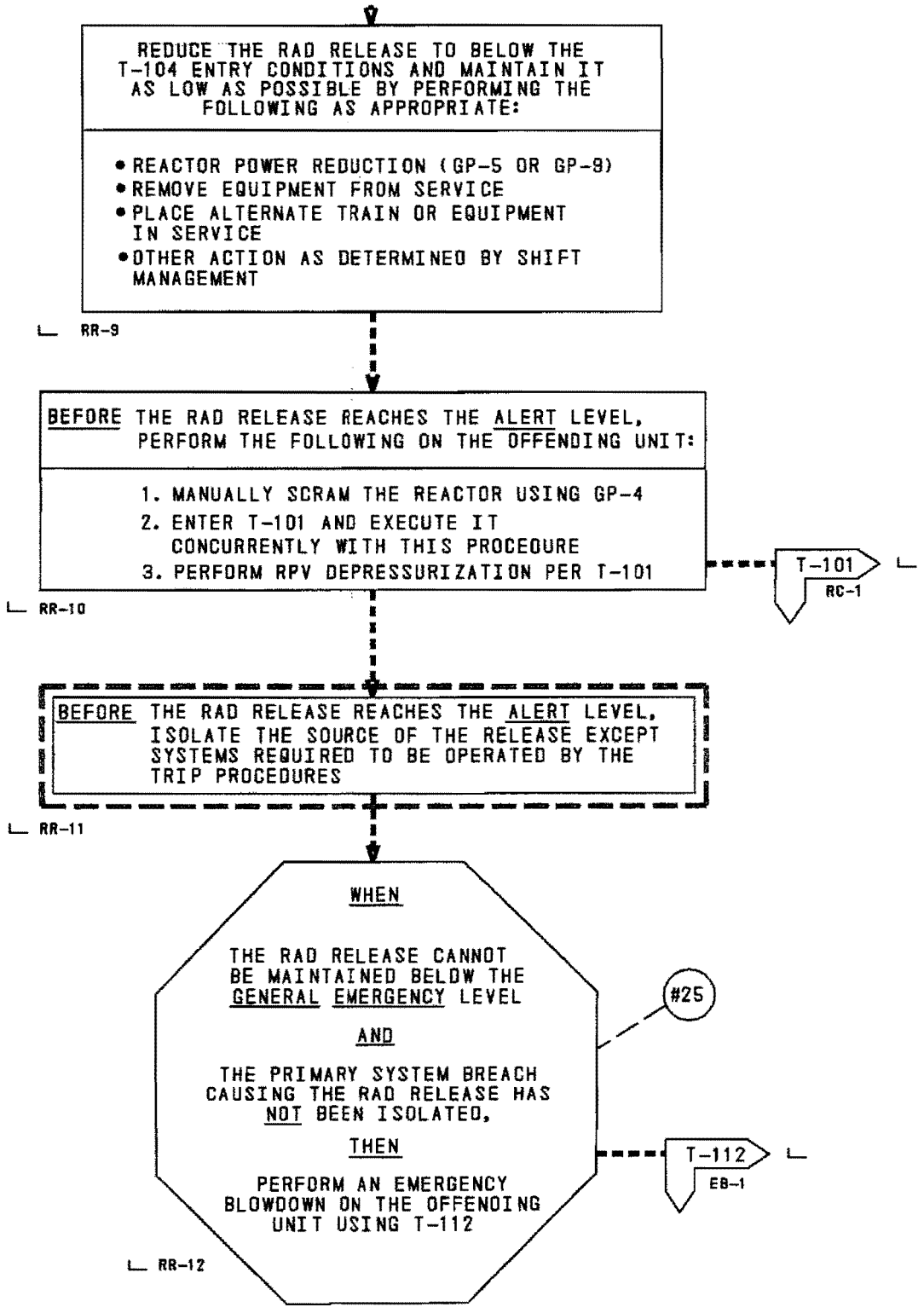
C. (1) Perform T-112 "Emergency Blowdown"
(2) Main Stack effluent

D. (1) Perform T-112 "Emergency Blowdown"
(2) Vent Stack effluent

EP-AA-1007, Table R1

Table R1 -- Effluent Monitor Thresholds				
Release Path	**General Emergency**	**Site Area Emergency**	**Alert**	**Unusual Event**
Main Stack (RI-0-17-050A/B Common)	5.57 E+09 µCi/sec	5.57 E+08 µCi/sec	6.36 E+07 µCi/sec	6.36 E+05 µCi/sec
Vent Stack (RI-2979A/B Unit 2 or RI-3979A/B Unit 3)	3.36 E+08 µCi/sec	3.36 E+07 µCi/sec	3.83 E+06 µCi/sec	3.83 E+04 µCi/sec

T-104 "Radioactivity Release"



Answer Key		
Question # 77 SRO		
Choice		Basis or Justification
Correct:	B	Vent Stack effluent is approaching the Alert level; Main Stack effluent is above the Unusual Event level but well below the Alert level. For these conditions, step RR-10 of T-104 requires a manual scram, T-101 entry, and depressurization per T-101.
Distractors:	A	Main Stack effluent is above the Unusual Event level but well below the Alert level.
	C	Although the primary system breach has not been isolated, Main Stack effluent is well below the GE threshold. An emergency blowdown is not warranted for the given conditions.
	D	Although the primary system breach has not been isolated, Vent Stack effluent is well below the GE threshold. An emergency blowdown is not warranted for the given conditions.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(4)

Source Documentation		
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()
Reference(s):	EP-AA-1007, Table PBAPS 3-1; T-104 and Bases	
Learning Objective:	PLOT-PBIG-2100-3	
K/A System:	295038 – High Off-Site Release Rate	Importance: SRO 4.5
K/A Statement: EA2.04 – Ability to determine and/or interpret the following as it applies to High Off-Site Release Rate: Source of off-site release.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

78. The following conditions exist on Unit 2:

- An ATWS is in progress
- The 2A SBLC pump is injecting into the RPV per T-101, RC/Q
- Initial SBLC tank level on LI-2-11-066 (Panel 20C05A) was 56%

Based on SBLC tank level, when is the earliest boron injection can be terminated? Assume the ATWS continues.

Per T-101 "RPV Control", boron injection can be terminated when SBLC tank level (as read on LI-2-11-066) drops to _____.

A. 44%

B. 36%

C. 12%

D. 0%

Answer Key		
Question # 78 SRO		
Choice		Basis or Justification
Correct:	D	Step RC/Q-18 of T-101 requires the entire SBLC tank to be injected into the RPV. Note #30 (CSBW) only applies when using T-211 to inject boron via the condensate pre-coat tank.
Distractors:	A	Plausible because the applicant may recall step RC/Q-18 allowing boron injection terminated when CSBW (which is approximately equal to a differential SBLC tank level of 44%) has been injected. Confusion on indicated level versus differential level would lead to selecting this choice.
	B	Plausible because the applicant may confuse the definition of HSBW (which is approximately equal to a differential SBLC tank level of 20% [56-20=36%]) with the definition and parameters of CSBW.
	C	Plausible because definition of CSBW is approximately equal to a differential SBLC tank level of 44% (56-44=12%).

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
MEMORY			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; TRIP/SAMP Curves, Tables, and Limits Bases	
Learning Objective:	PLOT-5011-4h	
K/A System:	295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or unknown	Importance: SRO 4.4
K/A Statement: EA2.03 – Ability to determine and/or interpret the following as they apply to SCRAM Condition Present and Reactor Power Above APRM Downscale or unknown: SBLC tank level.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

79. Given the following:

- Both units are operating normally at 100% power
- 3C DC POWER PANEL LO VOLTAGE (309 C-4) alarm is received
- An Equipment Operator reports voltage at Panel 30D023 is 118 VDC

Which one of the following shows the correct Technical Specification actions for these conditions for Units 2 and 3?

Technical Specification 3.8.4 "DC Sources – Operating" is PROVIDED SEPARATELY.

Restore the 3C DC electrical power subsystem to operable status _____.

	Unit 2	Unit 3
A.	within 7 days, OR be in Mode 3 within the next 12 hours	within 12 hours, OR be in Mode 3 within the next 12 hours
B.	within 12 hours, OR be in Mode 3 within the next 12 hours	within 2 hours, OR be in Mode 3 within the next 12 hours
C.	within 12 hours, OR be in Mode 3 within the next 12 hours	within 7 days, OR be in Mode 3 within the next 12 hours
D.	within 2 hours, OR be in Mode 3 within the next 12 hours	within 12 hours, OR be in Mode 3 within the next 12 hours

Answer Key		
Question # 79 SRO		
Choice		Basis or Justification
Correct:	B	Per SR 3.8.4.1, battery terminal voltage must be > 123.5 V. For Unit 3, TS 3.8.4.C applies and requires restoration of the 3C DC subsystem within 2 hours, or Mode 3 within the next 12 hours. For Unit 2, TS 3.8.4.B applies and requires restoration of the 3C DC subsystem within 12 hours, or Mode 3 within the next 12 hours.
Distractors:	A	This is an incorrect application of TS 3.8.4 for the given conditions.
	C	This is an incorrect application of TS 3.8.4 for the given conditions.
	D	This is an incorrect application of TS 3.8.4 for the given conditions.

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 3.8.4 for Units 2 and 3		
Learning Objective:	PLOT-5057-8		
K/A System:	295004 – Partial or Complete Loss of DC Power	Importance:	SRO 4.7
K/A Statement: G2.2.22 – Knowledge of limiting conditions for operations and safety limits.			
REQUIRED MATERIALS:	**Tech Spec 3.8.4 for <u>both</u> units**		
Notes and Comments:			

80. A Drywell steam leak occurred on Unit 2 along with an Anticipated Transient Without Scram (ATWS). Current conditions are as follows:

- Reactor pressure is being maintained 800-1000 psig
- Level has been lowered to control reactor power
- The current RPV level control band is -60 to -120 inches
- HPCI and RCIC are injecting to the RPV

The Reactor Operator reports the following:

- RPV Level Indications
  - Narrow Range +5 inches
  - Wide Range (LI-85A) -110 inches
  - Wide Range (LI-85B) -130 inches
  - Refuel Range (LI-86) -21 inches
- TI-2501 point 126 is NOT available
- TI-2501 point 127 indicates 510 degrees F

For these conditions, determine the status of RPV level and what actions must be directed to control RPV level?

A portion of T-102 "Primary Containment Control" is PROVIDED ON THE NEXT PAGE.

RPV level is _____(1)_____. Direct _____(2)_____.

A. (1) unknown
   (2) entry into T-116 " RPV Flooding"

B. (1) out of band – high
   (2) lowering injection IAW T-240 "Termination and Prevention of Injection"

C. (1) out of band – low
   (2) raising injection IAW T-240 "Termination and Prevention of Injection"

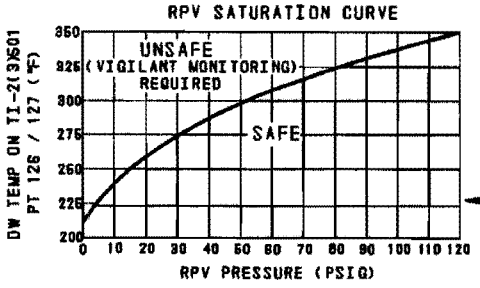
D. (1) within band
   (2) maintaining level IAW T-117 "Level/Power Control"

T-102 "Primary Containment Control"

TABLE DW/T-1
RPV LEVEL INSTRUMENT STATUS

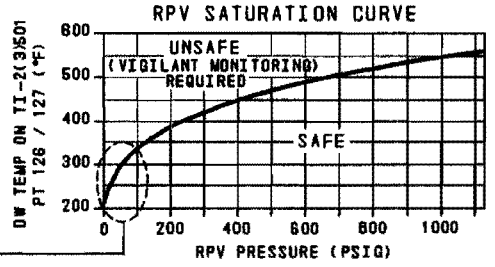
AN RPV LEVEL INSTRUMENT MAY BE USED TO DETERMINE RPV LEVEL ONLY WHEN THE FOLLOWING CONDITIONS ARE SATISFIED:

NOTE: USE AVAILABLE POINTS (126 / 127 OF TI-2(3)501) TO DETERMINE RPV LEVEL INSTRUMENT STATUS



SEE DETAIL

ALL RPV LEVEL INSTRUMENTS



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

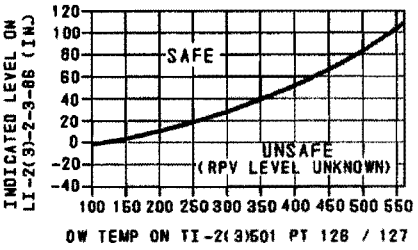
WIDE AND NARROW RANGE INSTS ONLY

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



Answer Key		
Question # 80 SRO		
Choice		Basis or Justification
Correct:	D	Interpreting drywell temperature on DW/T-1 indicates that LI-85A is above Min Indicated Level (MIL), and therefore accurate; LI-85B is below MIL. Narrow Range indication is inaccurate because it is also below MIL. Temperature for both WR and for NR is above Max Run Temp (MRT). Refuel Range indication is inaccurate based on its section of the DW/T-1 curve. Therefore, level is within band on LI-85A; direct maintaining level.
Distractors:	A	If the applicant incorrectly determines the given indications are all valid, the wide divergence in indications might result in a T-116 entry on level unknown.
	B	If the applicant incorrectly determines Narrow and/or Refuel ranges are valid and both WR indications are invalid, level would be above band and would need to be lowered.
	C	If the applicant incorrectly determines LI-85B is accurate then level would indicate below band and would need to be raised.

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 curve DW/T-1		
Learning Objective:	PLOT-1560-4, -5, -7		
K/A System:	295028 – High Drywell Temperature	Importance:	SRO 4.6
K/A Statement: G2.4.21 – Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

81. Given the following:

- A loss of off-site power has occurred
- The crew is performing SE-11 "Loss of Off-Site Power"
- SE-11 Attachment A "Diesel Generator Lockout from the Main Control Room" has been performed on the E-1 and E-3 Diesel Generators
- E-2 DIESEL GEN DIFFERENTIAL AND GROUND (002 G-1) is in alarm
- The E-33 breaker is inoperable and cannot be closed
- The E-4 Diesel Generator will not start

Per SE-11, how many Diesel Generators, if any, are available for operation?

A. 0

B. 1

C. 2

D. 3

Answer Key		
Question # 81 SRO		
Choice		Basis or Justification
Correct:	C	Per SE-11, D/Gs that have been shutdown due to lack of cooling (which is the purpose of SE-11 Attachment A), but are capable of back-feeding an operable ESW or ECW pump, should be counted as available. Therefore, the E-1 and E-3 diesels are available.
Distractors:	A	Only the E-2 and E-4 diesels are unavailable.
	B	E-1 and E-3 diesels are considered available.
	D	A diesel that is running but cannot supply power to any 4KV emergency bus is considered unavailable. E-2 cannot supply either of its 4KV busses due to the generator differential lockout, and the E-4 diesel will not start. Therefore, the E-2 and E-4 diesels are unavailable.

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):	SE-11 and Bases		
Learning Objective:	PLOT-1555-9, -11		
K/A System:	295003 – Partial or Complete Loss of A.C. Power	Importance:	SRO 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:	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 the SE-11 requirements and conditions for Diesel Generator availability.		

82. Unit 2 was operating at 100% power when a Loss of Instrument Air occurred. The following conditions exist:

- SCRAM VALVE PILOT AIR HEADER PRESS HI-LOW (211 D-2) alarms
- A INSTRUMENT AIR HEADER LO PRESS (216 D-3) alarms
- B INSTRUMENT AIR HEADER LO PRESS (216 D-4) alarms
- Scram air header pressure is 50 psig and lowering
- ROD DRIFT (211 D-4) alarms
- The URO reports control rod 22-23 is drifting in

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

A. Scram and enter T-100 "Scram" per ON-119 "Loss of Instrument Air".

B. Use the EMER IN control switch to insert rod 22-23 to Full-In per ON-121 "Drifting Control Rod".

C. Scram and enter T-100 "Scram" IF a second control rod drifts per ON-121 "Drifting Control Rod".

D. Begin a rapid plant shutdown using GP-9-2 "Fast Reactor Power Reduction" per ON-119 "Loss of Instrument Air".

Answer Key		
Question # 82 SRO		
Choice		Basis or Justification
Correct:	A	Applicant must recognize that ON-119 entry is required based on (interpret) IA System alarms. ON-119 directs a reactor scram if any control rod begins to drift in due to decreasing scram air header pressure. The given conditions indicate that scram air header pressure is lowering.
Distractors:	B	This is the correct action per ON-121 for a drifting control rod only (i.e., NOT due to a loss of instrument air). Entry into ON-119 (and direction to scram) overrides ON-121 actions for a drifting control rod.
	C	This is the correct action per ON-121 for a second drifting control rod, but is overridden by the direction in ON-119 to scram on the first drifting rod.
	D	This is required by ON-119 when instrument air header pressure cannot be stabilized above 75 psig, but is overridden by the requirement to scram if any control rod begins to drift.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH	3.0	3	10CFR55.43(b)(5)

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam: (PB 2002) ☐ Other Exam Bank: ()	
Reference(s):	ON-119; ON-121		
Learning Objective:	PLOT-PBIG-1540-22a		
K/A System:	295019 – Partial or Complete Loss of Instrument Air	Importance:	SRO 3.6
K/A Statement: EA2.01 – Ability to determine and/or interpret the following as it applies to Partial or Complete Loss of Instrument Air: Instrument air system pressure.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

83. Given the following:

- Unit 2 is at 100% power
- HPCI is in service per ST-O-023-301-2 "HPCI Pump, Valve, Flow and Unit Cooler Functional and In-Service Test"
- Torus Cooling is in service per SO 10.1.D-2 "RHR System Torus Cooling"
- 30 minutes into the test, Torus bulk average temperature on SPOTMOS reached 96 degrees F and the CRS entered T-102 "Primary Containment Control"
- 45 minutes into the test, the RO recording Torus temperature reports local water temperature in the bay that HPCI is exhausting into is reading 106 degrees F

Which one of the following describes the correct actions for these conditions?

Tech Spec 3.6.2.1 "Suppression Pool Average Temperature" is PROVIDED SEPARATELY.

HPCI testing ____(1)____. Suppression pool temperature must be restored to $\leq$ 95 degrees F within 24 hours ____(2)____.

A. (1) may continue
(2) after testing ends

B. (1) may continue
(2) after exceeding 95 degrees F

C. (1) must be immediately suspended
(2) after testing ends

D. (1) must be immediately suspended
(2) after exceeding 95 degrees F

Answer Key		
Question # 83 SRO		
Choice		Basis or Justification
Correct:	A	Per Tech Spec 3.6.2.1, average torus temperature is allowed to reach 105 degrees F during testing that adds heat to the suppression pool. Local temperature has exceeded this value but average temperature has not. Per Tech Spec 3.6.2.1 Bases, torus temperature must be restored to ≤ 95 degrees F within 24 hours after testing ends.
Distractors:	B	Per Tech Spec 3.6.2.1 Bases, torus temperature must be restored to ≤ 95 degrees F within 24 hours after testing ends.
	C	Per Tech Spec 3.6.2.1, average torus temperature is allowed to reach 105 degrees F during testing that adds heat to the suppression pool.
	D	Per Tech Spec 3.6.2.1, average torus temperature is allowed to reach 105 degrees F during testing that adds heat to the suppression pool. Per Tech Spec 3.6.2.1 Bases, torus temperature must be restored to ≤ 95 degrees F within 24 hours after testing ends.

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 3.6.2.1 and Bases; ST-O-023-301-2		
Learning Objective:	PLOT-5007-8		
K/A System:	295013 – High Suppression Pool Water Temperature	Importance:	SRO 3.5
K/A Statement: AA2.02 – Ability to determine and/or interpret the following as they apply to High Suppression Pool Water Temperature: Localized heating/stratification.			
REQUIRED MATERIALS:	**Tech Spec 3.6.2.1 (Unit 2)**		
Notes and Comments:			

84. Unit 2 is operating at 100% power with ISFSI cask loading operations in progress on the Fuel Floor.

An irradiated fuel assembly is damaged during movement, resulting in the following annunciators:

- 2 VENT EXH STACK RAD MONITOR HI-HI A (218 B-4)
- 2 VENT EXH STACK RAD MONITOR HI-HI B (218 C-4)
- 2 VENT EXH STACK RAD MONITOR HI/TROUBLE A (218 B-5)
- 2 VENT EXH STACK RAD MONITOR HI/TROUBLE B (218 C-5)
- REAC BLDG OR REFUELING FLOOR VENT EXH HI RAD TRIP (218 D-4)

Which of the following actions is/are required for these conditions?

1. Terminate Fuel Floor operations and evacuate the Fuel Floor per ON-124 "Fuel Floor and Fuel Handling Problems"
2. Initiate a plant shutdown using GP-3 "Normal Plant Shutdown" per T-103 "Secondary Containment Control"
3. Reduce reactor power using GP-9-2 "Fast Reactor Power Reduction" per T-104 "Radioactivity Release"

A. 1

B. 2

C. 1 and 2

D. 1 and 3

Answer Key		
Question # 84 SRO		
Choice		Basis or Justification
Correct:	A	For a dropped OR damaged irradiated fuel assembly, ON-124 requires terminating fuel floor operations and evacuating the fuel floor.
Distractors:	B	A GP-3 shutdown is required by T-103 only when Secondary Containment parameters exceed an action level in more than one area. Since there are no action levels for the Refuel Floor, this action does not apply.
	C	A GP-3 shutdown is required by T-103 only when Secondary Containment parameters exceed an action level in more than one area. Since there are no action levels for the Refuel Floor, this action does not apply.
	D	Since the radioactivity release originates from the Fuel Floor (and not the reactor), T-104 steps that direct a power reduction do not apply (per T-104 Bases).

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(7)

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	ON-124; T-103 and Bases; T-104 and Bases		
Learning Objective:	PLOT-PBIG-2100-3		
K/A System:	295034 – Secondary Containment Ventilation High Radiation	Importance:	SRO 4.7
K/A Statement: G2.4.6 – Knowledge of EOP mitigation strategies.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

85. 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 NOT occur.
(2) Reduce power to less than 75% per GP-5 "Power Operations".

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

C. (1) An automatic reactor scram will occur due to a Group I isolation.
(2) Restore RPV level between +5 and +35 inches using RCIC; stabilize RPV pressure below 1050 psig using SRVs and HPCI per T-101 "RPV Control".

D. (1) An automatic reactor scram will occur due to high neutron flux.
(2) Restore RPV level between +5 and +35 inches using Feedwater; stabilize RPV pressure below 1050 psig using Bypass Valves per T-101 "RPV Control".

Answer Key		
Question # 85 SRO		
Choice		Basis or Justification
Correct:	D	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. Since a Group I isolation will not occur, the correct action per T-101 is to restore RPV level using Feedwater and stabilize pressure using Bypass Valves.
Distractors:	A	Per GP-5, Table 1, the reactor can operate up to 75% power with 1 MSIV closed. However, rapid closure of a single MSIV while operating at 100% power will result in a reactor scram.
	B	Per GP-5, Table 1, the reactor can operate up to 75% power with 1 MSIV closed. However, rapid closure of a single MSIV while operating at 100% power will result in a reactor scram.
	C	The three un-isolated steam lines will pass 100% steam flow without exceeding the high steam flow isolation setpoint (~140% of rated). The action required by T-101 (part 2) is correct if a Group I isolation were to occur (plausible).

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

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam: (PB 2008) ☐ Other Exam Bank: ()	
Reference(s):	GP-5; T-101; OP-PB-101-111-1001; UFSAR		
Learning Objective:	PLOT-5001A-6b		
K/A System:	295020 – Inadvertent Containment Isolation	Importance:	SRO 3.7
K/A Statement: AA2.03 – Ability to determine and/or interpret the following as they apply to Inadvertent Containment Isolation: Reactor power.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

86. The following conditions are present on Unit 2 during an ATWS:

- Both CRD pumps are unavailable
- The CRS directs initiation of SBLC
- The URO performs RRC 11.1-2 "SBLC System Initiation During a Plant Event" and reports the following:
  - SBLC pump discharge pressure is 1400 psig
  - SBLC tank level is 56 percent
  - RWCU is isolated

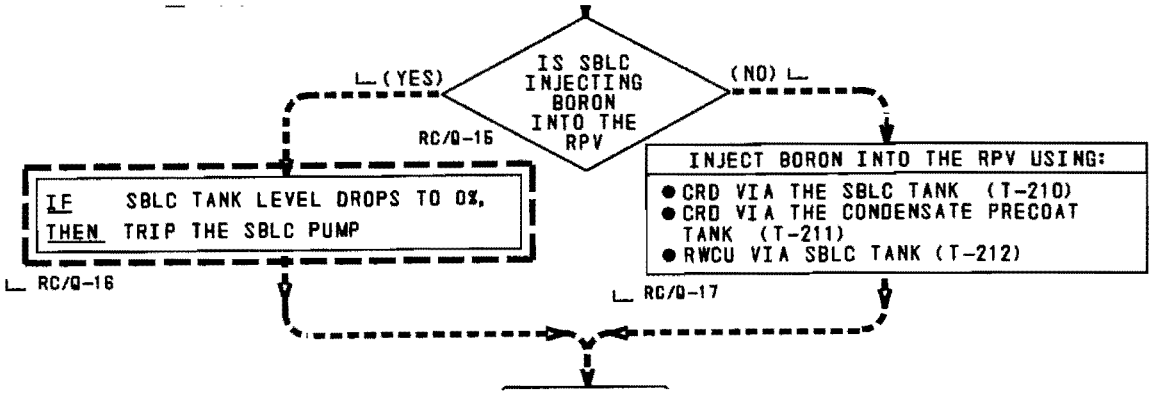
Per T-101 "RPV Control", which one of the following is correct for these conditions?

A. SBLC is injecting; monitor SBLC tank level per T-101 step RC/Q-16.

B. SBLC is NOT injecting; perform T-210 "CRD System SBLC Injection".

C. SBLC is NOT injecting; perform T-211 "CRD System Non-enriched Boric Acid and Borax Injection".

D. SBLC is NOT injecting; perform T-212 "RWCU System SBLC Injection".



Answer Key		
Question # 86 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 a blocked flow path). 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. Based on the given conditions, SBLC is not injecting into the RPV.
	B	The applicant 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 applicant 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: (PB 2008) ☐ Other Exam Bank: ()
Reference(s):	T-101 and Bases; P&ID M-358, Sheet 1	
Learning Objective:	PLOT-5011-4h	
K/A System:	211000 – Standby Liquid Control	Importance: SRO 3.4
K/A Statement: A2.04 – Ability to (a) predict the impacts of the following 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: Inadequate system flow.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

87. An ATWS is in progress on Unit 2. The following indications are present after the SBLC Pump Selector is placed in "Start Sys A":

- SBLC pump "A" RED light is lit
- Both "Squib Valve Continuity" lights are lit
- SBLC pump discharge pressure is 1100 psig
- SBLC tank level is lowering from an initial value of 56 percent
- STANDBY LIQUID SQUIB VALVE LOSS OF CONTINUITY (211 H-3) is NOT in alarm
- MO-2-12-015 "Cleanup Inlet Isolation (Inboard)" GREEN light is lit
- MO-2-12-018 "Cleanup Inlet Isolation (Outboard)" GREEN light is lit
- MO-2-12-068 "Cleanup Outlet Isolation" RED light is lit
- Both RWCU pump GREEN lights are lit
- GROUP II/III OUTBOARD ISOL RELAYS NOT RESET (214 E-1) is in alarm

Which one of the following describes (1) how the plant responded and (2) the required action(s)?

A. (1) SBLC and PCIS responded as designed.
(2) Continue with the actions directed by T-117 "Level/Power Control".

B. (1) The SBLC squib valves failed to fire.
(2) Start the "B" pump using RRC 11.1-2 "SBLC Initiation During A Plant Event".

C. (1) RWCU failed to fully isolate.
(2) Complete the isolation using GP-8B "PCIS Isolation – Groups II and III".

D. (1) The SBLC squib valves failed to fire and RWCU failed to fully isolate.
(2) Start the "B" pump using RRC 11.1-2 "SBLC Initiation During A Plant Event" and complete the isolation using GP-8B "PCIS Isolation – Groups II and III".

Answer Key		
Question # 87 SRO		
Choice		Basis or Justification
Correct:	C	Based on the given conditions, SBLC responded normally. The Group II/III Inboard isolation on SBLC initiation failed (MO-68); must manually isolate the system using GP-8B.
Distractors:	A	SBLC responded normally, but the RWCU system did not isolate fully due to failure of the isolation logic for MO-068. T-117 actions are appropriate, but do not resolve the failed PCIS isolation.
	B	The SBLC indications are normal – the continuity lights remain lit and the "loss of continuity" annunciator will not alarm until the pump control switch is placed in OFF.
	D	RWCU failed to fully isolate because the outlet valve (MO-68) did not go closed. However, SBLC responded normally.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH	3.0	4	10CFR55.43(b)(5)

Source Documentation			
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam: (PB 2005) ☐ Other Exam Bank: ()	
Reference(s):	GP-8B; SO 11.1.B-2; M-1-S-46		
Learning Objective:	PLOT-5011-4g		
K/A System:	223002 – PCIS/Nuclear Steam Supply Shutoff	Importance:	SRO 3.9
K/A Statement: A2.11 – Ability to (a) predict the impacts of the following on PCIS/Nuclear Steam Supply Shutoff system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Standby liquid initiation.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

88. Given the following:

- Unit 2 is in Mode 4 during a forced outage
- The 2D RHR pump is in Shutdown Cooling
- RBCCW is drained for system maintenance
- A loss of 125 VDC panel 20D23 results in a Shutdown Cooling isolation

Per ON-125 "Loss or Unavailability of Shutdown Cooling", which one of the following methods of decay heat removal must be utilized for these conditions?

A. Place Reactor Water Cleanup in service using SO 12.1.A-2 "RWCU System Startup for Normal Operations or Reactor Vessel Level Control".

B. Place additional Fuel Pool Cooling heat exchangers in service using SO 19.1.A-2 "Fuel Pool Cooling System Startup and Normal Operations".

C. Establish Alternate Shutdown Cooling using AO 10.12-2 "Alternate Shutdown Cooling".

D. Start a Recirc pump using SO 2A.1.A-2 "Starting the First Recirculation Pump".

Answer Key		
Question # 88 SRO		
Choice		Basis or Justification
Correct:	C	Since the other methods of decay heat removal are not available, ON-125 Attachment 1 directs using Alternate Shutdown Cooling.
Distractors:	A	RWCU requires RBCCW to be in service; with the RBCCW system drained, there is no method of heat removal from RWCU.
	B	Per ON-125, Fuel Pool Cooling can only be used as an alternate method of decay heat removal when in Mode 5 with the reactor cavity flooded and the gates removed.
	D	Starting a recirc pump is directed by ON-125; however, per SO 2A.1.A-2 RBCCW must be in service prior to starting a recirc 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):	ON-125 and Bases; SE-13	
Learning Objective:	PLOT-PBIG-1550-28b	
K/A System:	263000 – D.C. Electrical Distribution	Importance: SRO 4.2
K/A Statement: G2.4.9 – Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

89. Given the following:

- Spiral core unloading is in progress on Unit 3
- 4 WRNM detectors are in the fueled region
- The signal to noise ratio is 10

Which one of the following shows (1) the minimum number of operable WRNM channels and (2) the minimum required detector reading for these conditions?

Tech Spec 3.3.1.2 "Wide Range Neutron Monitor (WRNM) Instrumentation" is PROVIDED SEPARATELY.

A. (1) 2
(2) > 1 cps

B. (1) 1
(2) > 1 cps

C. (1) 2
(2) no minimum

D. (1) 1
(2) no minimum

Answer Key		
Question # 89 SRO		
Choice		Basis or Justification
Correct:	C	Since more than 1 detector is in the fueled region, a minimum of 2 channels must be operable. Based on Note 2 of SR 3.3.1.2.4, there is no minimum count rate required for spiral off-load.
Distractors:	A	Plausible because the minimum required number of channels is 2, and if Note 2 of SR 3.3.1.2.4 is ignored, count rate must be > 1 cps per figure 3.3.1.2-1. Incorrect because SR 3.3.1.2.4 does not apply to spiral off-load.
	B	Plausible because incorrect application of Table 3.3.1.2-1, footnote (b) would yield only 1 detector is required to be operable; and because if Note 2 of SR 3.3.1.2.4 is ignored, count rate must be > 1 cps per figure 3.3.1.2-1. Incorrect because 2 channels must be operable and SR 3.3.1.2.4 does not apply to spiral off-load.
	D	Plausible because incorrect application of Table 3.3.1.2-1, footnote (b) would yield only 1 detector is required to be operable; and because there is no minimum count rate required for spiral off-load. Incorrect because 2 channels must be operable.

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):	Tech Spec 3.3.1.2 (Unit 3)	
Learning Objective:	PLOT-5060C-8	
K/A System:	215003 – Intermediate Range Monitor System	Importance: SRO 4.7
K/A Statement: G2.2.40 – Ability to apply Technical Specifications for a system.		
REQUIRED MATERIALS:	**Tech Spec 3.3.1.2 (Unit 3)**	
Notes and Comments:		

90. Unit 2 was operating at 100% power when an electrical transient resulted in the following annunciators:

- 2 AUX BUS OVERCURRENT RELAYS (219 A-2)
- 2 AUX BUS LO VOLTAGE (219 B-2)

Predict the impact of this event to determine (1) what condition has priority and (2) what action must be directed by the CRS.

A. (1) Lowering RPV water level
(2) Scram and enter T-100 "Scram" per OT-100 "Reactor Low Level"

B. (1) Lowering RPV water level
(2) Reduce reactor power using GP-9-2 until reactor water level is restored per OT-100 "Reactor Low Level"

C. (1) Thermal hydraulic instability (THI)
(2) Scram and enter T-100 "Scram" per OT-112 "Unexpected/Unexplained Change in Core Flow"

D. (1) Thermal hydraulic instability (THI)
(2) Insert all GP-9-2 rods per OT-112 "Unexpected/Unexplained Change in Core Flow"

Answer Key		
Question # 90 SRO		
Choice		Basis or Justification
Correct:	A	The given conditions indicate an overcurrent lockout of #2 aux bus, which results in a trip of the 2B recirc pump and a trip of the 2B and 2C condensate pumps. This results in a loss of feed and a rapid lowering of RPV water level. A reactor scram is imminent. OT-100 entry is required and will direct entry into T-100 for a scram condition (low RPV water level).
Distractors:	B	OT-100 does direct a power reduction per GP-9-2 if there is "lack of makeup capability". However there is not enough time to perform a fast power reduction due to a rapid lowering of RPV water level—a fast reactor power reduction cannot be performed in time to prevent reaching the automatic scram setpoint. The reactor mode switch must be placed in SHUTDOWN since a scram is imminent.
	C	A loss of #2 aux bus only results in a trip of the 2B recirc pump. Although OT-112 entry is required, it directs entry into T-100 only if there are no recirc pumps running (i.e., a trip of both recirc pumps).
	D	OT-112 entry is required for a trip of the 2B recirc pump and GP-9-2 is directed for a single tripped recirc pump. However, a reactor scram is imminent and the rapidly lowering RPV water level is a higher priority than the actions required by OT-112 for a tripped recirc pump.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH	2.5	3	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-100; OT-112; T-100 Scram		
Learning Objective:	PLOT-PBIG-1540-1		
K/A System:	262001 – A.C. Electrical Distribution	Importance:	SRO 3.4
K/A Statement: A2.10 – Ability to (a) predict the impacts of the following on the A.C. Electrical Distribution; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those abnormal conditions or operations: Exceeding current limitations.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

91. Given the following conditions:

- Unit 2 was initially operating at 100% power
- An EHC System malfunction resulted in a reactor pressure transient
- An RPS failure resulted in reactor pressure peaking at 1340 psig
- An Alert was declared due to the RPS failure

Which one of the following describes whether or not a Safety Limit (SL) violation has occurred and what action(s) is/are required for these conditions?

	SL Violation	Required Action(s)
A.	YES	Restore compliance with all safety limits and insert all insertable control rods within 1 hour, AND notify the NRC of the Safety Limit violation within 4 hours.
B.	YES	Restore compliance with all safety limits and insert all insertable control rods within 2 hours, AND notify the NRC of the event classification within 1 hour.
C.	NO	Notify the NRC of the RPS failure within 4 hours.
D.	NO	Notify the NRC of the event classification within 1 hour.

Answer Key		
Question # 91 SRO		
Choice		Basis or Justification
Correct:	B	Safety limit 2.1.2, Reactor Steam Dome pressure has been exceeded (1325 psig). Per Tech Spec 2.2, for any SL violation, two actions are required within 2 hours: (1) restore compliance with all safety limits and (2) insert all insertable control rods. NRC notification of the Alert declaration is required within 1 hour.
Distractors:	A	Plausible because a safety limit violation has occurred and NRC notification is required within four (4) hours (per LS-AA-1020, SAF 1.16). Incorrect because the actions for violating a SL are required to be performed within 2 hours.
	C	Plausible because the applicant may believe 1375 psig is the safety limit since it is 110% of design pressure (1250 psig). The actual safety limit value of 1325 psig (steam dome) is equivalent to 1375 psig at the lowest point in the RCS. Incorrect because a safety limit has been violated.
	D	Plausible because (same as C) and because NRC notification of the Alert classification is required within 1 hour. Incorrect because a safety limit has been violated.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH			10CFR55.43(b)(1)

Source Documentation		
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam: (PB 2008) ☐ Other Exam Bank: ()
Reference(s):	Tech Spec 2.1.2; LS-AA-1020, SAF 1.16	
Learning Objective:	PLOT-1800-9	
K/A System:	290002 – Reactor Vessel Internals	Importance: SRO 4.5
K/A Statement: A2.06 – Ability to (a) predict the impacts of the following on the Reactor Vessel Internals; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those abnormal conditions or operations: Exceeding safety limits.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

92. Given the following:

- Unit 2 is operating at 100% power
- MO-2-10-26B "RHR Drywell Spray Outboard" failed to open during surveillance testing

What actions are required for this event?

Tech Spec 3.6.1.3 "Primary Containment Isolation Valves" and TRM 3.12 "RHR Drywell Spray" are PROVIDED SEPARATELY.

Deactivate the valve in the closed position in ___(1)___ and restore the valve to operable status within ___(2)___.

A. (1) 1 hour
(2) 8 hours

B. (1) 1 hour
(2) 7 days

C. (1) 4 hours
(2) 8 hours

D. (1) 4 hours
(2) 7 days

Answer Key		
Question # 92 SRO		
Choice		Basis or Justification
Correct:	D	TS 3.6.1.3 Condition A applies – one or more penetration flow paths with 1 PCIV inoperable – and requires deactivating the valve in the closed position within 4 hours. TRM 3.12 Condition A also applies – one RHR drywell spray subsystem inoperable – and requires restoring to operable status within 7 days.
Distractors:	A	Incorrect application of TS 3.6.1.3 and TRM 3.12.
	B	Incorrect application of TS 3.6.1.3.
	C	Incorrect application of TRM 3.12.

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 3.6.1.3; TRM 3.12		
Learning Objective:	PLOT-5010-8		
K/A System:	226001 – RHR/LPCI: Containment Spray Mode	Importance:	SRO 4.7
K/A Statement: G2.2.40 – Ability to apply Technical Specifications for a system.			
REQUIRED MATERIALS:	**Tech Spec 3.6.1.3 (Unit 2) and TRM 3.12 (Unit 2)**		
Notes and Comments:			

93. Unit 2 is operating at 100% power. An inadvertent Group III isolation resulted in a loss of Reactor Building Ventilation. The following conditions are present:

- HIGH AREA TEMP (210 J-3) is in alarm
- STEAM LEAK DETECTION SYSTEM HIGH TEMP (228 E-3) is in alarm
- TRS-2-13-139 Points 1 and 16 "Steam Tunnel" are in alarm; both are reading 185 degrees F and up slow
- T-103 "Secondary Containment Control" has been entered
- The Group III isolation has been reset

Based on these conditions, (1) what isolation is imminent, if any, and (2) what procedural action is required?

A. (1) Group I MSIV isolation
(2) Perform GP-4 "Manual Scram"

B. (1) Group IV HPCI isolation
(2) Perform SO 23.7.C-2 "HPCI System Recovery from System Isolation or Turbine Trip" to restore HPCI following the isolation

C. (1) Group V RCIC isolation
(2) Perform SO 13.7.A-2 "Recovery from RCIC System Isolation or Turbine Trip" to restore RCIC following the isolation

D. (1) NO isolations are imminent
(2) Restore Reactor Building Ventilation using SO 40B.1.A-2 "Reactor Building Ventilation System Startup and Normal Operation"

Answer Key		
Question # 93 SRO		
Choice		Basis or Justification
Correct:	D	Based on the given conditions, there are no isolations that are imminent. T-103 directs restoration of RB ventilation provided radiation levels can be maintained below 10 mR/hr (no high radiation conditions are given).
Distractors:	A	The Group I isolation setpoint is 230 degrees F. With current steam tunnel temperature at 185 degrees F and up slow, the Group I isolation is not imminent. Since the Group III isolation is reset, RB ventilation can be restored well before an isolation setpoint is reached.
	B	Plausible because HPCI steam piping passes through the steam tunnel. Incorrect because although HPCI pipe routing temperatures do rise, they are not directly impacted by the loss of ventilation since HPCI steam leak detection high temperature is sensed in different areas (North Isolation Valve Room, Torus Room and Equipment Room).
	C	Plausible because RCIC steam piping passes through the steam tunnel. Incorrect because although RCIC pipe routing temperatures do rise, they are not directly impacted by the loss of ventilation since RCIC steam leak detection high temperature is sensed in different areas (South Isolation Valve Room, Torus Room and Equipment Room).

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH	2.5	3	10CFR55.43(b)(5)

Source Documentation		
Source:	☐ New Exam Item ☒ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam: (PB 2002) ☐ Other Exam Bank: ()
Reference(s):	ARC-210 J-3; ARC-228 E-3; GP-8A; T-103	
Learning Objective:	PLOT-5040B-3a	
K/A System:	290001 – Secondary Containment	Importance: SRO 3.3
K/A Statement: A2.05 – Ability to (a) predict the impacts of the following on the Secondary Containment; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those abnormal conditions or operations: High area temperature.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

94. Unit 2 is in Mode 3 with preparations in progress to start the '2B' Reactor Recirculation Pump (RRP) in accordance with SO 2A.1.B-2 "Starting the Second Recirculation Pump". The following conditions exist:

- RRP '2A' running at minimum speed
- 'A' Recirc Loop temperature is 295 degrees F
- 'B' Recirc Loop temperature is 255 degrees F
- Bottom Head Drain temperature is 158 degrees F
- RPV Steam Dome pressure is 90 psig

Based on these conditions, which one of the following is correct regarding the start of the '2B' RRP?

Technical Specification 3.4.9 "RCS P/T Limits" and Steam Tables are PROVIDED SEPARATELY.

Starting the '2B' RRP is _____

A. permitted since all differential temperatures are within allowable values.

B. NOT permitted because thermal stresses could exceed design allowances on 'A' Loop components.

C. NOT permitted because thermal stresses could exceed design allowances on 'B' Loop components.

D. NOT permitted because thermal stresses could exceed design allowances on bottom head components.

Answer Key		
Question # 94 SRO		
Choice		Basis or Justification
Correct:	D	Using steam tables, steam dome temp is 331 degrees F and is NOT within bottom drain differential temperature limit of ≤145 degrees F (actual d/t is 173 degrees F). Knowledge of Tech Spec bases is required to identify the area of concern.
Distractors:	A	Bottom head to steam dome differential temperature is not within limits (≤145 degrees F). Knowledge of Tech Spec bases is required to identify the area of concern.
	B	≤ 50 degrees F differential loop to loop limit is met and loop stresses are not exceeded. Knowledge of Tech Spec bases is required to identify the area of concern.
	C	≤ 50 degrees F differential loop to loop limit is met and loop stresses are not exceeded. Knowledge of Tech Spec bases is required to identify the area of concern.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
HIGH	3.0	3	10CFR55.43(b)(2)

Source Documentation		
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam: (PB 2002) ☐ Other Exam Bank: ()
Reference(s):	Tech Spec 3.4.9 and Bases; SO 2A.1.B-2	
Learning Objective:	PLOT-5002-8	
K/A System:	G2.1 – Conduct of Operations	Importance: SRO 4.0
K/A Statement: G2.1.32 – Ability to explain and apply system limits and precautions.		
REQUIRED MATERIALS:	**Tech Spec 3.4.9 (Unit 2) and Steam Tables**	
Notes and Comments:		

95. Given the following:

- Unit 2 is operating at 100% power
- I&C is performing ST-I-07G-101-2 "PCIS Group I Logic System Functional Test"
- PRIMARY CONTAINMENT ISOLATION SYSTEM IN TEST (228 E-1) has repeatedly alarmed due to the surveillance test
- The CRS determined the alarm to be a nuisance and authorized placing the annunciator mode switch in MANUAL
- The ST did NOT provide steps for changing the annunciator mode switch position

Which one of the following describes the action required by OP-AA-103-102 "Watch-Standing Practices" for these conditions?

An ____(1)____ must be used if the annunciator mode switch is in manual greater than ____(2)____.

A. (1) Equipment Status Tag (EST)
(2) 1 hour

B. (1) Equipment Status Tag (EST)
(2) 1 shift

C. (1) Equipment Deficiency Tag (EDT)
(2) 1 hour

D. (1) Equipment Deficiency Tag (EDT)
(2) 1 shift

Answer Key		
Question # 95 SRO		
Choice		Basis or Justification
Correct:	B	For nuisance alarms, OP-AA-103-102 requires use of an EST if the annunciator mode switch will be in manual for greater than 1 shift. If the test procedure gives direction for controlling the annunciator mode switch, an EST is not required.
Distractors:	A	Correct tag; wrong time.
	C	Incorrect tag; incorrect time. Plausible because an EDT is used in cases where an annunciator alarms (and an alarm condition does NOT exist) due to an equipment/instrumentation failure. The applicant may confuse the specific cases involving annunciators when an EST is used versus an EDT.
	D	Incorrect tag; correct time. Plausible because an EDT is used in cases where an annunciator alarms (and an alarm condition does NOT exist) due to an equipment/instrumentation failure. The applicant may confuse the specific cases involving annunciators when an EST is used versus an EDT.

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

Source Documentation			
Source:	☐ New Exam Item ☒ Modified Bank Item ☐ ILT Exam Bank	☒ Previous NRC Exam: (LGS 2002) ☐ Other Exam Bank: ()	
Reference(s):	OP-AA-103-102; OP-AA-108-101; OP-AA-108-105; OP-AA-108-105-1001		
Learning Objective:	PLOT-DBIG-1570-17		
K/A System:	G2.2 – Equipment Control	Importance:	SRO 3.3
K/A Statement: 2.2.43 – Knowledge of the process used to track inoperable alarms.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

96. Unit 2 is operating at power. The Floor Drain Sample Tank needs to be discharged in accordance with ST-C-095-805-2 "Liquid Radwaste Discharge".

Which position below is responsible for REVIEW and VERIFICATION of the Chemistry Technician's calculations prior to the discharge?

A. Chemistry Manager (CM)

B. Plant Reactor Operator (PRO)

C. Control Room Supervisor (CRS)

D. Radiation Protection Manager (RPM)

Answer Key		
Question # 96 SRO		
Choice		Basis or Justification
Correct:	C	Correct per the ST approval requirements.
Distractors:	A	Chemistry Manager reviews post-ST data but does not approve the CT's calculations prior to the discharge.
	B	PRO adjusts the discharge radiation monitor but does not review and/or approve the CT's calculations.
	D	Rad Pro Manager does not review and/or approve the CT's calculations.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
MEMORY	2	2	10CFR55.43(b)(4)

Source Documentation		
Source:	☐ New Exam Item ☐ Modified Bank Item ☒ ILT Exam Bank	☒ Previous NRC Exam: (PB 2002) ☐ Other Exam Bank: ()
Reference(s):	ST-C-095-805-2	
Learning Objective:	PLOT-1770-3	
K/A System:	G2.3 – Radiation Control	Importance: SRO 4.3
K/A Statement: 2.3.11 – Ability to control radiation releases.		
REQUIRED MATERIALS:	**NONE**	
Notes and Comments:		

97. Unit 2 was operating at 70% power when the '2B' Recirc pump tripped. The following conditions currently exist:

- Indicated Core Flow (FR-2-2-3-095 black pen) is 51 Mlbm/hr
- 'B' Recirc Loop Flow (FI-2-2-3-092A) is 5 Mlbm/hr
- APRMs are oscillating between 50 and 55% in 4-5 second regular intervals

Assess these conditions and identify the correct procedural action.

GP-5-1 "PBAPS Power Flow Operation Map" is PROVIDED SEPARATELY.

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

A. (1) Region 2
(2) exit Region 2 by inserting control rods IAW GP-9-2 "Fast Reactor Power Reduction"

B. (1) Region 2
(2) scram the reactor and enter T-100 "Scram" due to indications of Thermal Hydraulic Instability

C. (1) Region 2
(2) exit Region 2 by restarting '2B' Recirc pump using SO 2A.1.B-2 "Starting the Second Recirculation Pump"

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

Answer Key		
Question # 97 SRO		
Choice		Basis or Justification
Correct:	A	Per GP-5, the calculation for core flow is indicate core flow minus 2 times inactive loop flow [51-2(5) = 41 Mlbm/hr]. This value (41 Mlbm/hr) can be found on the upper 'x' axis of the BSSPFOM. Alternatively, core flow in percent of rated [41 Mlbm/hr / rated flow of 102.5 Mlbm/hr = 40%] can be found on the lower 'x' axis. Plotting 41 Mlbm/hr vs. 50-55% power shows the reactor is operating in Region 2. Per OT-112, the required action is to insert GP-9 rods to exit the region.
Distractors:	B	The indications provided do indicate power oscillations, but it does not meet the criteria for THI. A scram is NOT required.
	C	Region 2 is correct. Starting the 2B Recirc pump is incorrect. Per OT-112, if in Region 2, either insert control rods or raise recirc flow to exit Region 2. Per OT-112 Bases, starting a 2nd Recirc pump is NOT an acceptable method for exiting Region 2.
	D	If the applicant does not multiply two times the inactive flow (common error), he will believe that the operating point is 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: (PB 2005) ☐ Other Exam Bank: ()
Reference(s):	OT-112; AO 60A.1-2; GP-5	
Learning Objective:	PLOT-PBIG-1540-3, -4	
K/A System:	G2.4 – Emergency Procedures / Plan	Importance: SRO 4.4
K/A Statement: 2.4.49 – Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.		
REQUIRED MATERIALS:	**GP-5-1 "PBAPS Power Flow Operation Map" (blackout "immediate exit" from box in upper left corner)**	
Notes and Comments:	It is the SRO's job function to determine the operating point on the Power-to-Flow map (or Backup Stability Solution Power Flow Operation Map), which is an "immediate operator action" of OT-112.	

98. Given the following:

- A Site Area Emergency has been declared at Peach Bottom
- The Technical Support Center (TSC) and Emergency Operations Facility (EOF) are activated with command and control functions transferred accordingly
- An emergency exposure of greater than 5 Rem TEDE is required to terminate a radioactive release

According to EP-AA-113 "Personnel Protective Actions", who must authorize the emergency exposure?

1. The Shift Manager in the Control Room
2. The Station Emergency Director in the TSC
3. The Corporate Emergency Director in the EOF

A. 1

B. 2

C. Both 1 and 2

D. Both 2 and 3

Answer Key		
Question # 98 SRO		
Choice		Basis or Justification
Correct:	B	Per EP-AA-1007 (among others), emergency exposure controls are non-delegable responsibilities that remain with the Station Emergency Director. Since the TSC is activated, the Shift Manager (Shift Emergency Director) has transferred this responsibility to the Station Emergency Director. Per EP-AA-113, the Station Emergency Director (TSC) authorizes emergency exposures greater than 5 Rem TEDE.
Distractors:	A	Since the TSC is activated, the Shift Manager (Shift Emergency Director) has transferred this responsibility to the Station Emergency Director.
	C	Since the TSC is activated, the Shift Manager (Shift Emergency Director) has transferred this responsibility to the Station Emergency Director.
	D	Per EP-AA-1007 (among others), emergency exposure controls are non-delegable responsibilities that remain with the Station Emergency Director.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
MEMORY			10CFR55.43(b)(4)

Source Documentation		
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()
Reference(s):	EP-AA-1007; EP-AA-113	
Learning Objective:	G5-2, -3	
K/A System:	G2.3 – Radiation Control	Importance: SRO 3.8
K/A Statement: 2.3.13 – 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:		

99. Per OP-AA-112-101 "Shift Relief and Turnover", turnover of control room command during transients and casualties is _____.

A. NOT allowed

B. allowed during stable periods of low activity with permission from the Shift Manager

C. allowed during stable periods of low activity with permission from the SOS

D. allowed during stable periods of low activity with permission from the Ops Director

Answer Key		
Question # 99 SRO		
Choice		Basis or Justification
Correct:	B	OP-AA-112-101, section 4.13, allows turnover of control room command during stable periods of low activity with Shift Manager permission.
Distractors:	A	Turnover is allowed.
	C	Shift Manager permission is required.
	D	Shift Manager permission is required.

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

Source Documentation			
Source:	☒ New Exam Item ☐ Modified Bank Item ☐ ILT Exam Bank	☐ Previous NRC Exam: () ☐ Other Exam Bank: ()	
Reference(s):	OP-AA-112-101		
Learning Objective:	PLOT-DBIG-1570-17		
K/A System:	G2.1 – Conduct of Operations	Importance:	SRO 4.8
K/A Statement: 2.1.6 – Ability to manage the control room crew during plant transients.			
REQUIRED MATERIALS:	**NONE**		
Notes and Comments:			

100. T-116 "RPV Flooding" Sheet 1 (non-ATWS) was entered due to a transient on Unit 2. The following conditions exist:

- T-116 Step RF-14 is being performed
- During the emergency blowdown, only four SRVs could be opened
- The four SRVs closed following RPV depressurization
- All RHR pumps are injecting into the RPV
- RPV pressure dropped to 10 psig before it began to rise
- RPV pressure is currently 130 psig and rising slowly
- The four SRVs now indicate open
- Open SRV tailpipe temperatures are 330 degrees F and rising slowly
- Torus level is 14.5 feet and continues to slowly lower
- HPCI TURB INLET DRAIN HI LEVEL/INSTR FAIL (221 D-2) is in alarm
- RCIC TURB INLET STEAM LINE DRAIN POT HI LEVEL (222 D-2) is in alarm

For these conditions, (1) what is the status of the Main Steam Lines and (2) what action is required?

T-116 Sheet 1 is PROVIDED SEPARATELY.

The Main Steam Lines are ____(1)____. The required action is to ____(2)____.

A. (1) NOT flooded
(2) continue to add injection sources

B. (1) NOT flooded
(2) continue injecting with RHR only

C. (1) flooded
(2) transition immediately to T-116 step RF-19

D. (1) flooded
(2) pursue alternate depressurization using T-116 step RF-17

Answer Key		
Question # 100 SRO		
Choice		Basis or Justification
Correct:	A	Per T-116 Sheet 1 Note 41, a combination of indications must be used to determine if the main steam lines are flooded. In this case, there is at best only 1 indication of main steam line flooding – the RPV pressure rise. Note that per T-116 Bases, the HPCI and RCIC steam isolation valves must be open for the HPCI and RCIC alarms to count. Since at least 2 SRVs were opened initially, Step RF-12 closes the HPCI and RCIC steam isolation valves. All other parameters indicate the main steam lines are not flooded.
Distractors:	B	Step RF-14 directs starting all pumps and maximizing RPV injection until the main steam lines are flooded.
	C	The main steam lines are NOT flooded.
	D	The main steam lines are NOT flooded.

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):	T-116 and Bases	
Learning Objective:	PLOT-PBIG-2100-3	
K/A System:	G2.4 – Emergency Procedures / Plan	Importance: SRO 4.2
K/A Statement: 2.4.46 – Ability to verify that the alarms are consistent with plant conditions.		
REQUIRED MATERIALS:	**T-116, Sheet 1**	
Notes and Comments:		