

1. The 2A Drywell Equipment Drain pump was running during automatic pump down of the Drywell Equipment Drain Sump when the following alarms were received:

- GROUP II/III INBOARD ISOL. RELAYS NOT RESET (214 D-1)
- DRYWELL SUMP VALVES 94 OR 95 CLOSED (215 E-4)

Which one of the following shows the design response of the Drywell Equipment Drain (DWED) pumps and valves?

- |    |                           |         |
|----|---------------------------|---------|
| A. | Inboard Isolation AO-094  | Closed  |
|    | Outboard Isolation AO-095 | Open    |
|    | 2A DWED Pump              | Running |
|    | 2B DWED Pump              | Tripped |
| B. | Inboard Isolation AO-094  | Closed  |
|    | Outboard Isolation AO-095 | Open    |
|    | 2A DWED Pump              | Tripped |
|    | 2B DWED Pump              | Running |
| C. | Inboard Isolation AO-094  | Closed  |
|    | Outboard Isolation AO-095 | Open    |
|    | 2A DWED Pump              | Tripped |
|    | 2B DWED Pump              | Tripped |
| D. | Inboard Isolation AO-094  | Closed  |
|    | Outboard Isolation AO-095 | Closed  |
|    | 2A DWED Pump              | Tripped |
|    | 2B DWED Pump              | Tripped |

<b>Answer Key</b>		
<b>Question # 1 RO</b>		
Choice	Basis or Justification	
Correct:	C	The given conditions indicate an inboard half isolation, causing DWED sump inboard isolation valve AO-094 to close. Nothing in the stem would indicate that outboard valve AO-095 has closed. If either the inboard or outboard isolation valve closes, both DWED pumps will trip.
Distractors:	A	Plausible if the applicant does not recall that the 2A DWED pump will trip if either isolation valve closes.
	B	Plausible if the applicant believes the 2B DWED pump will start on trip of the 2A pump during automatic pump down, and does not recall that either isolation valve closing will trip both pumps.
	D	Plausible if the applicant believes the conditions indicate a full (inboard and outboard) isolation of the DWED sump.

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

<b>Source Documentation</b>		
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> Other Exam Bank: () <input type="checkbox"/> ILT Exam Bank	
Reference(s):	ARC-215 E-4; GP-8.C COL	
Learning Objective:	PLOT-5007G-1m	
K/A System:	223002 – Primary Containment Isolation System/Nuclear Steam Supply Shut-off	Importance: RO / SRO 2.8 / 3.1
K/A Statement: K1.14 – Knowledge of the physical connections and/or cause-effect relationship between the Primary Containment Isolation System/Nuclear Steam Supply Shut-off and the following: Containment drainage system.		
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>	
Notes and Comments:		

2. Given the following:

- Unit 2 is operating at 100% power
- The 2A RPS Bus is being supplied by the Alternate Power Supply, 20Y050
- The 2A RPS MG Set is in service, ready to power the 2A RPS Bus
- The CRS directed you to transfer RPS Power Supplies

Which one of the following Primary Containment Isolation System (PCIS) Groups will need to be RESET following the power transfer?

- A. Group II Inboard Half Isolation
- B. Group III Inboard Half Isolation
- C. Group II Outboard Half Isolation
- D. Group III Outboard Half Isolation



3. Select the correct Shutdown Cooling suction valve electrical power supplies.

MO-2-10-17 “Shutdown Cooling Suction Outboard Isolation” is powered by a \_\_\_\_\_(1)\_\_\_\_\_.

MO-2-10-18 “Shutdown Cooling Suction Inboard Isolation” is powered by a \_\_\_\_\_(2)\_\_\_\_\_.

- A. (1) 250 VDC Safety Related Bus  
(2) 250 VDC Safety Related Bus
- B. (1) 250 VDC Safety Related Bus  
(2) 480V Emergency Bus MCC
- C. (1) 480V Emergency Bus MCC  
(2) 250 VDC Safety Related Bus
- D. (1) 480V Emergency Bus MCC  
(2) 480V Emergency Bus MCC

<b>Answer Key</b>		
<b>Question # 3 RO</b>		
Choice	Basis or Justification	
Correct:	B	MO-2-10-17 is powered by 250 VDC Safety Related Bus 20D11. MO-2-10-18 is powered by 480V E Bus supplied MCC E-124-R-C.
Distractors:	A	MO-2-10-17 is powered by 250 VDC Safety Related Bus 20D11. MO-2-10-18 is powered by 480V E Bus supplied MCC E-124-R-C.
	C	MO-2-10-17 is powered by 250 VDC Safety Related Bus 20D11. MO-2-10-18 is powered by 480V E Bus supplied MCC E-124-R-C.
	D	MO-2-10-17 is powered by 250 VDC Safety Related Bus 20D11. MO-2-10-18 is powered by 480V E Bus supplied MCC E-124-R-C.

<b>Psychometrics</b>			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY	2.5	3	10CFR55.41(b)(7)

<b>Source Documentation</b>	
Source:	<input type="checkbox"/> New Exam Item <input checked="" type="checkbox"/> Previous NRC Exam: (PB 2005) <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> Other Exam Bank: () <input checked="" type="checkbox"/> ILT Exam Bank
Reference(s):	SO 10.1.B-2; SO 10.1.B-2A COL, E-1615; E-26
Learning Objective:	PLOT-5010-2b
K/A System:	205000 – Shutdown Cooling System (RHR Shutdown Cooling Mode) <span style="float: right;">Importance: RO / SRO 2.5 / 2.7</span>
K/A Statement: K2.02 – Knowledge of the electrical power supplies to the following: Motor operated valves.	
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>
Notes and Comments:	

4. Unit 2 conditions are as follows:

- Reactor power is 100%
- RPS bus 'A' is aligned to its ALTERNATE power supply, 20Y050
- RPS bus 'B' is aligned to its NORMAL RPS MG Set power supply
- A loss of 3 SUE occurred, causing a 4KV emergency bus fast transfer
- The E-222 breaker did NOT close on the fast transfer

No operator actions have been taken. Which one of the following describes the status of RPS one minute later?

- A. NO Scram
- B. HALF Scram on RPS 'A'
- C. HALF Scram on RPS 'B'
- D. FULL Scram



5. A Loss of Coolant Accident occurred on Unit 3. The following plant conditions exist:

- Reactor level initially dropped to -180 inches
- Reactor level is now -150 inches and is rising slowly
- All RHR and Core Spray pumps started automatically and are injecting
- Operators have NOT manipulated any RHR or Core Spray pump controls
- Reactor pressure is 250 psig and lowering
- Drywell pressure is 16 psig and rising

With these conditions present a loss of off-site power (LOOP) occurs. All Emergency Diesel Generators (EDGs) start and load their respective busses.

Which statement below describes how Core Spray pumps will be restarted to control Reactor water level for these conditions?

The Core Spray pumps will \_\_\_\_\_ once their respective emergency bus reaches 95% of rated voltage.

- A. require a manual restart
- B. automatically restart immediately
- C. automatically restart after a six (6) second time delay
- D. automatically restart sequentially after 13 seconds (A, C) and 23 seconds (B, D)



6. Unit 2 is operating at full power when the Standby Liquid Control injection sparger becomes clogged. This results in the pressure input from this line being 10 psig lower than actual.

Evaluate this condition to determine the impact, if any, on indicated Core Plate Flow as read on the Control Room Flow Recorder (FR-095).

Indicated Core Plate Flow on FR-095 will be \_\_\_\_\_.

- A. higher than actual
- B. lower than actual
- C. reading zero
- D. unaffected



7. Unit 3 is at 100% power with the 3A RHR pump in full flow test in accordance with ST-O-010-301-3 "A RHR Loop Pump, Valve, Flow and Unit Cooler Functional and In-Service Test".

During the test, a steam leak in the drywell results in the following conditions:

- The Reactor is scrammed; all control rods are inserted
- RPV level reached -60 inches and is rising due to HPCI injection
- RPV pressure is 800 psig and lowering
- Drywell pressure is 4 psig and rising
- Offsite power remains available to the 4KV buses

Based on these conditions, which one of the following describes the status of the Unit 3 RHR System?

- A. NO RHR pumps are operating.
- B. ALL RHR pumps are operating on minimum flow.
- C. 3A RHR pump remains in full flow test; ALL other RHR pumps remain shutdown.
- D. 3A RHR pump is operating on minimum flow; ALL other RHR pumps remain shutdown.

<b>Answer Key</b>		
<b>Question # 7 RO</b>		
Choice	Basis or Justification	
Correct:	C	The 3A RHR pump remains running in full flow test since full flow test valves MO-3-10-034A and -039A will not receive a close signal until RPV pressure is < 450 psig. The other pumps did not receive any auto-start signals (-160 inches RPV level <u>OR</u> drywell pressure > 2 psig and RPV pressure < 450 psig).
Distractors:	A	The 3A RHR pump remains running in full flow test; there is no trip signal to the 3A RHR pump and there was no loss of power to the 4KV busses. Plausible if applicant does not understand RHR logic.
	B	The 3B, 3C and 3D RHR pumps will not auto-start until a LPCI initiation signal is received. This occurs at -160 inches RPV level <u>OR</u> if drywell pressure is > 2 psig and RPV pressure is < 450 psig. Plausible if applicant does not understand RHR logic.
	D	The 3A RHR pump remains running in full flow test since full flow test valves MO-3-10-034A and -039A will not receive a close signal until RPV pressure is < 450 psig. Plausible since the Core Spray full flow test valves close when drywell pressure exceeds 2 psig, regardless of RPV pressure.

<b>Psychometrics</b>			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH	2.5	3	10CFR55.41(b)(7)

<b>Source Documentation</b>		
Source:	<input checked="" type="checkbox"/> New Exam Item <span style="margin-left: 200px;"><input type="checkbox"/> Previous NRC Exam: ()</span> <input type="checkbox"/> Modified Bank Item <span style="margin-left: 150px;"><input type="checkbox"/> Other Exam Bank: ()</span> <input type="checkbox"/> ILT Exam Bank	
Reference(s):	M-1-S-65; RHR DBD P-S-09, pages 118-122	
Learning Objective:	PLOT-5010-4j	
K/A System:	203000 – RHR/LPCI: Injection Mode	Importance: RO / SRO 3.1 / 3.4
K/A Statement: K4.09 – Knowledge of the RHR/LPCI: Injection Mode design feature(s) and/or interlocks which provide for the following: Surveillance for all operable components.		
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>	
Notes and Comments:		

8. 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. RBCCW cooling to the compressors will be lost; the compressors must be shutdown and nitrogen loads must be aligned to Backup Nitrogen (bottles).
- B. RBCCW cooling to the compressors will be lost; the compressors must be shutdown and nitrogen loads must be aligned to Instrument Air.
- C. RBCCW cooling to the compressors will be lost; TBCCW will automatically align to cool the compressors.
- D. No impact; the compressors will continue to be cooled by RBCCW.



9. Which one of the following meets the conditions for Automatic Depressurization System (ADS) actuation?
- A. Drywell pressure at 4.1 psig  
Reactor water level at  $-120''$  for 10 minutes  
'A' and 'D' Core Spray pumps operating
  - B. Drywell pressure at 5.0 psig  
Reactor water level at  $-165''$  for 5 minutes  
'A' and 'B' Core Spray pumps operating
  - C. Drywell pressure at 1.2 psig  
Reactor water level at  $-165''$  for 5 minutes  
'B' RHR pump operating
  - D. Drywell pressure at 2.7 psig  
Reactor water level at  $-165''$  for 3 minutes  
'D' RHR pump operating

<b>Answer Key</b>		
<b>Question # 9 RO</b>		
Choice		Basis or Justification
Correct:	D	This is the only set of conditions shown that satisfies all of the ADS logic requirements: level below -160 inches, drywell pressure above 2 psig, at least one RHR pump (or the correct combination of Core Spray pumps) running, and the 105 second timer timed out.
Distractors:	A	Reactor level must be below -160 inches.
	B	The right combination of ECCS pumps is not available; must have at least 1 RHR pump, <u>OR</u> the right combination of Core Spray pumps: A or B <u>and</u> C or D.
	C	Drywell pressure is below 2 psig and the 9.5 minute high drywell pressure bypass is not present.

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

<b>Source Documentation</b>			
Source:	<input type="checkbox"/> New Exam Item <input type="checkbox"/> Modified Bank Item <input checked="" type="checkbox"/> ILT Exam Bank		<input checked="" type="checkbox"/> Previous NRC Exam: (PB 2007) <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	M-1-S-52; ARC-227 D-4		
Learning Objective:	PLOT-5001G-5		
K/A System:	218000 – Automatic Depressurization System	Importance:	RO / SRO 3.8 / 3.8
K/A Statement: K5.01 – Knowledge of the operational implications of the following concepts as it applies to the Automatic Depressurization System: ADS logic operation.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

10. Given the following:

- Unit 2 is operating at 100% power
- FEEDWATER FIELD INSTRUMENT TROUBLE (201 H-1) alarms
- 'A' Steam Line Flow Transmitter (DPT 2-6-51A) indicates downscale

Based on these conditions, the Digital Feedwater System is in \_\_\_\_ (1) \_\_\_\_ and Reactor Feedwater pump turbine SPEED will \_\_\_\_ (2) \_\_\_\_.

- A. (1) single-element control  
(2) remain steady
- B. (1) three-element control  
(2) remain steady
- C. (1) single-element control  
(2) lower until level stabilizes at a new lower level
- D. (1) three-element control  
(2) lower until level stabilizes at a new lower level



11. Unit 2 is in MODE 2 with a reactor startup in progress.

- The reactor is subcritical
- Control rod withdrawal has begun
- 2B 24/48 VDC Distribution Panel (20D045) is lost

What effect will this have on the Wide Range Neutron Monitoring (WRNM) System?

- A. Rod Block ONLY
- B. RPS Channel 'B' Half Scram ONLY
- C. Rod Block and RPS Channel 'B' Half Scram
- D. Loss of B, D, F, and H WRNM ODAs on panel 20C005

Answer Key		
Question # 11 RO		
Choice	Basis or Justification	
Correct:	C	A loss of power to 20D045 will result in a half scram and rod block due to a WRNM INOP condition.
Distractors:	A	Plausible if applicant does not understand the effects of a power loss on the WRNM system and believes the given conditions will only result in a rod block.
	B	Plausible if applicant does not understand the effects of a power loss on the WRNM system and believes the given conditions will only result in a half scram.
	D	20D045 does not power the ODAs; they are powered by 20Y050. Plausible if applicant does not recall the function of the different power supplies to the WRNM system.

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

Source Documentation	
Source:	<input type="checkbox"/> New Exam Item <input checked="" type="checkbox"/> Modified Bank Item <input checked="" type="checkbox"/> ILT Exam Bank <input checked="" type="checkbox"/> Previous NRC Exam: (PB 2005) <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	ARC-210 H-3
Learning Objective:	PLOT 5060C-2c, -4a, -4b
K/A System:	215003 – Intermediate Range Monitor System (WRNM at Peach Bottom) <span style="float: right;">Importance: RO / SRO 3.6 / 3.8</span>
K/A Statement: K6.02 – Knowledge of the effect that a loss or malfunction of the following will have on the Intermediate Range Monitor (WRNM) System: 24/48 volt D.C. power.	
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>
Notes and Comments:	

12. Given the following:

- Unit 2 is operating at 100% power
- SYSTEM II CORE SPRAY LOGIC POWER FAIL (226 B-1) alarm is received
- Investigation reveals a blown fuse on 125 VDC power distribution panel 20D022

Subsequently, a LOCA occurs, resulting in the following plant conditions:

- RPV level is -75 inches
- RPV pressure is 420 psig
- Drywell pressure is 4.5 psig

Which one of the following describes the status of the Core Spray System?

<u>'A' Core Spray Loop</u>	<u>'B' Core Spray Loop</u>
A. Both pumps ON; injection valve is OPEN	Both pumps ON; injection valve is OPEN
B. Both pumps ON; injection valve is CLOSED	Both pumps OFF; injection valve is CLOSED
C. Both pumps ON; injection valve is OPEN	Both pumps OFF; injection valve is CLOSED
D. Both pumps ON; injection valve is CLOSED	Both pumps ON; injection valve is CLOSED

<b>Answer Key</b>		
<b>Question # 12 RO</b>		
Choice	Basis or Justification	
Correct:	C	Plant conditions call for Core Spray initiation and injection (below 450 psig reactor pressure). A loss of 125 VDC power panel 20D022 causes a loss of power to Core Spray loop 'B' logic, which will prevent it from actuating on a LOCA signal. Core Spray loop 'A' is not affected by a loss of 20D022.
Distractors:	A	'B' Core Spray logic will not actuate. Plausible since each RHR logic channel provides pump start signals to BOTH loops of RHR; applicant may confuse Core Spray logic with RHR logic.
	B	'B' Core Spray logic will not actuate. Plausible since each RHR logic channel provides pump start signals to BOTH loops of RHR, but does not provide redundant valve control interlocks; applicant may confuse Core Spray logic with RHR logic.
	D	'A' loop is injecting with both pumps; 'B' loop pumps are not running. Plausible if applicant gets logic confused and/or does not recall RPV pressure permissive for injection.

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

<b>Source Documentation</b>		
Source:	<input checked="" type="checkbox"/> New Exam Item <span style="margin-left: 200px;"><input type="checkbox"/> Previous NRC Exam: ()</span> <input type="checkbox"/> Modified Bank Item <span style="margin-left: 180px;"><input type="checkbox"/> Other Exam Bank: ()</span> <input type="checkbox"/> ILT Exam Bank	
Reference(s):	ARC-226 B-1; M-1-S-40	
Learning Objective:	PLOT-5014-6d	
K/A System:	209001 – Low Pressure Core Spray System	Importance: RO / SRO 2.8 / 2.9
K/A Statement: K6.04 – Knowledge of the effect that a loss or malfunction of the following will have on the Low Pressure Core Spray System: D. C. power.		
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>	
Notes and Comments:		

13. Given the following conditions on Unit 2:

- Battery Charger 2AD003 is placed in the Equalize Mode in accordance with SO 57B.1-2 “125/250 Volt Station Battery Charger Operations”
- During the charge, AC power to the charger is lost due to a momentary loss of power to the E-12 bus
- Power is subsequently restored to the E-12 bus by the diesel generator

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

The 2A Battery Charger \_\_\_\_\_.

- A. automatically returns to the “float” charge mode
- B. automatically returns to the “equalize” charge mode
- C. is deenergized and must be manually returned to service
- D. is deenergized; the standby charger must be placed in service

Answer Key		
Question # 13 RO		
Choice	Basis or Justification	
Correct:	B	From Note 2 in SO 57B.1-2: "Upon a loss of AC input power, the battery charger will return to the same mode it was in once power is restored. IF the battery charger was in the Equalize mode, THEN the timer will pick up where it was interrupted AND time out."
Distractors:	A	The charger will return to the equalize charge mode. Plausible if the applicant remembers the charger will automatically restart but does not remember it will return to the same mode it was in prior to the power loss.
	C	The battery charger will automatically restart 15 seconds after the E12 bus is restored. Plausible if the applicant does not remember that the charger will automatically restart.
	D	The battery charger will automatically restart 15 seconds after the E12 bus is restored. Plausible if the applicant does remember that power is restored to the original charger and that both chargers are powered from the same AC source.

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

Source Documentation		
Source:	<input type="checkbox"/> New Exam Item <span style="margin-left: 200px;"><input checked="" type="checkbox"/> Previous NRC Exam: (PB 2008)</span> <input checked="" type="checkbox"/> Modified Bank Item <span style="margin-left: 100px;"><input type="checkbox"/> Other Exam Bank: ()</span> <input checked="" type="checkbox"/> ILT Exam Bank	
Reference(s):	SO 57B.1-2	
Learning Objective:	PLOT-5057-6a	
K/A System:	263000 – D.C. Electrical Distribution	Importance: RO / SRO 2.5 / 2.8
K/A Statement: A1.01 – Ability to predict and/or monitor changes in parameters associated with operating the D.C. Electrical Distribution controls including: Battery charging/discharging rate.		
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>	
Notes and Comments:		

14. Unit 3 was manually scrammed following a loss of feedwater. Current plant conditions are as follows:
- HPCI and RCIC automatically started and injected until they tripped on high RPV water level
  - Reactor water level is currently +46 inches and dropping slowly
  - Reactor pressure is 925 psig and being controlled automatically by EHC

Which one of the following correctly describes the RCIC System response to these conditions?

The RCIC \_\_\_\_ (1) \_\_\_\_ and the RCIC system will automatically re-inject when Reactor water level has lowered to \_\_\_\_ (2) \_\_\_\_.

- A. (1) Turbine is tripped  
(2) +29 inches
- B. (1) Turbine is tripped  
(2) -48 inches
- C. (1) Turbine Supply Valve (MO-131) is closed  
(2) +29 inches
- D. (1) Turbine Supply Valve (MO-131) is closed  
(2) -48 inches

<b>Answer Key</b>		
<b>Question # 14 RO</b>		
Choice	Basis or Justification	
Correct:	D	RCIC does not trip on high level (because it can not auto reset a trip like HPCI); instead the turbine supply valve (MO-131) closes. The valve will not reopen until a -48" initiation signal is received (unlike HPCI which will restart at +29").
Distractors:	A	RCIC does not trip on high level and will not re-inject until -48".
	B	RCIC does not trip on high level.
	C	The RCIC turbine supply valve (MO-131) is shut, but the system will not re-inject until reactor water level drops to -48".

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

<b>Source Documentation</b>		
Source:	<input type="checkbox"/> New Exam Item <input type="checkbox"/> Modified Bank Item <input checked="" type="checkbox"/> ILT Exam Bank	<input checked="" type="checkbox"/> Previous NRC Exam: (PB 2005) <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	OT-110, Step 3.6	
Learning Objective:	PLOT-5013-4b	
K/A System:	217000 – Reactor Core Isolation Cooling System	Importance: RO / SRO 4.0 / 4.0
K/A Statement: A1.03 – Ability to predict and/or monitor changes in parameters associated with operating the Reactor Core Isolation Cooling System controls including: Reactor water level.		
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>	
Notes and Comments:		

15. Unit 2 was operating at 100% power.

- The crew is performing a surveillance test for full load testing of the E4 Emergency Diesel Generator (EDG)
- The EDG has just been synchronized to the E-42 Bus

Shortly after the E4 Diesel output breaker is closed, a loss of off-site power (LOOP) occurs.

Based on these conditions, which one of the following describes (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 52A.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 52A.1.B “Diesel Generator Operations”.



16. Unit 2 was manually scrammed due to a leak in the Torus.

- HPCI is being used for RPV pressure control
- RCIC is being used for RPV level control
- Torus level is 9.5 feet and lowering

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

- A. RCIC must be shutdown using RRC 13.1-2 "RCIC Operation During a Plant Event" to prevent exceeding the vortex limit.
- B. HPCI must be shutdown using RRC 23.1-2 "HPCI Operation During a Plant Event" to prevent exceeding the vortex limit.
- C. RCIC must be shutdown using RRC 13.1-2 "RCIC Operation During a Plant Event" to prevent direct pressurization of the Torus air space.
- D. HPCI must be shutdown using RRC 23.1-2 "HPCI Operation During a Plant Event" to prevent direct pressurization of the Torus air space.

<b>Answer Key</b>		
<b>Question # 16 RO</b>		
Choice		Basis or Justification
Correct:	D	T-102 directs HPCI shutdown if torus level cannot be maintained above 9.5 feet as this is where the exhaust line is uncovered. Operation of HPCI, with its relatively high exhaust pressure, could result in direct pressurization of the torus air space, threatening primary containment integrity.
Distractors:	A	Normal alignment for RCIC is with suction from the CST. Therefore there is no concern for the RCIC vortex limit (which is 6 feet). Plausible if the applicant does not recall the normal RCIC lineup and/or is confused on the various limits associated with torus level.
	B	Normal alignment for HPCI is with suction from the CST. Therefore there is no concern for the HPCI vortex limit (which is below 9.5 feet). Plausible if the applicant does not recall the normal RCIC lineup and/or is confused on the various limits associated with torus level.
	C	RCIC turbine exhaust pressure is insufficient to cause pressurization of the torus. In addition, RCIC is likely to trip on high exhaust pressure if torus pressure became elevated. Plausible if the applicant confuses the HPCI and RCIC limits associated with torus level.

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

<b>Source Documentation</b>		
Source:	<input type="checkbox"/> New Exam Item <input checked="" type="checkbox"/> Modified Bank Item <input checked="" type="checkbox"/> ILT Exam Bank	<input checked="" type="checkbox"/> Previous NRC Exam: (LGS 2006) <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	T-102 and Bases	
Learning Objective:	PLOT-5023-6e	
K/A System:	206000 – High Pressure Coolant Injection System	Importance: RO / SRO 3.4 / 3.6
K/A Statement:	A2.07 – Ability to (a) predict the impacts of the following on the High Pressure Coolant Injection System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Low suppression pool level.	
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>	
Notes and Comments:		

17. Unit 3 is operating at 100% power when the '3A' Reactor Protection System (RPS) bus is manually transferred to its alternate power source.

Based on this event, what is the automatic response of the Standby Gas Treatment (SGTS)?

SGTS \_\_\_\_ (1) \_\_\_\_ will start and the \_\_\_\_ (2) \_\_\_\_ Filter inlet/outlet dampers will OPEN.

- A. (1) 'B' Fan  
(2) 'A' Train
- B. (1) 'C' Fan  
(2) 'B' Train
- C. (1) 'B' Fan  
(2) 'B' Train
- D. (1) 'C' Fan  
(2) 'A' Train



18. An electrical transient occurred on the E-12 bus.

No operator actions have been taken. The following indications and alarms are present:

- E1 Diesel RED light is lit
- E1 Diesel GREEN light is NOT lit
- E1 Diesel frequency meter indicates 60.5 Hz
- E12 Breaker RED light is NOT lit
- E12 Breaker GREEN light is NOT lit
- E12 Bus voltage meter indicates downscale (3150 Volts)
- 2 EMERG TRANS TROUBLE (001 A-3)
- E12 BUS DIFFERENTIAL OR OVERCURRENT RELAYS (001 C-1)
- E124 TRANS BKR TRIP (001 D-2)
- E212 BKR TRIP (001 E-2)
- E1 DIESEL RUNNING (001 G-4)
- E1 DIESEL GEN TROUBLE (001 G-5)

Based on these indications, which one of the following describes the status of the E1 Diesel and E12 Bus?

- A. E1 Diesel is running, supplying the E12 Bus
- B. E1 Diesel is running, offsite power is supplying the E12 Bus
- C. E1 Diesel is running, the E12 Bus is deenergized
- D. E1 Diesel is NOT running, the E12 Bus is deenergized

<b>Answer Key</b>		
<b>Question # 18 RO</b>		
Choice		Basis or Justification
Correct:	C	Based on the given conditions, the E1 diesel is running but there is a fault on the E12 bus and therefore it is deenergized. Indications that the diesel is running include: diesel RED and GREEN light status, diesel frequency meter indication and E1 DIESEL RUNNING annunciator. Indications that the E12 bus is deenergized include: bus voltage meter indication and E12 BUS DIFFERENTIAL OR OVERCURRENT RELAYS alarm.
Distractors:	A	The E1 diesel is running, but the E12 bus is deenergized due to fault. Plausible if applicant does not recognize indications / alarms associated with a faulted bus.
	B	The E12 bus is deenergized due to fault. Plausible if applicant does not recognize indications / alarms associated with a faulted bus.
	D	The E1 diesel is running. Plausible if applicant does not recognize indications / alarms associated with a running diesel generator.

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

<b>Source Documentation</b>		
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> ILT Exam Bank	<input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	SO 52A.1.B, ARC-001 C-1	
Learning Objective:	PLOT-5052-4	
K/A System:	264000 – Emergency Diesel Generators	Importance: RO / SRO 3.4 / 3.4
K/A Statement: A3.03 – Ability to monitor automatic operations of the Emergency Diesel Generators including: Indicating lights, meters and recorders.		
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>	
Notes and Comments:		

19. Given the following:

- Unit 2 is operating at 100% power
- BLOWDOWN RELIEF VALVES HI TEMP (227 B-4) alarm is received
- 'A' SRV tailpipe temperature on TR-2-02-103 indicates 300 degrees F and steady

Which statement below is correct for these conditions?

These indications are consistent with a(n) \_\_\_\_ (1) \_\_\_\_ SRV. Entry into OT-114 "Inadvertent Opening of a Relief Valve" is \_\_\_\_ (2) \_\_\_\_.

- A. (1) leaking  
(2) required
- B. (1) leaking  
(2) NOT required
- C. (1) open  
(2) required
- D. (1) open  
(2) NOT required unless confirmed by other indications

<b>Answer Key</b>		
<b>Question # 19 RO</b>		
Choice	Basis or Justification	
Correct:	C	A tailpipe temperature of 300 degrees F is consistent with an open SRV at 100% power. Per OT-114 Bases, "alarm 227 B-4 is actuated when an SRV tailpipe thermocouple reaches 300 degrees F and therefore indicates that the associated valve is open."
Distractors:	A	Part 1 is incorrect; part 2 is correct. A tailpipe temperature of 300 degrees F is higher than what is expected for a leaking SRV. Per OT-114, 300 degrees F is an indication of an open SRV.
	B	Parts 1 and 2 are incorrect. A tailpipe temperature of 300 degrees F is higher than what is expected for a leaking SRV. Per OT-114, 300 degrees F is an indication of an open SRV.
	D	Part 1 is correct; part 2 is incorrect. OT-114 entry condition is "any indication of a stuck open SRV".

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

<b>Source Documentation</b>		
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> Other Exam Bank: () <input type="checkbox"/> ILT Exam Bank	
Reference(s):	ARC-227 B-4; OT-114 and Bases	
Learning Objective:	PLOT-5001A-5a; PLOT-PBIG-1540-1, -2	
K/A System:	239002 – Relief/Safety Valves	Importance: RO / SRO 3.6 / 3.7
K/A Statement: A4.02 – Ability to manually operate and/or monitor in the control room: Tail pipe temperatures.		
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>	
Notes and Comments:		

20. Unit 2 is operating at 70% power at the end of cycle with the following conditions:

- All APRM channels are in-service and operable
- APRM '1' has a total of 13 LPRM detectors bypassed
- APRM '1' has 7 out of a possible 10 'B' level LPRM detectors bypassed

Based on these conditions, which APRM '1' response is correct if an additional 'B' level LPRM to APRM '1' is manually bypassed?

- A. NO alarms and NO Rod Block
- B. An APRM TROUBLE alarm and Rod Block
- C. An APRM DOWNSCALE alarm and Rod Block
- D. An APRM INOP alarm, Rod Block and Scram Vote to RPS

Answer Key		
Question # 20 RO		
Choice	Basis or Justification	
Correct:	B	APRM trouble alarm and rod block due to "too few inputs" (< 3 LPRMs per level). APRM will continue to average the remaining LPRMs.
Distractors:	A	Total LPRMs are still greater than the "too few inputs" per APRM setpoint (< 20 LPRMs total), but < 3 LPRMs per level generates an alarm and rod block.
	C	Trouble alarm only and 30 LPRMs remaining at 70% power will not result in an APRM downscale trip.
	D	Conditions result in a trouble alarm only, NOT an INOP trip with the GE NUMAC APRM system. Plausible since standard BWR APRM system generates an INOP trip on too few inputs.

Psychometrics			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH	4.0	3	10CFR55.41(b)(6)

Source Documentation			
Source:	<input type="checkbox"/> New Exam Item <input type="checkbox"/> Modified Bank Item <input checked="" type="checkbox"/> ILT Exam Bank	<input checked="" type="checkbox"/> Previous NRC Exam: (PB 2002) <input type="checkbox"/> Other Exam Bank: ()	
Reference(s):	ARC-211 A-3; ARC-211 C-2; ARC-211 E-5; Tech Spec 3.3.1.1 Bases		
Learning Objective:	PLOT-5060-4g		
K/A System:	215005 – Average Power Range Monitor/ Local Power Range Monitor System	Importance:	RO / SRO 3.6 / 3.8
K/A Statement: A4.06 – Ability to manually operate and/or monitor in the control room: Verification of proper functioning/operability.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

21. Given the following:

- An ATWS is in progress on Unit 2
- The CRS directed the URO to inject Standby Liquid Control (SBLC)
- The URO placed the SBLC control switch to START SYSTEM 'A'

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

- A. BOTH "Squib Valve Continuity" lights will extinguish.
- B. ONLY the 2A "Squib Valve Continuity" light will extinguish.
- C. STANDBY LIQUID SQUIB VALVE LOSS OF CONTINUITY alarm will be received.
- D. GROUP II/III INBOARD AND OUTBOARD ISOLATION RELAYS NOT RESET alarms will be received.



22. 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) control switch position
- C. (1) H, E, and L  
(2) acoustic monitoring
- D. (1) H, E, and L  
(2) control switch position



23. The Instrument Air System is in a normal lineup when the following occur:
- INSTRUMENT AIR DRYER TROUBLE (216 C-4) alarm is received
  - B INSTRUMENT AIR HEADER LO PRESS (216 D-4) alarm is received
  - 'B' Instrument Air Header Pressure (PI-2425B) on Panel 20C012 is lowering
  - 'B' Instrument Air Receiver Pressure (PI-2429B) on Panel 20C012 is steady at 110 psig
  - The TBEO reports there is a valve malfunction on the 'B' Instrument Air Dryer and that neither the 'C' or 'D' drying tower is in service

Which one of the following describes the correct action to mitigate this event?

- A. Isolate the 'B' Instrument Air Dryer
- B. Bypass the 'B' Instrument Air Dryer
- C. Cross-tie 'A' and 'B' instrument air headers
- D. Cross-tie Unit 2 and Unit 3 'B' instrument air headers

<b>Answer Key</b>		
<b>Question # 23 RO</b>		
Choice	Basis or Justification	
Correct:	D	The given conditions indicate both towers for the 'B' air dryer are isolated, which means there is no flow to the 'B' instrument air header from the 'B' air compressor/receiver. Therefore, 'B' instrument air header pressure will continue to lower. Per ON-119, the correct action to take for this condition is to cross-tie the Unit 2 and Unit 3 'B' instrument air headers.
Distractors:	A	This alone will not mitigate this event; the 'B' instrument air dryer is effectively already isolated from the 'B' instrument air header. In order to restore 'B' instrument air header pressure, the Unit 2 and 3 instrument air headers must be cross-tied.
	B	There is no provision for bypassing a malfunctioning dryer in ON-119 or ARC-216 C-4. Both references direct cross-tying the Unit 2 and Unit 3 instrument air headers.
	C	Cross-tying the 'A' and 'B' instrument air headers will not be effective in restoring 'B' instrument air header pressure since the 'A' supply must pass through the 'B' air dryer in order to supply the 'B' header.

<b>Psychometrics</b>			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH	3.0	2	10CFR55.41(b)(10)

<b>Source Documentation</b>		
Source:	<input type="checkbox"/> New Exam Item <span style="margin-left: 150px;"><input checked="" type="checkbox"/> Previous NRC Exam: (PB 2007)</span> <input checked="" type="checkbox"/> Modified Bank Item <span style="margin-left: 150px;"><input type="checkbox"/> Other Exam Bank: ()</span> <input checked="" type="checkbox"/> ILT Exam Bank	
Reference(s):	ARC-216 C-4; ON-119	
Learning Objective:	PLOT-5036-6b	
K/A System:	300000 – Instrument Air System (IAS)	Importance: RO / SRO 2.9 / 3.0
K/A Statement: K3.03 – Knowledge of the effect that a loss or malfunction of the Instrument Air System will have on the following: Cross-tied units.		
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>	
Notes and Comments:		

24. Unit 2 was operating at 100% power when a feedwater malfunction resulted in a reactor scram.
- HPCI and RCIC initiated on low RPV level
  - Reactor level is now +20 inches and rising
  - Subsequently, LT-2-02-3-072C, one of the two Wide Range Reactor Water Level inputs to HPCI logic fails downscale
  - All other RPV level instruments remain operable

Assuming no operator action is taken, which one of the following describes HPCI System response as RPV level rises?

The HPCI System will \_\_\_\_\_ at +46 inches RPV level.

- A. trip AND isolate
- B. trip but NOT isolate
- C. isolate but NOT trip
- D. NOT trip and NOT isolate



25. Given the following:

- Unit 2 is operating at 25% power
- #2 APRM fails downscale (not INOP)

This condition will generate an \_\_\_\_\_.

- A. alarm ONLY
- B. alarm, Rod Block and Half scram
- C. alarm, Rod Block and Full scram
- D. alarm and Rod Block; NO scram signals



26. Unit 2 is initially operating at 100% power when the following events occur (all times are in minutes):

- T=0 – Drywell pressure is 2.1 psig
- T=2 – the E32 BUS DIFFERENTIAL OR OVERCURRENT RELAYS (004 C-1) alarm is received
- T=5 – the ‘A’ EMERG SERVICE WATER PUMP TRIP (002 B-5) alarm is received

Assuming no operator actions, what is the status of the ‘B’ ESW pump and the ECW pump two minutes later?

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



27. Given the following:

- Unit 2 is operating at 85% power
- The 2A Reactor Feed Pump tripped
- Reactor level dropped to +15 inches before turning and beginning 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



28. Given the following:

- Unit 2 was initially operating at 100% power
- 7 Drywell Cooler Fans have their control switches in RUN
- 7 Drywell Cooler Fans have their control switches in AUTO
- A loss of offsite power (LOOP) occurs
- All 4 EDGs start and re-energize their associated busses
- RPV level is being maintained by HPCI and RCIC
- Drywell pressure is 0.9 psig

With no operator actions, what is the status of the Drywell Cooler Fans?

- A. ALL fans are tripped
- B. ALL fans are running
- C. ONLY the 7 fans in RUN are running
- D. ONLY the 7 fans in AUTO are running

<b>Answer Key</b>		
<b>Question # 28 RO</b>		
Choice		Basis or Justification
Correct:	C	If power is lost to the 480 V emergency MCCs, the running fans will stop. When power is restored, the fans with control switches in RUN will restart; the fans with control switches in AUTO will remain off.
Distractors:	A	When power is restored, the fans with control switches in RUN will restart. All fans would be tripped if drywell pressure was above 2 psig.
	B	Fans with their control switch in AUTO only start on a low flow condition following a 10-second time delay.
	D	Fans with their control switch in AUTO only start on a low flow condition following a 10-second time delay.

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

<b>Source Documentation</b>			
Source:	<input type="checkbox"/> New Exam Item <input type="checkbox"/> Previous NRC Exam: ()		
	<input type="checkbox"/> Modified Bank Item <input type="checkbox"/> Other Exam Bank: ()		
	<input checked="" type="checkbox"/> ILT Exam Bank		
Reference(s):	E-195, sheet 1		
Learning Objective:	PLOT-5040C-6a		
K/A System:	223001 – Primary Containment System and Auxiliaries	Importance:	RO / SRO 2.7 / 2.9
K/A Statement:			
K2.09 – Knowledge of the electrical power supplies to the following: Drywell cooling fans.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

29. Given the following:

- A reactor startup is in progress on Unit 2
- The following control rod drive conditions exist:
  1. Control rod 18-39 is at position '04' and is stuck
  2. Control rod 38-19 is at position '36' and is isolated
  3. Control rod 42-43 is at position '48' and has a slow scram time

Which of these conditions has a negative effect on Shutdown Margin?

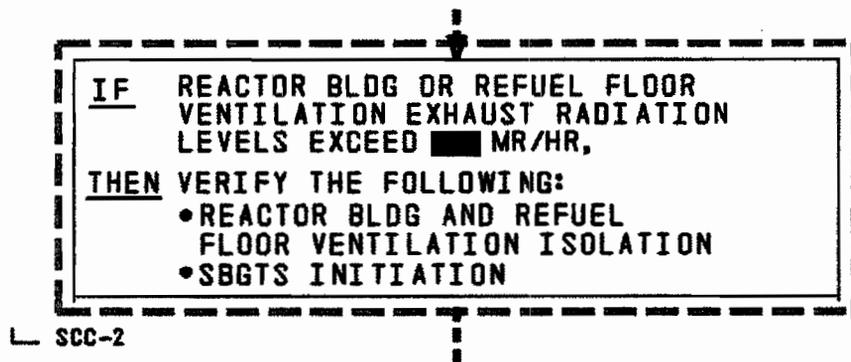
- A. 1 and 2 ONLY
- B. 1 and 3 ONLY
- C. 2 and 3 ONLY
- D. 1, 2 and 3

<b>Answer Key</b>		
<b>Question # 29 RO</b>		
Choice	Basis or Justification	
Correct:	A	A control rod that is stuck at position '04' along with a control rod that is isolated from its HCU at position '36' challenges Tech Spec shutdown margin criteria. Reactor Engineering determination is required under these conditions to determine if SDM criteria are met.
Distractors:	B	A single control rod with a slow scram time does not challenge shutdown margin criteria. Tech Spec 3.1.4 allows up to 13 (depending on location), but the bases for limiting the number of slow control rods is to ensure valid transient and accident analysis assumptions, not for shutdown margin.
	C	A single control rod with a slow scram time does not challenge shutdown margin criteria.
	D	A single control rod with a slow scram time does not challenge shutdown margin criteria.

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

<b>Source Documentation</b>		
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> Other Exam Bank: () <input type="checkbox"/> ILT Exam Bank	
Reference(s):	SO 3.7.E-2; Tech Spec definitions; Tech Spec 3.1; T-101, Note 24	
Learning Objective:	PLOT-1800-3; PLOT-PBIG-2101-T101-4, -6	
K/A System:	201003 – Control Rod and Drive Mechanism	Importance: RO / SRO 3.2 / 3.8
K/A Statement: K3.03 – Knowledge of the effect that a loss or malfunction of the Control Rod and Drive Mechanism will have on the following: Shutdown margin.		
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>	
Notes and Comments:		

30. Per T-103 "Secondary Containment Control" Bases, which statement below describes the reason for the following step?



- A. Prevent an offsite radioactive release.
- B. Provide for a filtered and elevated release.
- C. Minimize the radiation exposure to station personnel.
- D. Route release path through hardened ducts to prevent ductwork failure.



31. Given the following:

- Unit 2 is operating at 100% power
- The 'A' RPS bus was transferred to its alternate power supply
- Reactor Building Ventilation is being restored in accordance with SO 40B.1.A-2 "Reactor Building Ventilation System Startup and Normal Operation"
- After placing all system fans in their normal lineup, Reactor Building and Refuel Floor differential pressures on Panel 20C012 indicate +0.1 inches H<sub>2</sub>O

Which one of the following actions is correct in accordance with SO 40B.1.A-2?

- A. remove one RB Exhaust Fan from service
- B. place one additional RB Supply Fan in service
- C. remove one RF Floor Supply Fan from service
- D. place one additional Equipment Cell Exhaust Fan in service

<b>Answer Key</b>		
<b>Question # 31 RO</b>		
Choice	Basis or Justification	
Correct:	C	Per SO 40B.1.A-2, the normal ventilation system lineup is 1 Equipment Cell exhaust fan, 2 RB supply fans, 2 RB exhaust fans, 2 RF supply fans and 2 RF exhaust fans. Per the SO, if the normal ventilation system lineup does not establish normal differential pressure (-0.1 to -0.4 inches H <sub>2</sub> O), the procedure directs removing one RF supply OR exhaust fan from service. In this case, a RF supply fan must be removed from service to establish the proper negative d/p.
Distractors:	A	Since normal differential pressure is -0.1 to -0.4 inches H <sub>2</sub> O, removing one RB exhaust fan from service would cause differential pressures to become more positive. Plausible if applicant does not know required d/p range and/or does not understand ventilation system design.
	B	Since normal differential pressure is -0.1 to -0.4 inches H <sub>2</sub> O, placing one additional RB supply fan in service would cause differential pressures to become more positive. In addition, SO 40B.1.A-2 gives direction to avoid running 3 RB supply or exhaust fans at the same time. Plausible if applicant does not know required d/p range and/or does not understand ventilation system design.
	D	This would make d/p negative, but SO 40B.1.A-2, Caution 4.5.1-1, prohibits running both Equipment Cell exhaust fans. Plausible if applicant does not recall SO 40B.1.A-2 cautions and limitations.

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

<b>Source Documentation</b>			
Source:	<input checked="" type="checkbox"/> New Exam Item <span style="margin-left: 200px;"><input type="checkbox"/> Previous NRC Exam: ()</span> <input type="checkbox"/> Modified Bank Item <span style="margin-left: 200px;"><input type="checkbox"/> Other Exam Bank: ()</span> <input type="checkbox"/> ILT Exam Bank		
Reference(s):	SO 40B.1.A-2		
Learning Objective:	PLOT-5040B-5b		
K/A System:	288000 – Plant Ventilation Systems	Importance:	RO / SRO 3.2 / 3.4
K/A Statement: K5.02 – Knowledge of the operational implications of the following concepts as they apply to Plant Ventilation Systems: Differential pressure control.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

32. ON-114 “Actual Fire Reported in the Power Block, Diesel Generator Building, Emergency Pump, Inner Screen or Emergency Cooling Tower Structures” contains the following note:

**NOTE**

IF power is lost to the Motor Driven Fire Pump (00P064) controller for more than 8 seconds, THEN the Motor Driven Fire Pump automatic start feature is defeated. This interlock does NOT affect the ability to manually start the pump. Guidance for resetting the auto start logic can be found in SO 37B.1.A “Common Plant Fire Water System Lineup for Automatic Operation”.

The basis for defeating the automatic start feature is to prevent \_\_\_\_\_.

- A. the pump from automatically starting with reduced bus voltage
- B. overloading the diesel generators during a loss of off-site power
- C. a simultaneous start with the Diesel Driven Fire Pump and a water hammer
- D. a spurious start due to loss of power to the fire header pressure instrumentation

<b>Answer Key</b>		
<b>Question # 32 RO</b>		
Choice	Basis or Justification	
Correct:	B	ON-114 Bases for the note says that the defeat of the auto start feature occurs after an 8 second loss of power to prevent an auto start during a LOOP event which could cause an EDG to exceed its 200 hour rating.
Distractors:	A	The candidate could believe that this interlock is to protect the Fire Pump from damage due to low bus voltage.
	C	The candidates are trained to have concern for situations that may cause water hammers and resultant equipment damage and possible personnel safety issues, however, this is not the concern in this situation.
	D	Loss of instrumentation is a plausible concern for causing an undesired system operation.

<b>Psychometrics</b>			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY	3.0	3	10CRF55.41(b)(8)

<b>Source Documentation</b>			
Source:	<input type="checkbox"/> New Exam Item <input checked="" type="checkbox"/> Previous NRC Exam: (PB 2005)		
	<input type="checkbox"/> Modified Bank Item <input type="checkbox"/> Other Exam Bank: ()		
	<input checked="" type="checkbox"/> ILT Exam Bank		
Reference(s):	ON-114 Bases		
Learning Objective:	PLOT-PBIG-1550-4		
K/A System:	286000 – Fire Protection System	Importance:	RO / SRO 3.1 / 3.1
K/A Statement: K6.01 – Knowledge of the effect that a loss or malfunction of the following will have on the Fire Protection System: A. C. electrical distribution.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

33. Given the following:

- Control Room Ventilation was initially in a normal lineup
- The PRO performed SO 40D.7.B “Place Control Room Emergency Ventilation In Service From The Control Room”

Which one of the following describes the effect of this action on Control Room pressure relative to Turbine Building pressure?

Control Room pressure will \_\_\_\_\_.

- A. remain approximately the same since it is controlled by modulating dampers
- B. remain approximately the same since it is based on supply & exhaust fan capacity
- C. become more positive since more air is being supplied to the Control Room
- D. become more negative since more air is being exhausted from the Control Room

<b>Answer Key</b>		
<b>Question # 33 RO</b>		
Choice	Basis or Justification	
Correct:	B	During normal operation, the CR ventilation system maintains the control room at a positive pressure by virtue of the capacities of the supply, fresh air and return fans—20,600 CFM is delivered by the supply and fresh air fans; 18,600 CFM is exhausted by the return and exhaust fans. The remaining 2000 CFM pressurizes the control room and is exfiltrated to the turbine building. CREV operation does not change control room pressure since 3000 CFM is supplied by the CREV supply fans and 1000 CFM is still exhausted (to the TB roof) via the toilet and utility room exhaust fan. The remaining 2000 CFM pressurizes the control room and is exfiltrated to the turbine building, as was the case during normal operation.
Distractors:	A	The control room ventilation system uses modulating dampers to control temperature and humidity, not for controlling control room pressure.
	C	Operating CREV does not change the amount of flow brought in from the outside or the amount that is exhausted.
	D	Operating CREV does not change the amount of flow brought in from the outside or the amount that is exhausted.

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

<b>Source Documentation</b>		
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> Other Exam Bank: () <input type="checkbox"/> ILT Exam Bank	
Reference(s):	M-384; SO 40D.5.A; SO 40D.7.B	
Learning Objective:	PLOT-5040D-5b	
K/A System:	290003 – Control Room HVAC	Importance: RO / SRO 2.5 / 2.8
K/A Statement: A1.04 – Ability to predict and/or monitor changes in parameters associated with operating the Control Room HVAC controls including: Control room pressure.		
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>	
Notes and Comments:		

34. An electric ATWS exists on Unit 2.

The Reactor Operator is directed to perform T-220-2 "Driving Control Rods During a Failure to Scram".

Prior to implementing this procedure, the Rod Worth Minimizer (RWM) loses power.

Which one of the following describes (1) the impact of this power loss on control rod insertion and (2) the action required by T-220-2 to insert control rods?

- A. (1) Control rod insertion is prevented  
(2) Bypass the RWM AND place the Rod Control switch (3A-S2) in the "IN" position
- B. (1) Control rod insertion is prevented  
(2) Bypass the RWM AND place the Emergency In / Notch Override switch (3A-S3) in the "EMERG ROD IN" position
- C. (1) Control rod insertion is NOT be prevented  
(2) Place the Rod Control switch (3A-S2) in the "IN" position
- D. (1) Control rod insertion is NOT be prevented  
(2) Place the Emergency In / Notch Override switch (3A-S3) in the "EMERG ROD IN" position



35. The following conditions exist on Unit 2:

- An ATWS is in progress
- SLC has NOT been initiated
- Reactor pressure is being controlled with RWCU in the Recirc Mode
- T-227-2 “Defeating RWCU Isolation Interlocks” has been completed
- A pipe break occurs in the suction line of the operating RWCU pump, causing RPV level to lower

Based on these conditions, the RWCU System will \_\_\_\_\_.

- A. isolate on low RPV level
- B. isolate on high system flow
- C. remain in service until T-227 is restored
- D. remain in service unless SBLC is initiated



36. A LOCA has occurred on Unit 2. RPV water level is now reading -150 inches on LR-110A blue pen at the 20C004C RCIC Panel.

Based on the above conditions, which one of the following process parameters is providing this recorder level indication?

Level is sensed by the \_\_\_\_\_.

- A. LT-72C, Wide Range level transmitter
- B. LT-73C, Fuel Zone level transmitter
- C. LT-112, Wide Range level transmitter
- D. LT-113, Fuel Zone level transmitter



37. Which one of the following is the reason ON-100 "Failure of a Jet Pump" directs a plant shutdown if a jet pump failure has been confirmed.
- A. Invalid heat balance due to inaccurate Recirc flow measurement
  - B. Invalid LOCA analysis due to potential for a displaced jet pump mixer
  - C. Unknown effect on core power distribution due to Recirc loop flow mismatch
  - D. Potential for violating thermal limits due to inaccurate Recirc flow measurement

<b>Answer Key</b>		
<b>Question # 37 RO</b>		
Choice	Basis or Justification	
Correct:	B	This is the reason given in ON-100 Bases—operation with a displaced jet pump mixer is not part of the licensing basis. Per Tech Spec 3.4 Bases, jet pump operability is an implicit assumption in the design basis loss of coolant accident analysis.
Distractors:	A	This is not the reason given in ON-100 Bases. Plausible since various mass flow rates are part of the heat balance equation (although recirc flow is not among them).
	C	This is not the reason given in ON-100 Bases. Plausible since recirc loop flow mismatch is an ON-100 concern (requiring reference to Tech Spec 3.4.2, which is also based on LOCA analysis assumptions).
	D	This is not the reason given in ON-100 Bases. Plausible since inaccurate recirc flow measurement could negatively impact thermal limit calculations.

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

<b>Source Documentation</b>		
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> Other Exam Bank: () <input type="checkbox"/> ILT Exam Bank	
Reference(s):	ON-100 Bases; Tech Spec 3.4 Bases	
Learning Objective:	PLOT-PBIG-1550-3	
K/A System:	202001 – Recirculation System	Importance: RO / SRO 3.9 / 4.0
K/A Statement: G2.1.27 – Knowledge of system purpose and/or function.		
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>	
Notes and Comments:	This question meets the K/A since it requires knowledge of the purpose/function of Recirculation System jet pumps from an accident analysis/plant safety perspective.	

38. Given the following:

- Fuel loading is in progress on Unit 2
- The first 3 fuel assemblies of a fuel cell are fully seated in the correct core locations and are in the correct orientation
- The 4th fuel assembly loaded in this cell is fully seated into its correct core location, but is inadvertently oriented 180 degrees from its correct position

Which one of the following would be the result of operating the reactor with this condition?

- A. Reduced core flow through the fuel assembly
- B. Unmonitored violations of core thermal limits
- C. Inaccurate calibration of LPRMs using the TIP System
- D. Reduced core bypass flow to cool in-core instrumentation



39. Unit 2 was initially operating at 100% power when the 2A Reactor Recirculation pump tripped. Current plant conditions are as follows:

- APRM power level is oscillating 58% to 69%
- OPRM Pretrip Condition alarms (211 B-5) are being received repetitively

Which one of the following actions is required?

- A. Insert GP-9-2 Appendix 1 rods ONLY.
- B. Manually scram the reactor and enter the T-100 "Scram".
- C. Raise the speed of the operating Recirculation pump to suppress the APRM oscillations.
- D. Insert ALL GP-9-2 rods, followed by NF-AB-720-1 approved sequence rods, as required to stop the power oscillations.

<b>Answer Key</b>		
<b>Question # 39 RO</b>		
Choice	Basis or Justification	
Correct:	D	OT-112 step 2.2 (Immediate Action) requires insertion of all GP-9-2 control rods on a Recirc pump trip. Step 2.5 (also Immediate Action) directs monitoring for THI and inserting GP-9-2 rods followed by NF-AB-720-1 rods until THI no longer exists. At this stage of the transient, the operator cannot determine if GP-9-2 rods alone will be sufficient.
Distractors:	A	This action is required when a Recirc pump trips, but it is not the only action required in this case since APRM flux oscillations exceed 10% peak-to-peak, indicating THI.
	B	This action is required when NO Recirc pumps are operating, or when APRM flux oscillations exceed 15% peak-to-peak.
	C	Raising Recirc pump speed is one of the options for exiting Region 2 of the P-F Map, but NOT a THI suppression action.

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

<b>Source Documentation</b>			
Source:	<input type="checkbox"/> New Exam Item <input checked="" type="checkbox"/> Modified Bank Item <input checked="" type="checkbox"/> ILT Exam Bank		<input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	OT-112; GP-5-1; ARC-211 B-5		
Learning Objective:	PLOT-PBIG-1540-1, -3, -4		
K/A System:	295001 – Partial or Complete Loss of Forced Core Flow Circulation	Importance: RO / SRO 2.5 / 3.3	
K/A Statement: AK1.04 – Knowledge of the operational implications of the following concepts as they apply to Partial or Complete Loss of Forced Core Flow Circulation: Limiting cycle oscillation.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

40. Unit 2 is operation in Mode 4 when a sustained loss of shutdown cooling occurs.

Which of the following is the reason ON-125 “Loss of Shutdown Cooling” directs raising RPV level to above +50 inches?

- A. Provides sufficient NPSH for placing a Recirculation pump in service.
- B. Satisfies Technical Specification requirements for reactor coolant circulation.
- C. Promotes natural circulation and helps prevent stagnation of coolant in the core.
- D. Establishes a longer “time to boil” while aligning alternate decay heat removal systems.

<b>Answer Key</b>		
Question # 40 RO		
Choice	Basis or Justification	
Correct:	C	Per ON-125 Bases, raising level to above the separators (> +50 inches) promotes natural circulation, which will prevent stagnation (thermal stratification) of reactor coolant.
Distractors:	A	Not the basis per ON-125. In addition, +50 inches is more than is required for recirculation pump NPSH.
	B	Per ON-125, raising RPV level to +50 inches does NOT satisfy Tech Spec requirements for reactor coolant circulation. This can only be satisfied by restoring forced circulation (i.e., a Recirc or RHR pump must be in service).
	D	Not the basis per ON-125. In addition, adding inventory has only a minor impact on time to boil, which is primarily based on decay heat load.

<b>Psychometrics</b>			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY	2.5	3	10CFR55.41(b)(10)

<b>Source Documentation</b>			
Source:	<input type="checkbox"/> New Exam Item <input checked="" type="checkbox"/> Modified Bank Item <input checked="" type="checkbox"/> ILT Exam Bank		<input checked="" type="checkbox"/> Previous NRC Exam: (PB 2002) <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	ON-125 and Bases		
Learning Objective:	PLOT-1550-28c		
K/A System:	295021 – Loss of Shutdown Cooling	Importance:	RO / SRO 3.3 / 3.4
K/A Statement: AK1.02 – Knowledge of the operational implications of the following concepts as they apply to Loss of Shutdown Cooling: Thermal stratification.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

41. Unit 2 is operating with the following conditions:

- Main Generator volts: 22.0 KV
- Main Generator MW: 1100 MWe
- Main Generator VARS: 120 MVARs
- Hydrogen pressure: 60 psig

A grid disturbance results in steadily lowering grid voltage.

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

With no operator action, this transient could result in \_\_\_\_\_.

Figure 1 of AO 50.7-2 “Generator Capability Curve” is PROVIDED SEPARATELY.

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



42. Refueling movements are in progress on Unit 2.

Which one of the following unanticipated conditions is symptomatic of a refueling event requiring action in accordance with ON-124 “Fuel Floor and Fuel Handling Problems”?

- A. FUEL STORAGE POOL HI LEVEL alarms on local Panel 20C075.
- B. 2 UNIT REFUELING FLOOR AREA HI RADIATION (003 B-4) alarms.
- C. An irradiated LPRM detector is dropped in the ISFSI Cask Handling Area.
- D. REFUELING FLOOR VENT EXHAUST HI RADIATION (218 A-1) alarms.

<b>Answer Key</b>		
<b>Question # 42 RO</b>		
Choice		Basis or Justification
Correct:	B	ON-124 requires entry and action for any Fuel Floor ARM alarm.
Distractors:	A	This alarm does not require entry into ON-124. Note that receiving a "Fuel Storage Pool Hi Radiation" alarm, or indications associated with a loss of Spent Fuel Pool water inventory (e.g., lowering level), do require entry into ON-124.
	C	ON-124 entry is required for a fuel assembly or single fuel rod dropped or damaged, but not for an LPRM detector.
	D	Although this condition obviously requires action, it is not an entry condition into ON-124.

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

<b>Source Documentation</b>		
Source:	<input type="checkbox"/> New Exam Item <input checked="" type="checkbox"/> Modified Bank Item <input checked="" type="checkbox"/> ILT Exam Bank	<input checked="" type="checkbox"/> Previous NRC Exam: (PB 2005) <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	ON-124	
Learning Objective:	PLOT-PBIG-1550-2	
K/A System:	295023 – Refueling Accidents	Importance: RO / SRO 3.4 / 3.6
K/A Statement: AK2.03 – Knowledge of the interrelations between Refueling Accidents and the following: Radiation Monitoring Equipment.		
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>	
Notes and Comments:		

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

- Reactor power is 2E-02%
- Rod 22-51 is at position “02”
- Rod 50-31 is at position “48”
- All other control rods are at “00”

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

The reactor \_\_\_\_ (1) \_\_\_\_ shutdown; an ATWS \_\_\_\_ (2) \_\_\_\_ in progress.

- A. (1) is  
(2) is
- B. (1) is  
(2) is NOT
- C. (1) is NOT  
(2) is
- D. (1) is NOT  
(2) is NOT

<b>Answer Key</b>		
<b>Question # 43 RO</b>		
Choice	Basis or Justification	
Correct:	A	Per T-101 NOTE 23, the reactor is shutdown if it is know to be subcritical with reactor power below 1%. Per T-101 NOTE 24, ATWS criteria stipulate that if any single rod is withdrawn (at '48' in this case), all other rods must be fully inserted. Having one rod at '48' and another rod at '02' does not meet these criteria.
Distractors:	B	An ATWS is in progress.
	C	The reactor is shutdown.
	D	The reactor is shutdown; an ATWS is in progress.

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

<b>Source Documentation</b>		
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> ILT Exam Bank	<input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	T-101 (Notes 23 and 24)	
Learning Objective:	PLOT-PBIG-2100-T101-4, -6	
K/A System:	295006 – Scram	Importance: RO / SRO 4.2 / 4.3
K/A Statement:	AK2.06 – Knowledge of the interrelationship between Scram and the following: Reactor power.	
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>	
Notes and Comments:		

44. Unit 2 was operating at 100% power when a large break occurred in the Torus.

As Torus level lowers, which one of the following describes when the LOCA downcomer vents and the SRV tailpipes will become uncovered?

	<u>LOCA Downcomer Vents</u>	<u>SRV Tailpipes</u>
A.	12.5 feet	7 feet
B.	12.5 feet	6 feet
C.	10.5 feet	7 feet
D.	10.5 feet	6 feet

<b>Answer Key</b>		
<b>Question # 44 RO</b>		
Choice	Basis or Justification	
Correct:	C	Per T-102 Bases, the LOCA downcomer vents are uncovered at 10.5 feet. Per T-112 Bases, the SRV tailpipes are uncovered at 7 feet.
Distractors:	A	12.5 feet is when T-102 requires a reactor scram and RPV depressurization due to low torus level.
	B	12.5 feet is when T-102 requires a reactor scram and RPV depressurization due to low torus level.
	D	6 feet is the RCIC vortex limit.

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

<b>Source Documentation</b>			
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> ILT Exam Bank		<input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	T-102 Bases; T-112 Bases		
Learning Objective:	PLOT-1560-9		
K/A System:	295030 – Low Suppression Pool Water Level	Importance:	RO / SRO 3.5 / 3.8
K/A Statement: EK2.08 – Knowledge of the interrelationships between Low Suppression Pool Water Level and the following: SRV discharge submergence.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

45. 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. Drywell Spray Initiation Limit
- B. Heat Capacity Temperature Limit
- C. Pressure Suppression Pressure Limit
- D. Primary Containment Pressure Limit



46. Given the following:

- A startup is in progress on Unit 3 with reactor power at 5%
- Panel 30Y033 is inadvertently de-energized, resulting in a loss of power to portions of PCIS logic

Which of the following RWCU System containment isolation valves close as a result of this event?

1. MO-3-12-15, Cleanup Inlet Isolation-Inboard
2. MO-3-12-18, Cleanup Inlet Isolation-Outboard
3. MO-3-12-68, Cleanup Outlet Isolation

- A. 1 ONLY
- B. 2 ONLY
- C. 2 and 3 ONLY
- D. 1, 2, and 3



47. According to the UFSAR, which one of the following statements describes the reason for disabling control room controls IAW SE-10 “Plant Shutdown from the Alternative Shutdown Panels” after abandoning the control room?
- A. To prevent High Pressure Coolant Injection (HPCI) System automatic operation.
  - B. To ensure interlocks associated with operation of safe shutdown equipment are defeated.
  - C. To ensure fire-induced circuit faults will NOT prevent operation of safe shutdown equipment.
  - D. To prevent simultaneous operation from the control room and the Alternative Shutdown Panels.



48. A fire occurred in the Main Control Room requiring evacuation. The following conditions exist on Unit 2:

- The crew is executing SE-10 “Plant Shutdown from the Alternative Shutdown Panels”
- The URO is performing SE-10 Sheet 2 to establish control at the HPCI Alternative Shutdown Panel

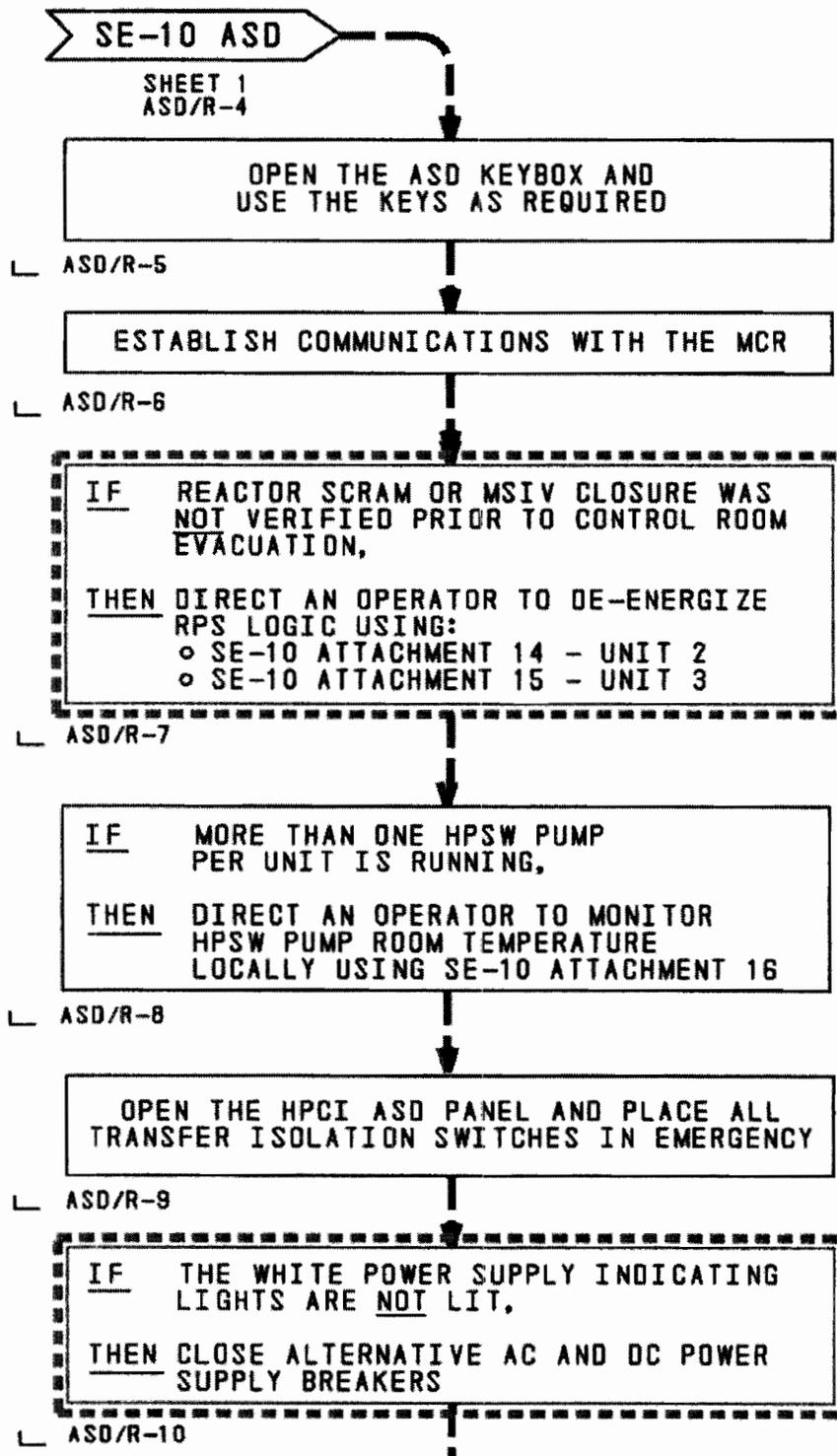
After placing the transfer isolation switch for the HPCI Aux Oil Pump to EMERGENCY, the URO observes the white power supply indicating light for the HPCI Aux Oil Pump is lit.

Which statement below is correct for these conditions?

A portion of SE-10 Sheet 2 is PROVIDED ON THE NEXT PAGE.

The white power supply indicating light shows that the \_\_\_\_ (1) \_\_\_\_ source of DC \_\_\_\_ (2) \_\_\_\_ power is available to the HPCI Aux Oil Pump.

- A. (1) normal  
(2) control
- B. (1) normal  
(2) operating
- C. (1) alternate  
(2) control
- D. (1) alternate  
(2) operating



<b>Answer Key</b>		
<b>Question # 48 RO</b>		
Choice	Basis or Justification	
Correct:	A	Per SE-10 Bases Step ASD/R-10; normal (DC) control power is not available if the white power supply is not lit, and closing the alternate (DC) supply breaker establishes a separate and independent source of control power for the labeled component. As long as a (DC) power supply is present as indicated by the white light, the switch is not operated to prevent cross-tying normal and alternate (DC) power supplies.
Distractors:	B	The white light provides indication of control power status; not operating power. Plausible if applicant believes the transfer isolation switches align component operating power vice control power.
	C	The white light indicates that normal control power is available and there is no need to close the alternate power supply breaker. Plausible if applicant does not understand what is being accomplished by these steps of SE-10.
	D	The white light indicates that normal control power is available and there is no need to close the alternate power supply breaker. In addition, the white light provides indication of control power status; not operating power. Plausible if applicant believes the transfer isolation switches align component operating power vice control power, or does not understand what is being accomplished by these steps of SE-10.

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

<b>Source Documentation</b>			
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> ILT Exam Bank		<input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	SE-10 Bases		
Learning Objective:	PLOT-1555-12		
K/A System:	295016 – Control Room Abandonment	Importance:	RO / SRO 2.8 / 2.9
K/A Statement: AA1.05 – Ability to operate and/or monitor the following as it applies to Control Room Abandonment: D.C. electrical distribution.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

49. Given the following:

- A radiological accident condition has occurred at Peach Bottom
- 2 VENT EXH STACK RAD MONITOR HI/TROUBLE A (218 B-5) alarms
- 2 VENT EXH STACK RAD MONITOR HI/TROUBLE B (218 C-5) alarms
- Unit 2 Vent Stack Radiation is reading  $2 \times 10^{-5}$   $\mu\text{Ci/cc}$  and rising

Which one of the following could be the source of the radiation release?

- A. Standby Gas Treatment Exhaust
- B. PEARL Building Ventilation Exhaust
- C. Radwaste Building Ventilation Exhaust
- D. Recombiner Building Ventilation Exhaust

<b>Answer Key</b>		
<b>Question # 49 RO</b>		
Choice		Basis or Justification
Correct:	C	Radwaste Building Ventilation exhausts to the Unit 2 vent stack.
Distractors:	A	SBG T exhausts to the main stack.
	B	The Recombiner Building exhausts to the Unit 3 vent stack.
	D	The PEARL Building exhausts to the Unit 3 vent stack.

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

<b>Source Documentation</b>			
Source:	<input type="checkbox"/> New Exam Item <input checked="" type="checkbox"/> Modified Bank Item <input checked="" type="checkbox"/> ILT Exam Bank		<input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	ON-104 and Bases		
Learning Objective:	PLOT-1550-9a		
K/A System:	295038 – High Offsite Release Rate	Importance:	RO / SRO 3.9 / 4.2
K/A Statement: EA1.01 – Ability to operate and/or monitor the following as it applies to High Offsite Release Rate: Stack-gas monitoring system.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

50. During an ATWS condition, the URO initiated the 'B' Standby Liquid Control (SBLC) System using RRC 11.1-2 "SBLC System Initiation During a Plant Event".

The following conditions exist:

- RPV pressure is 1020 psig
- SBLC discharge pressure is 1400 psig

Which statement below is correct for these conditions?

- A. SBLC is injecting at full flow.
- B. SBLC is injecting at reduced flow.
- C. SBLC is NOT injecting; initiate System 'A'.
- D. SBLC is NOT injecting; do NOT initiate System 'A'.



51. Unit 2 was operating at 100% power when a Loss of Coolant Accident occurred. The following conditions currently exist:

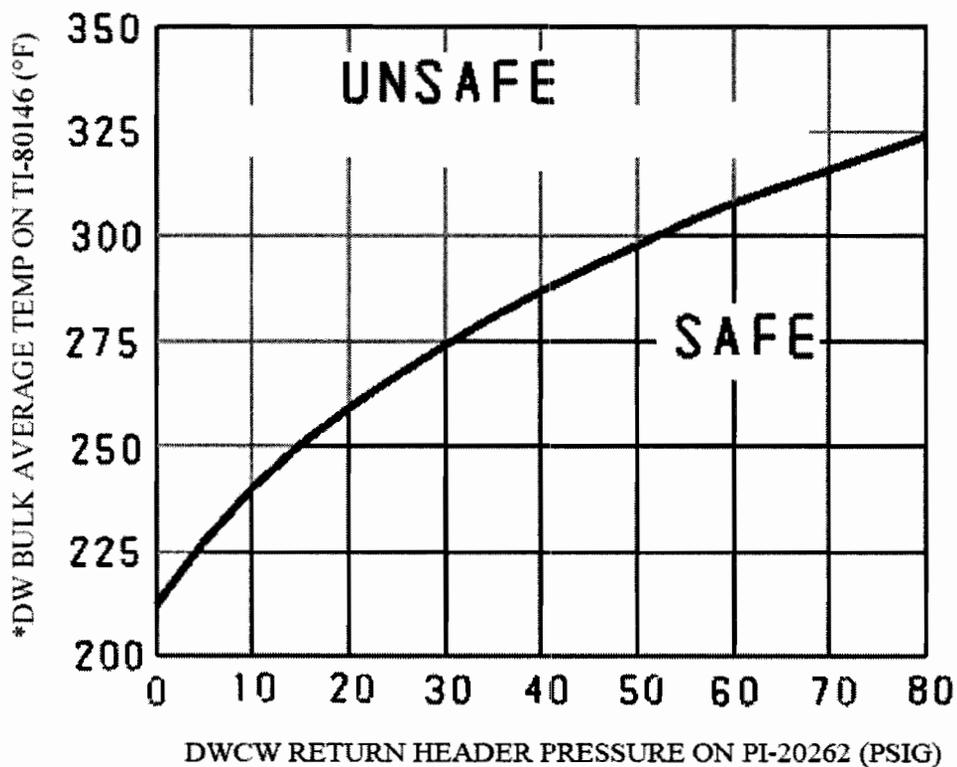
- Drywell pressure is 6 psig
- Drywell sprays are not available
- Drywell bulk average temperature is 275 degrees F
- Drywell coolers are being supplied by Drywell Chilled Water (DWCW)
- DWCW return header pressure is 28 psig
- The Reactor and Radwaste Buildings are not accessible
- T-223-2 “Drywell Cooler Fan Bypass” is being implemented

T-223-2 Figure 1 is PROVIDED ON THE NEXT PAGE.

Based on these conditions, the Drywell Cooler Fans \_\_\_\_\_.

- A. may be restarted in “Slow” speed ONLY
- B. may be restarted in “Slow” or “Fast” speed
- C. cannot be restarted until Reactor Building access is restored
- D. cannot be restarted until an Engineering evaluation is obtained

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.

<b>Answer Key</b>		
<b>Question # 51 RO</b>		
Choice	Basis or Justification	
Correct:	D	Drywell cooler fan units cannot be restarted since operation of the coolers plots on the UNSAFE side of the Drywell Chilled Water Saturation Curve (T-223 Figure 1). Per step 4.1 of T-223, operation must be verified to be on the safe side of the curve, or an engineering evaluation must be obtained, prior to starting (or restarting) any drywell cooler fan unit.
Distractors:	A	Plausible since T-223 states the drywell cooler fans should be started in SLOW speed if drywell pressure is above 0.75 psig.
	B	Plausible since T-223 states the drywell cooler fans should be started in SLOW speed if drywell pressure is above 0.75 psig, but allows starting the fans in FAST speed if the local fan speed control switches are not accessible (as is the case here).
	C	Plausible since the local fan speed control switches are not accessible.

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

<b>Source Documentation</b>			
Source:	<input type="checkbox"/> New Exam Item <input checked="" type="checkbox"/> Modified Bank Item <input checked="" type="checkbox"/> ILT Exam Bank		<input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	T-223		
Learning Objective:	PLOT-1560-4		
K/A System:	295028 – High Drywell Temperature	Importance: RO / SRO 4.0 / 4.1	
K/A Statement: EA2.01 – Ability to determine and/or interpret the following as it applies to High Drywell Temperature: Drywell temperature.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

52. The following conditions exist on Unit 3:

- The crew is executing T-111 “Level Restoration”
- RPV level is -190 inches and slowly lowering
- RPV pressure is 550 psig and slowly lowering
- An emergency depressurization is in progress with 5 SRVs open
- The 3A Core Spray pump is the only available source of injection

Based on these conditions, Adequate Core Cooling (ACC) is \_\_\_\_\_.

- A. NOT being maintained
- B. being maintained by core submergence
- C. being maintained by spray cooling
- D. being maintained by steam cooling

<b>Answer Key</b>		
<b>Question # 52 RO</b>		
Choice	Basis or Justification	
Correct:	D	When RPV water level cannot be maintained above TAF (-172 inches), adequate steam flow (cooling) is established by maintaining RPV water level above the Minimum Steam Cooling RPV Water Level (-195 inches), as long as RPV pressure is above the Minimum Steam Cooling Pressure (270 psig with 5 SRVs open).
Distractors:	A	ACC is being maintained by steam cooling. Plausible if applicant does not recognize steam cooling conditions are met.
	B	The core is adequately cooled by submergence when it can be determined that RPV level is at or above TAF (-172 inches). Plausible if applicant associates TAF with -195 inches.
	C	Adequate spray cooling is provided when design spray flow requirements are satisfied (at least 6250 gpm from one Core Spray loop) and RPV water level is at or above the elevation of the jet pump suctions (-226 inches).

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

<b>Source Documentation</b>			
Source:	<input type="checkbox"/> New Exam Item <input checked="" type="checkbox"/> Modified Bank Item <input type="checkbox"/> ILT Exam Bank		<input type="checkbox"/> Previous NRC Exam: () <input checked="" type="checkbox"/> Other Exam Bank: (LORT)
Reference(s):	T-BAS (Intro); TRIP/SAMP Curves, Tables & Limits Bases; T-111 and Bases		
Learning Objective:	PLOT-5014-3a		
K/A System:	295031 – Reactor Low Water Level	Importance: RO / SRO 4.6 / 4.8	
K/A Statement: EA2.04 – Ability to determine and/or interpret the following as it applies to Reactor Low Water Level: Adequate core cooling.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

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

- Turbine control valves swing partially closed then back open
- REACTOR HI PRESS (210 G-2) alarm is received
- Reactor power initially rises then returns to the pre-transient level
- Reactor pressure peaks at ~1065 psig then returns to the pre-transient level

Which one of the following actions is required by OT-102 “Reactor High Pressure” 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. Maintain reactor pressure  $\leq 1035$  psig with EHC Pressure Set.



54. Which one of the following correctly shows the impact of a loss of power to 125 VDC Power Distribution Panels 20D021 (Unit 2) or 30D021 (Unit 3)?

Loss of power to Panel \_\_\_\_ (1) \_\_\_\_ results in the following equipment being unavailable: \_\_\_\_ (2) \_\_\_\_.

- |                   |   |
|-------------------|---|
| A. 20D021 (Div I) | Unit 2 HPCI<br>2A Core Spray Pump<br>3A Core Spray Pump               |
| B. 20D021 (Div I) | E-1 Diesel<br>Unit 2 RCIC<br>2A Core Spray Pump<br>3A Core Spray Pump |
| C. 30D021 (Div I) | Unit 3 HPCI<br>2A Core Spray Pump<br>3A Core Spray Pump               |
| D. 30D021 (Div I) | E-1 Diesel<br>Unit 3 RCIC<br>2A Core Spray Pump<br>3A Core Spray Pump |

<b>Answer Key</b>		
<b>Question # 54 RO</b>		
Choice	Basis or Justification	
Correct:	B	Per SE-13, a loss of 20D021 results in a loss (inoperability) of Unit 2 RCIC, the E-1 diesel the 2A and 3A Core Spray pumps (and other loads).
Distractors:	A	Unit 2 HPCI is powered from Division II 125 VDC Panel 20D022. The E-1 diesel is also inoperable on a loss of Panel 20D021. Plausible since there is cross-tying of DC power supplies between units for ECCS related equipment.
	C	Unit 3 HPCI is powered from Division II 125 VDC Panel 30D022. The 2A Core Spray pump is not impacted by a loss of 30D021, although the 3A Core Spray pump is. Plausible since there is cross-tying of DC power supplies between units for ECCS related equipment.
	D	Of the items listed, only Unit 3 RCIC is affected by a loss of Panel 30D021. Plausible since other Unit 3 DC panels (30D023 and 30DD306) do impact diesel generators and Core Spray pumps.

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

<b>Source Documentation</b>		
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> ILT Exam Bank	<input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	SE-13	
Learning Objective:	PLOT-5057-3	
K/A System:	295004 – Partial or Complete Loss of D.C. Power	Importance: RO / SRO 3.8 / 3.9
K/A Statement: G2.2.3 – Knowledge of the design, procedural, and operational differences between units.		
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>	
Notes and Comments:		

55. Given the following:

- A AIR COMP TROUBLE (216 B-1) alarm is received
- The 'A' Air Compressor (2AK001) indicates "tripped" on Panel 20C012
- Investigation shows the 'A' Air Compressor tripped on high receiver pressure
- 'A' Instrument Air Receiver (2AT006) pressure is currently 105 psig

Which one of the following is correct regarding reset of the 'A' Air Compressor trip?

- A. Air receiver pressure does NOT allow the air compressor trip to be reset.
- B. Air receiver pressure allows the air compressor trip to automatically reset.
- C. The trip can only reset by depressing the "Reset-Start" button locally at the compressor.
- D. The trip can only be reset by placing the compressor control switch to STOP at Panel 20C012.

<b>Answer Key</b>		
<b>Question # 55 RO</b>		
Choice	Basis or Justification	
Correct:	C	Per ARC-216 B-1, a high receiver pressure trip occurs at 120 psig. Since normal system pressure is 100 to 115 psig, current receiver pressure (105 psig) allows compressor reset. Per the NOTE in ARC-216 B-1, a compressor trip can only be reset locally by depressing the "Reset-Start" button located at the tripped compressor.
Distractors:	A	Per ARC-216 B-1, a high receiver pressure trip occurs at 120 psig. Since normal system pressure is 100 to 115 psig, current receiver pressure (105 psig) allows compressor reset.
	B	Per the NOTE in ARC-216 B-1, a compressor trip can only be reset locally by depressing the "Reset-Start" button located at the tripped compressor.
	D	Per the NOTE in ARC-216 B-1, a compressor trip can only be reset locally by depressing the "Reset-Start" button located at the tripped compressor.

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

<b>Source Documentation</b>			
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> ILT Exam Bank		<input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	ARC-216 B-1		
Learning Objective:	PLOT-5036-		
K/A System:	295019 – Partial or Complete Loss of Instrument Air	Importance:	RO / SRO 3.0 / 3.0
K/A Statement: G2.4.50 – Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

56. Unit 2 was operating at 100% power when Drywell pressure began to rise. The crew entered OT-101 “High Drywell Pressure”.

At 1.2 psig Drywell pressure the crew performed GP-4 “Manual Reactor Scram”.

Which one of the following identifies how OT-101 is required to be used in conjunction with T-101 “RPV Control” and/or T-102 “Primary Containment Control”?

At 2 psig Drywell pressure the crew must \_\_\_\_\_.

- A. Exit OT-101 and enter T-101
- B. Exit OT-101 and enter T-101 and T-102
- C. Enter T-101 and execute concurrently with OT-101
- D. Enter T-101 and T-102 and execute concurrently with OT-101

<b>Answer Key</b>		
<b>Question # 56 RO</b>		
Choice	Basis or Justification	
Correct:	D	Per OT-101, "Follow-up Action" step 3.3, if drywell pressure reaches 2.0 psig, enter and execute concurrently T-101 and T-102. Per OT-101 Bases, this is because OT-101 provides further direction for mitigating the consequences of the high drywell pressure condition.
Distractors:	A	OT-101 must be executed concurrently with T-101 and T-102.
	B	OT-101 must be executed concurrently with T-101 and T-102.
	C	T-102 must also be entered and executed concurrently with OT-101.

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

<b>Source Documentation</b>			
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> ILT Exam Bank		<input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	OT-101 and Bases		
Learning Objective:	PLOT-2102-3		
K/A System:	295024 – High Drywell Pressure	Importance:	RO / SRO 4.2 / 4.0
K/A Statement: G2.4.8 – Knowledge of how abnormal operating procedures are used in conjunction with EOPs.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

57. Given the following:

- Unit 3 is operating at 100% power
- A “Feedwater Controller Failure - Maximum Demand” transient occurs as described in the Updated Final Safety Analysis Report (UFSAR)
- RPV water level rises at a rate of 2 inches per second

Assuming no operator actions, one minute later the reactor recirculation pumps will be \_\_\_\_\_.

- A. tripped
- B. operating at 30% speed
- C. operating at 45% speed
- D. operating at the initial speed



58. Given the following conditions:

- Unit 3 was initially operating at 100% power
- 3A TBCCW pump tripped due to a motor fault
- 3B TBCCW pump is blocked

Which one of the following describes the impact on continued power operations?

- A. A Reactor power reduction will be required due to loss of Stator Water Cooling.
- B. A Reactor power reduction will be required due to loss of Isophase Bus Cooling.
- C. An immediate plant shutdown will be required due to loss of cooling to the CRD pumps.
- D. An immediate plant shutdown will be required due to loss of cooling to the Condensate pumps.



59. Unit 2 was operating at 100% power for 6 months when the crew scrammed the reactor due to a loss of main condenser vacuum. The following conditions exist shortly after the scram:

- HPCI is unavailable
- RPV level is 30 inches
- RPV pressure is 930 psig
- Vacuum is 7" and degrading

With no operator action, reactor pressure will initially \_\_\_\_ (1) \_\_\_\_ as a result of \_\_\_\_ (2) \_\_\_\_.

- A. (1) rise  
(2) MSIV closure
- B. (1) rise  
(2) Bypass Valve closure
- C. (1) lower  
(2) RPV cooldown
- D. (1) lower  
(2) Bypass Valve operation

<b>Answer Key</b>		
<b>Question # 59 RO</b>		
Choice	Basis or Justification	
Correct:	B	Bypass valves automatically close at 7" Hg vacuum, which results in a loss of the main condenser as a heat sink. With no operator action, RPV pressure will rise due to decay heat.
Distractors:	A	Automatic MSIV closure does not occur on a loss of main condenser vacuum. Plausible since OT-106 directs manual closure of MSIVs at 5" Hg vacuum.
	C	Based on 6 months of operation at 100% power, there is sufficient decay heat to cause reactor pressure to rise.
	D	Bypass valves automatically close at 7" Hg vacuum. Since the given conditions state that vacuum has lowered to 6" Hg, bypass valves are already closed.

<b>Psychometrics</b>			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
HIGH			10CFR55.41(b)(5)

<b>Source Documentation</b>			
Source:	<input type="checkbox"/> New Exam Item <input checked="" type="checkbox"/> Modified Bank Item <input checked="" type="checkbox"/> ILT Exam Bank		<input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	OT-106		
Learning Objective:	PLOT-1540-5		
K/A System:	295002 – Loss of Main Condenser Vacuum	Importance:	RO / SRO 3.6 / 3.8
K/A Statement: AK1.03 – Knowledge of the operational implications of the following concepts as they apply to Loss of Main Condenser Vacuum: Loss of heat sink.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

60. Unit 2 was operating at 100% power when Drywell pressure began to rise. The crew entered OT-101 “High Drywell Pressure”.

At 1.2 psig Drywell pressure the crew performed GP-4 “Manual Reactor Scram”. The following conditions currently exist:

- RPV level is -5 inches and is being controlled per T-100 “Scram”
- Drywell pressure is 1.5 psig and slowly rising
- All PRO and URO scram actions have been completed
- No other actions have been performed

Which one of the following is the pneumatic supply to the ADS valves under these conditions?

- A. Backup Instrument Air Supply
- B. Backup Instrument Nitrogen bottles
- C. Backup Instrument Nitrogen from CAD
- D. Instrument Nitrogen Compressors “A” and/or “B”

<b>Answer Key</b>		
<b>Question # 60 RO</b>		
Choice	Basis or Justification	
Correct:	A	Based on the given conditions, a Group II/III isolation signal occurred due to low RPV level (-1 inch). This results in an isolation of the N2 compressor suction valves and the N2 receiver supply to the A and B drywell headers. Since all PRO scram actions are complete, the A and B drywell header isolation valves have been bypassed and reopened per RRC 94.2-2, aligning the N2 receivers to drywell loads. As N2 receiver pressure lowers to 85 psig, the Backup Instrument Air isolation valves will automatically open to re-pressurize the receivers and supply drywell pneumatic loads.
Distractors:	B	Backup Instrument Nitrogen from N2 bottles to ADS SRVs is not permitted in T-100; only from T-101 "RPV Control" (there are no given T-101 entry conditions) and only if specifically directed to be aligned (not part of the URO or PRO scram actions).
	C	Backup Instrument Nitrogen from CAD is not permitted in T-100; only from T-101 "RPV Control". Since drywell pressure has not reached 2 psig and RPV level is well above -48 inches, there are no T-101 entry conditions.
	D	N2 compressors A and B tripped due to the loss of suction generated by the Group III isolation signal (-1 inch).

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

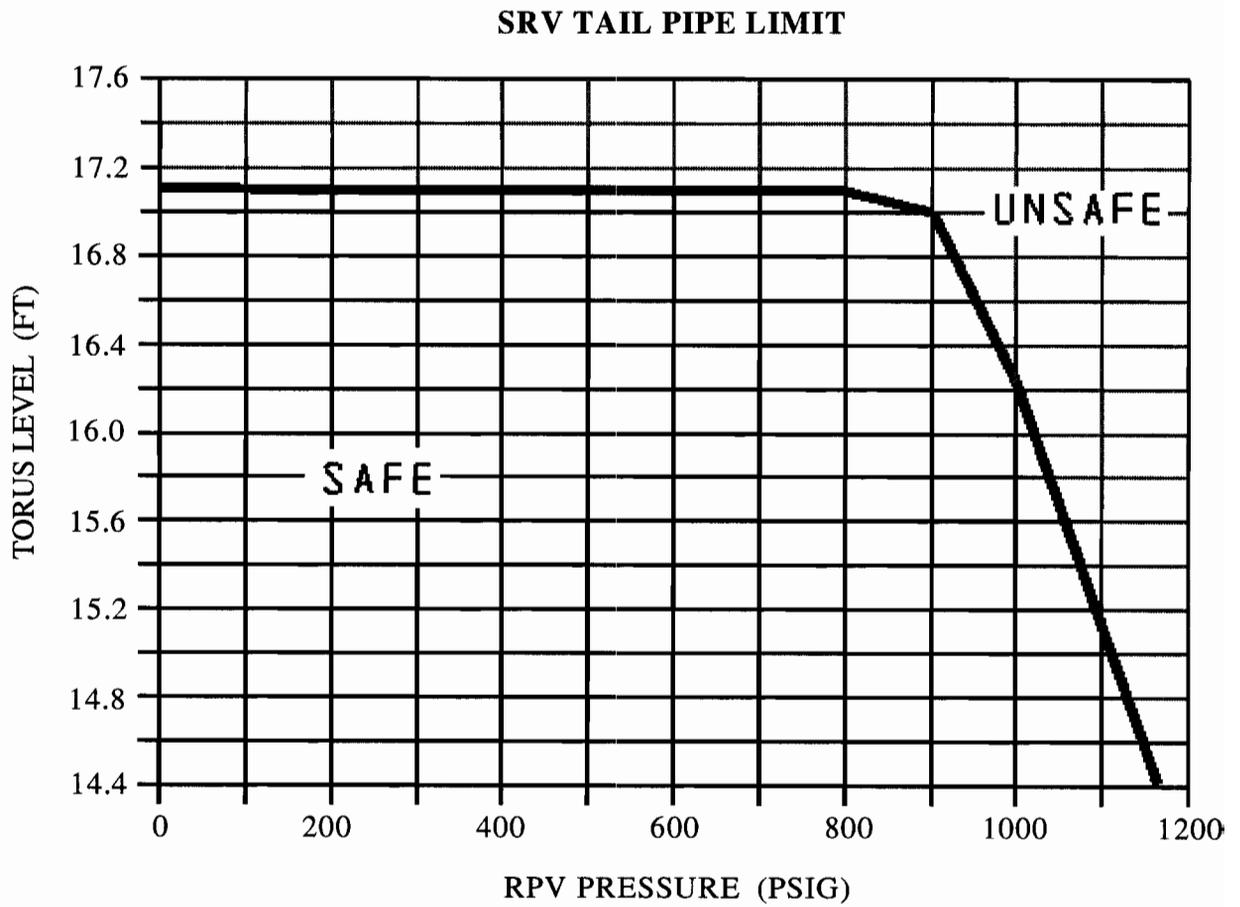
<b>Source Documentation</b>		
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> Other Exam Bank: () <input type="checkbox"/> ILT Exam Bank	
Reference(s):	T-100; GP-8.B; GP-8.E; RRC 94.2-2	
Learning Objective:	PLOT-5016-1	
K/A System:	295010 – High Drywell Pressure	Importance: RO / SRO 2.6 / 2.8
K/A Statement: AK2.04 – Knowledge of the interrelationships between High Drywell Pressure and the following: Nitrogen makeup system.		
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>	
Notes and Comments:		

61. A high Torus water level condition exists on Unit 3.

In accordance with T-102 "Primary Containment Control", Torus level is being lowered in an attempt to maintain below Curve T/L-1 "SRV Tail Pipe Limit" (provided on the NEXT PAGE).

The reason Torus level is maintained below the "SRV Tail Pipe Limit" curve is to prevent \_\_\_\_\_.

- A. exceeding the Torus level Tech Spec Limiting Condition for Operation
- B. flooding the Safety Relief Valve solenoids, rendering the SRVs inoperable
- C. direct pressurization of the Primary Containment without pressure suppression
- D. covering the highest vent capable of passing all of the decay heat from the reactor





62. Given the following:

- Unit 2 is operating at 100% power
- The 2A CRD pump is blocked for maintenance
- The 2B CRD pump tripped on motor overload

Which one of the following describes the impact, if any, on RWCU System operation?

- A. No impact; RWCU operation may continue.
- B. RWCU must be shutdown to prevent pump damage due to loss of seal cooling.
- C. RWCU must be shutdown to minimize pump motor area contamination due to loss of purge supply.
- D. RWCU flow must be maximized in preparation for a reactor scram and trip of both Recirc pumps.

<b>Answer Key</b>		
<b>Question # 62 RO</b>		
Choice		Basis or Justification
Correct:	C	RWCU shutdown is required by ON-107 if CRD restoration is not imminent. This is to minimize radioactive contamination of the RWCU pump motor area due to the loss of RWCU pump seal purge supply.
Distractors:	A	RWCU shutdown is required by ON-107 if CRD restoration is not imminent.
	B	Correct action; wrong reason. Plausible since this is the reason Recirc pumps may have to be shutdown on a loss of CRD; applicant could confuse Recirc pump seal purge with RWCU recirc pump seal purge.
	D	Plausible since a sustained loss of CRD will require a reactor scram and may require shutdown of both Recirc pumps. Under these conditions, maximizing RWCU flow is directed by T-100 "Scram".

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

<b>Source Documentation</b>			
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> ILT Exam Bank		<input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	ON-107 Bases		
Learning Objective:	PLOT-5014-6g		
K/A System:	295022 – Loss of CRD Pumps	Importance: RO / SRO 2.5 / 2.6	
K/A Statement: AA1.04 – Ability to operate and/or monitor the following as it applies to Loss of CRD Pumps: Reactor Water Cleanup System.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

63. During Refuel Floor operations on Unit 2 the Control Room receives the following alarms and indications:

- REFUELING FLOOR VENT EXHAUST HI RADIATION (218 A-1)
- REAC BLDG ZONE VENT EXHAUST HI RADIATION (218 B-1)
- REAC BLDG OR REFUELING FLOOR VENT EXH HI RAD TRIP (218 D-4)
- Refueling Floor Radiation Trip Units RIS-2-17-458 A and D are both reading above 16 mR/hr

Which one of the following describes the ventilation system response to these conditions?

- A. Reactor Building Ventilation trips  
Refuel Floor Ventilation trips  
SBGT initiates and aligns to the Reactor Building and Refuel Floor
- B. Reactor Building Ventilation continues to run  
Refuel Floor Ventilation trips  
SBGT initiates and aligns to the Refuel Floor
- C. Reactor Building Ventilation trips  
Refuel Floor Ventilation continues to run  
SBGT initiates and aligns to the Reactor Building
- D. Reactor Building Ventilation continues to run  
Refuel Floor Ventilation continues to run  
SBGT remains in standby



64. Unit 2 is operating at 100% power when an inadvertent Group II/III isolation occurs due to a spurious low RPV level (+1 inch) signal.

Which one of the following describes the status of Drywell Chilled Water flow to the Drywell cooling units and Recirc pump motor coolers one minute later?

<u>Drywell Cooling</u>	<u>Recirc Pump Motor Cooling</u>
A. Isolated	Isolated
B. Isolated	In-service
C. In-service	Isolated
D. In-service	In-service



65. Given the following:

- Unit 3 is operating at 100% power
- A loss of feedwater heating occurs
- The crew enters OT-104 “Positive Reactivity Insertion”
- OT-104 directs lowering reactor power using GP-9-3 to at least 10% below the pre-transient power level

To comply with this step the operator must first \_\_\_\_ (1) \_\_\_\_\_. The reason for lowering power at least 10% is to \_\_\_\_ (2) \_\_\_\_\_.

- A. (1) insert control rods  
(2) provide margin to the full power thermal limits
- B. (1) insert control rods  
(2) avoid reaching an APRM rod block or scram setpoint
- C. (1) reduce Recirc flow  
(2) provide margin to the full power thermal limits
- D. (1) reduce Recirc flow  
(2) avoid reaching an APRM rod block or scram setpoint

<b>Answer Key</b>		
<b>Question # 65 RO</b>		
Choice	Basis or Justification	
Correct:	C	Based on the initial conditions of 100% power, GP-9-3 will direct lowering Recirc flow <u>first</u> until either flow reaches ~61.5 Mlbm/hr, or an APRM HIGH alarm occurs. Per OT-104 Bases, the reason for lowering reactor power by at least 10% is to provide additional core thermal margin under potentially asymmetric feedwater heating conditions.
Distractors:	A	Incorrect first action – for these conditions, GP-9-3 directs lowering Recirc flow <u>first</u> until either flow reaches ~61.5 Mlbm/hr, or an APRM HIGH alarm occurs.
	B	Incorrect first action – for these conditions, GP-9-3 directs lowering Recirc flow <u>first</u> until either flow reaches ~61.5 Mlbm/hr, or an APRM HIGH alarm occurs. Incorrect bases – avoiding the APRM rod block and scram setpoints is not the bases for performing this step.
	D	Incorrect bases – avoiding the APRM rod block and scram setpoints is not the bases for performing this step.

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

<b>Source Documentation</b>		
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> Other Exam Bank: () <input type="checkbox"/> ILT Exam Bank	
Reference(s):	OT-104 and Bases; GP-9-3	
Learning Objective:	PLOT-PBIG-1550-3	
K/A System:	295014 – Inadvertent Reactivity Addition	Importance: RO / SRO 4.3 / 4.4
K/A Statement: G2.1.23 – Ability to perform specific system and integrated plant procedures during all modes of plant operation.		
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>	
Notes and Comments:		

66. An Alert was declared on Unit 2 at 0330 hours.

As the Shift Communicator, which of the following is correct regarding notification of State and County Agencies in accordance with EP-MA-114-100 "Mid-Atlantic State/Local Notifications"?

- A. Place a NARS telephone call within 15 minutes.
- B. Place a NARS telephone call within 1 hour.
- C. Fax the Emergency Notification Worksheet within 15 minutes.
- D. Fax the Emergency Notification Worksheet within 1 hour.



67. Unit 3 is in MODE 5 with refueling activities in progress.

Which one of the following conditions requires the Reactor Operator to notify the Fuel Handling Director to suspend core alterations, in accordance with FH-6C “Core Component Movement – Core Transfers”?

- A. A FUEL POOL SERV WATER BOOSTER PUMP OVERCURRENT (216 C-5) alarm.
- B. Shutdown Cooling (SDC) has been removed from service to complete a swap of SDC loops.
- C. Wide Range neutron count rate doubles when a fifth fuel bundle is seated around the ‘A’ WRNM detector.
- D. The white rod permissive light on Panel 20C005 is NOT lit when the refuel platform is over the core with fuel loaded on the main hoist.



68. The Unit 2 Facility Operating License (# DPR-44) authorizes Exelon to operate the Peach Bottom Atomic Power Station at a steady state reactor core power level not to exceed \_\_\_\_\_ megawatts thermal.
- A. 3458
  - B. 3514
  - C. 3527
  - D. 3584



69. Unit 2 is operating at 100% power when the following events occur (all times are in seconds):

- T=0 - REACTOR HI-LO WATER LEVEL (210 H-2) alarms
- T=5 - URO attempts manual control of reactor water level
- T=15 - REACTOR WATER HI LEVEL TRIP (206 C-1) alarms
- T=15 - A RFPT TRIP (201 G-4) alarms
- T=15 - B RFPT TRIP (201 H-4) alarms
- T=15 - C RFPT TRIP (201 J-4) alarms
- T=20 - RPV level indicates +48 inches
- T=25 - RPV pressure is 1028 psig

What actions are required for these conditions?

- A. Perform GP-4 "Manual Reactor Scram".
- B. Scram the reactor and then trip the turbine.
- C. Trip the turbine and then scram the reactor.
- D. Scram the reactor and then close the MSIVs.



70. 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
- CONTROL ROOM VENT SUPPLY LO FLOW CREV START (003 A-5) is in alarm
- CONTROL ROOM RAD MONITOR DIV I INITIATED (003 A-2) is in alarm
- Flow Recorder FR-0765 indicates 200 scfm and lowering
- RIS-0760C “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



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

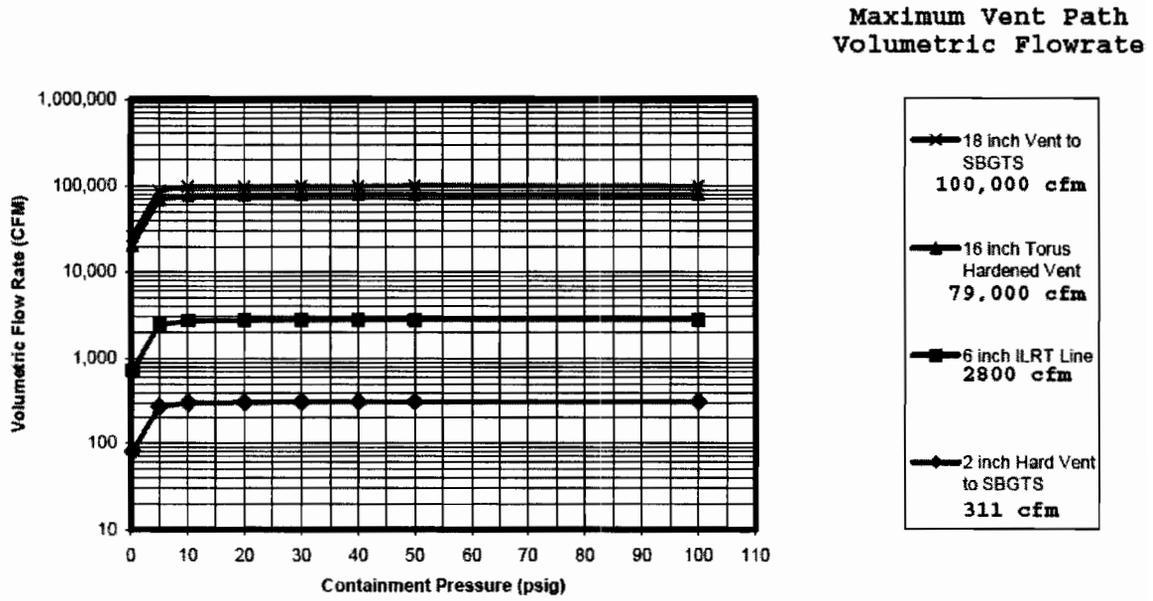
- Containment venting is required for combustible gas control using T-200-2 “Primary Containment Venting”
- Chemistry determined that the maximum Containment vent rate that will not exceed the General Emergency release rate is 2,000 scfm
- Drywell pressure on PR-2508 is 25 psig
- Standby Gas Treatment 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 # 71 RO		
Choice	Basis or Justification	
Correct:	A	Plot Containment pressure of 25 psig and vent rate of 2000 SFCM, the point is ABOVE the 2 in Hard Vent to SBGTS Line and BELOW the 6 inch ILRT Line; the 2 in Hard Vent to SBGTS is the largest vent path that will NOT exceed the GE release rate.
Distracters:	B	Plot Containment pressure of 25 psig and vent rate of 2000 SFCM, the point is ABOVE the 2 in Hard Vent to SBGTS Line and BELOW the 6 inch ILRT Line; the 2 in Hard Vent to SBGTS is the largest vent path that will NOT exceed the GE release rate. Plausible if plotted wrong or the candidate does not understand the curve.
	C	Plot Containment pressure of 25 psig and vent rate of 2000 SFCM, the point is ABOVE the 2 in Hard Vent to SBGTS Line and BELOW the 6 inch ILRT Line; the 2 in Hard Vent to SBGTS is the largest vent path that will NOT exceed the GE release rate. Plausible if plotted wrong or the candidate does not understand the curve.
	D	Plot Containment pressure of 25 psig and vent rate of 2000 SFCM, the point is ABOVE the 2 in Hard Vent to SBGTS Line and BELOW the 6 inch ILRT Line; the 2 in Hard Vent to SBGTS is the largest vent path that will NOT exceed the GE release rate. Plausible if plotted wrong or the candidate does not understand the curve.

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

Source Documentation			
Source:	<input type="checkbox"/> New Exam Item <input checked="" type="checkbox"/> Modified Bank Item <input checked="" type="checkbox"/> ILT Exam Bank	<input checked="" type="checkbox"/> Previous NRC Exam: (PB 2009) <input type="checkbox"/> Other Exam Bank: ()	
Reference(s):	T-102 and Bases		
Learning Objective:	PLOT-PBIG-2100-3		
K/A System:	G2.3 – Radiation Control	Importance:	RO / SRO 3.8 / 4.3
K/A Statement: G2.3.11 – Ability to control radiation releases.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

72. For an actual fire reported at Peach Bottom, which one of the following affected areas will REQUIRE entry into ON-114 “Actual Fire Reported in the...”?
- A. Inner Screen Structure
  - B. Water Treatment Plant
  - C. SU-25 Startup Switchgear House
  - D. Low Level Radwaste Storage Facility



73. In accordance with OP-AA-103-102 “Watchstanding Practices”, with no prior approval of the Control Room Supervisor, the Reactor Operator may prioritize/limit the announcement of Main Control Room annunciators to only those that the operator believes to be important \_\_\_\_\_.
- A. during a routine shift turnover meeting
  - B. following a planned change in plant conditions
  - C. during a planned HLA briefing prior to RPS testing
  - D. following a drywell leak and automatic reactor scram



74. An Equipment Operator (EO) has been assigned to enter the Moisture Separator Area to investigate a steam leak. The following information has been provided:

- The Equipment Operator has 3280 mRem TEDE annual Exposure
- Expected dose for investigation of the steam leak is 300 mRem

In accordance with RP-AA-203 “Exposure Control and Authorization”, which one of the following describes the action required, if any, to investigate the steam leak under these conditions?

- A. A Planned Special Exposure must be obtained
- B. A Dose Control Level Extension must be obtained
- C. An Emergency Exposure Extension must be obtained
- D. No action required since total exposure will be < 4000 mRem

<b>Answer Key</b>		
<b>Question # 74 RO</b>		
Choice	Basis or Justification	
Correct:	B	RP-AA-203 requires dose extension above 2000 mRem TEDE. Dose extensions are granted in 500 mRem increments. The current extension is good to 3500 mRem. Another extension is required to get to the 3580 mRem expected exposure.
Distractors:	A	This evolution does not qualify as a Planned Special Exposure, which is separate from and in addition to the annual exposure limits.
	C	This evolution does not require an Emergency Exposure Extension since the conditions do not rise to the level of "lifesaving or protecting valuable property".
	D	RP-AA-203 requires dose extension above 2000 mRem TEDE. Above 4000 mRem, Site Vice President approval is required.

<b>Psychometrics</b>			
Level of Knowledge	Difficulty	Time Allowance (minutes)	RO
MEMORY	2.5	3	10CFR55.41(b)(12)

<b>Source Documentation</b>			
Source:	<input type="checkbox"/> New Exam Item <input type="checkbox"/> Modified Bank Item <input checked="" type="checkbox"/> ILT Exam Bank		<input checked="" type="checkbox"/> Previous NRC Exam: (PB 2007) <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	RP-AA-203		
Learning Objective:	PLOT-1730-3		
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.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

75. Given the following conditions:

- A complete loss of off-site power has occurred
- RPV water level is -20 inches
- Drywell pressure is 6 psig
- All four Emergency Diesel Generators (EDGs) are running but do NOT have cooling water available
- The Control Room Supervisor directs you to shutdown the running Emergency Diesel Generators

In accordance with SE-11 “Loss of Off-site Power”, which one of the following describes how the EDGs are required to be shutdown?

- A. Install jumpers at each local EDG Gauge Panel.
- B. Depress the STOP Pushbutton on each local EDG Gauge Panel.
- C. Install jumpers in Main Control Room Panels 00C029A, B, C, and D.
- D. Place each EDG control switch in “Pull-to-Lock” at Main Control Room Panels 00C026A, B, C, and D.



76. Given the following conditions:

- Unit 2 is operating at 100% power
- 2A TBCCW pump is in service
- 2B TBCCW automatically starts
- TURB BLDG COOLING WATER SUPPLY LO PRESS (217 C-5) is received

Two minutes later, TBCCW system pressure on Panel 20C012 (PI-2229) is 25 psig.

Which one of the following is correct for these conditions?

TBCCW system pressure \_\_\_(1)\_\_\_; the CRS must direct the crew to \_\_\_(2)\_\_\_.

- A. (1) is low  
(2) reduce generator load to < 18,000 stator amps using GP-9-2 “Fast Reactor Power Reduction”
- B. (1) is low  
(2) perform a plant shutdown using GP-4 “Manual Reactor Scram” and remove Condensate pumps from service
- C. (1) is low  
(2) perform a plant shutdown using GP-4 “Manual Reactor Scram” and remove Station Air Compressors from service
- D. (1) has been restored  
(2) restore TBCCW pump lineup to normal using SO 34A.1.A-2 “TBCCW System Startup and Normal Operations”

<b>Answer Key</b>		
<b>Question # 76 SRO</b>		
Choice	Basis or Justification	
Correct:	A	Normal TBCCW system pressure on PI-2229 is ~ 100 psig. The standby TBCCW pump starts at 70 psig and a low pressure condition (217 C-5) is alarmed at 50 psig. Per ON-118, if TBCCW cooling cannot be restored (as is the case here) power must be reduced to < 18,000 stator amps IAW GP-9-2). This is done prior to securing both TBCCW pumps and transferring vital loads to RBCCW, since the Isolated Phase Bus coolers are not vital TBCCW loads.
Distractors:	B	Although a loss of TBCCW does result in a loss of cooling to Condensate pumps, ON-118 does not direct an immediate plant shutdown unless a unit trip is likely (imminent per ON-118 bases), which is not the case based on the given conditions. Instead, ON-118 directs monitoring Condensate pump temperatures and, if preset values are exceeded, removing the pumps from service, which first requires a power reduction using GP-9-2.
	C	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-4 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.
	D	TBCCW system pressure has not been restored.

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

<b>Source Documentation</b>		
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> ILT Exam Bank	<input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	ARC-217 C-5; 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 2.9
K/A Statement: AA2.05 – Ability to determine and/or interpret the following as it applies to Partial or Complete Loss of Component Cooling Water: System pressure.		
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>	
Notes and Comments:		

77. Unit 2 is operating at 100% power with rising Drywell pressure.

- The crew began venting the Drywell using SO 7B.3.A-2 “Containment Atmosphere Pressure Control and Nitrogen Makeup”
- The Reactor was scrammed at 1.1 psig Drywell pressure
- RPV level lowered to -10 inches following the scram; current RPV level is +20 inches
- Drywell pressure is now 1.2 psig and rising slowly

In order to reestablish Drywell venting, which one of the following is correct for monitoring Drywell radiation levels using the Primary Containment Radiation Gas Sampler (PCRGs)?

The PCRGs \_\_\_\_\_.

- A. is isolated; direct resetting the isolation using GP-8.B “PCIS Isolation Group II and III”
- B. is isolated; direct bypassing the isolation using GP-8.E “Primary Containment Isolation Bypass”
- C. is NOT isolated; direct manual isolation using GP-8.B “PCIS Isolation Group II and III” if drywell pressure exceeds 2 psig
- D. is NOT isolated; direct continuous monitoring of drywell radiation levels using SO 7B.3.A-2 “Containment Atmosphere Pressure Control and Nitrogen Makeup”



78. An ATWS is in progress on Unit 2.

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

The following conditions currently exist:

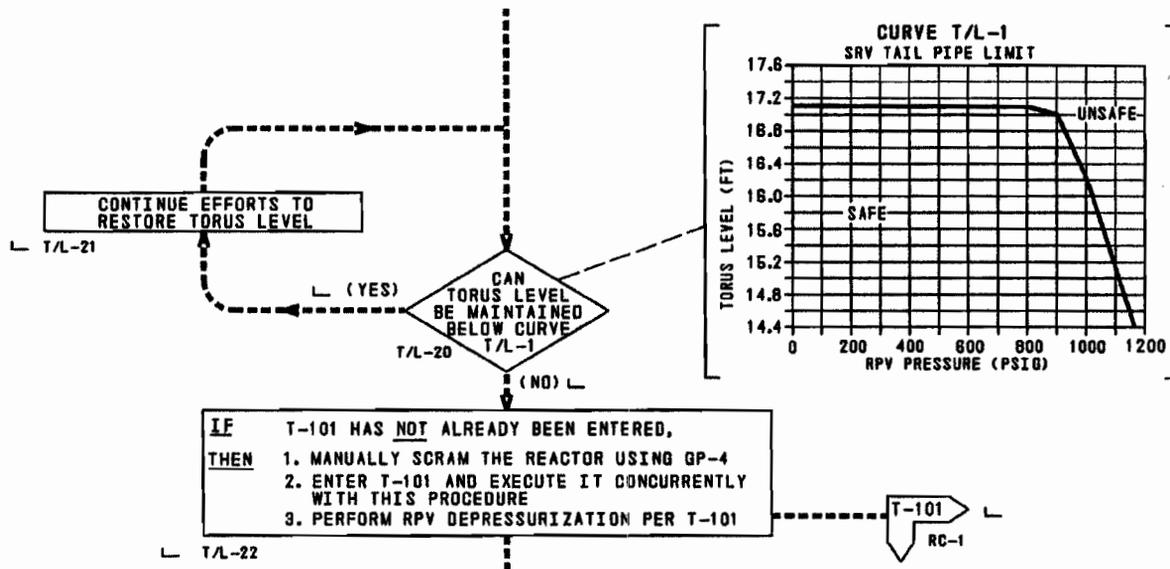
- Reactor power is 6%
- 1 SRV is stuck open
- RPV level is -200 inches and rising
- EHC is controlling RPV pressure at 950 psig
- Torus temperature is 180 degrees F and rising
- RHR loop 'A' is in Torus cooling; loop 'B' is unavailable
- Torus pressure is 6 psig and slowly rising
- Torus level is 16 feet and slowly rising
- HPCI is injecting at 5000 gpm

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

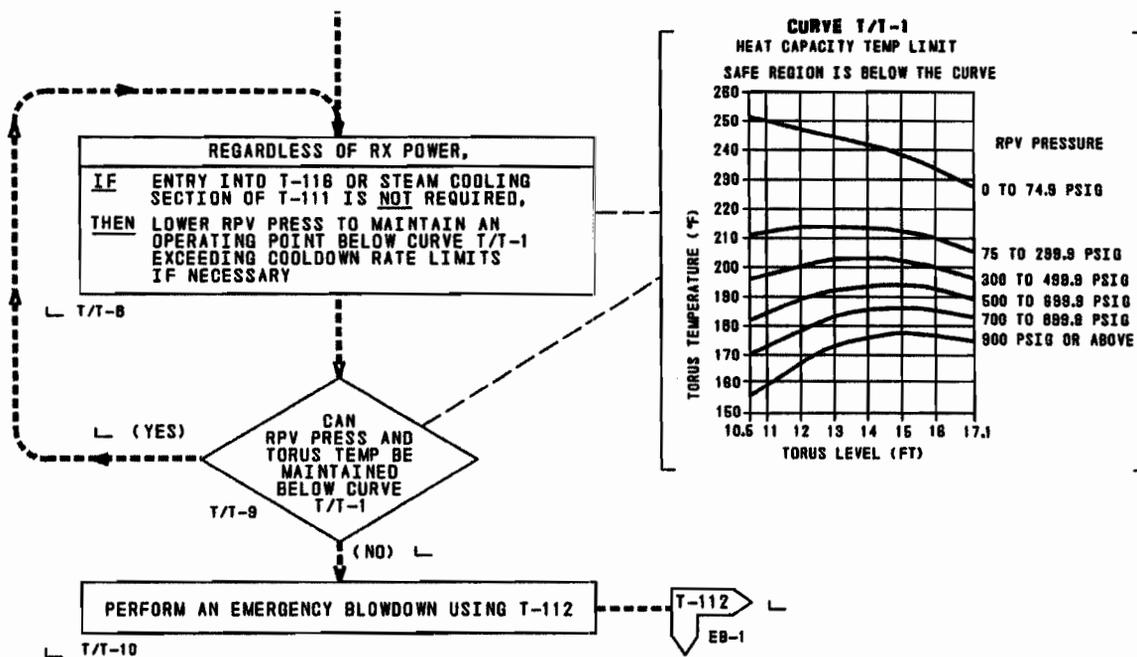
Portions of T-102 "Primary Containment Control" AND T-117 "Level/Power Control" are PROVIDED ON THE NEXT TWO PAGES.

- A. Perform Emergency Blowdown per T-112 due to inability to maintain RPV level above -195 inches.
- B. Reduce RPV pressure to less than 900 psig in order to maintain on the safe side of T/L-1 "SRV Tail Pipe Limit".
- C. Perform Emergency Blowdown per T-112 due to being on the unsafe side of T/T-1 "Heat Capacity Temperature Limit".
- D. Reduce RPV pressure to less than 900 psig in order to maintain on the safe side of T/T-1 "Heat Capacity Temperature Limit".

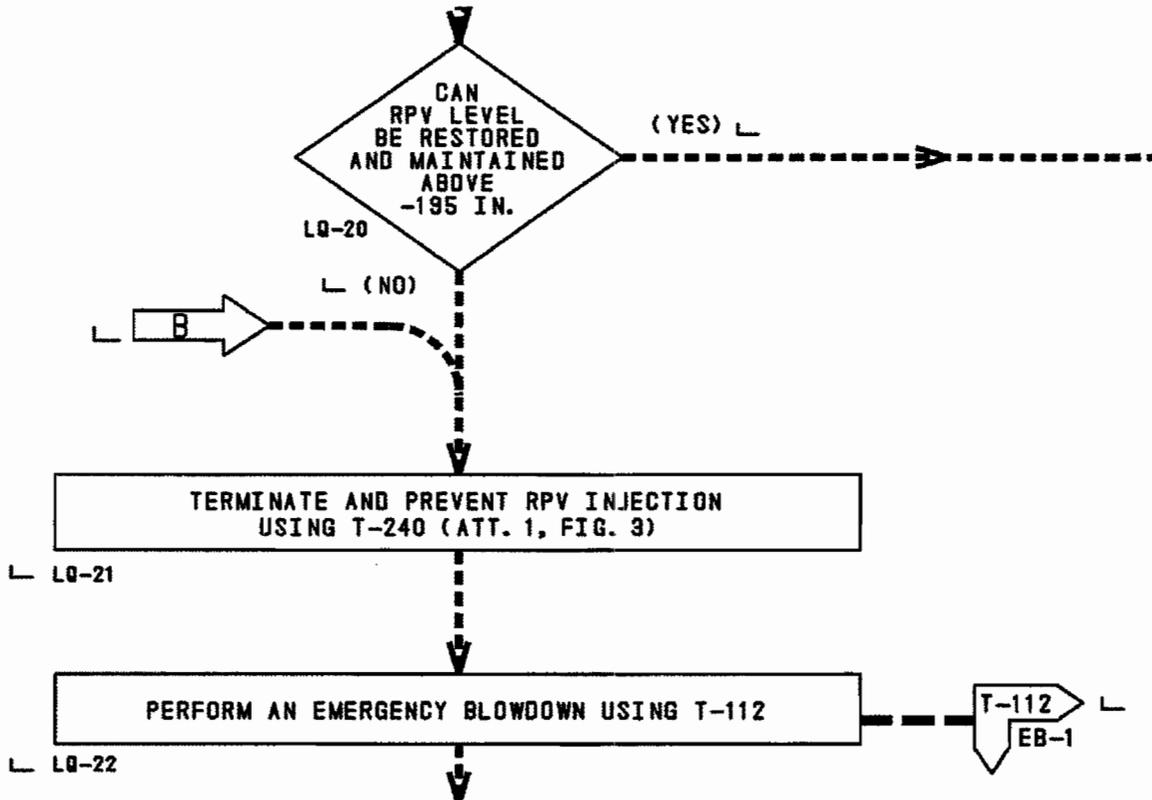
### T-102 "Primary Containment Control" "SRV Tail Pipe Limit" Curve



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



### T-117 "Level/Power Control"





79. Unit 2 was operating at 80% power with the OPRM System inoperable when the '2B' Recirc pump tripped. The following conditions currently exist:

- A loop flow (FI-2-2-3-092B) is 46 Mlbm/hr
- B loop flow (FI-2-2-3-092A) is 5 Mlbm/hr
- Indicated Core Flow (FR-2-2-3-095 black pen) is 51 Mlbm/hr
- APRMs are oscillating between 39 and 43% in 4-5 second random intervals

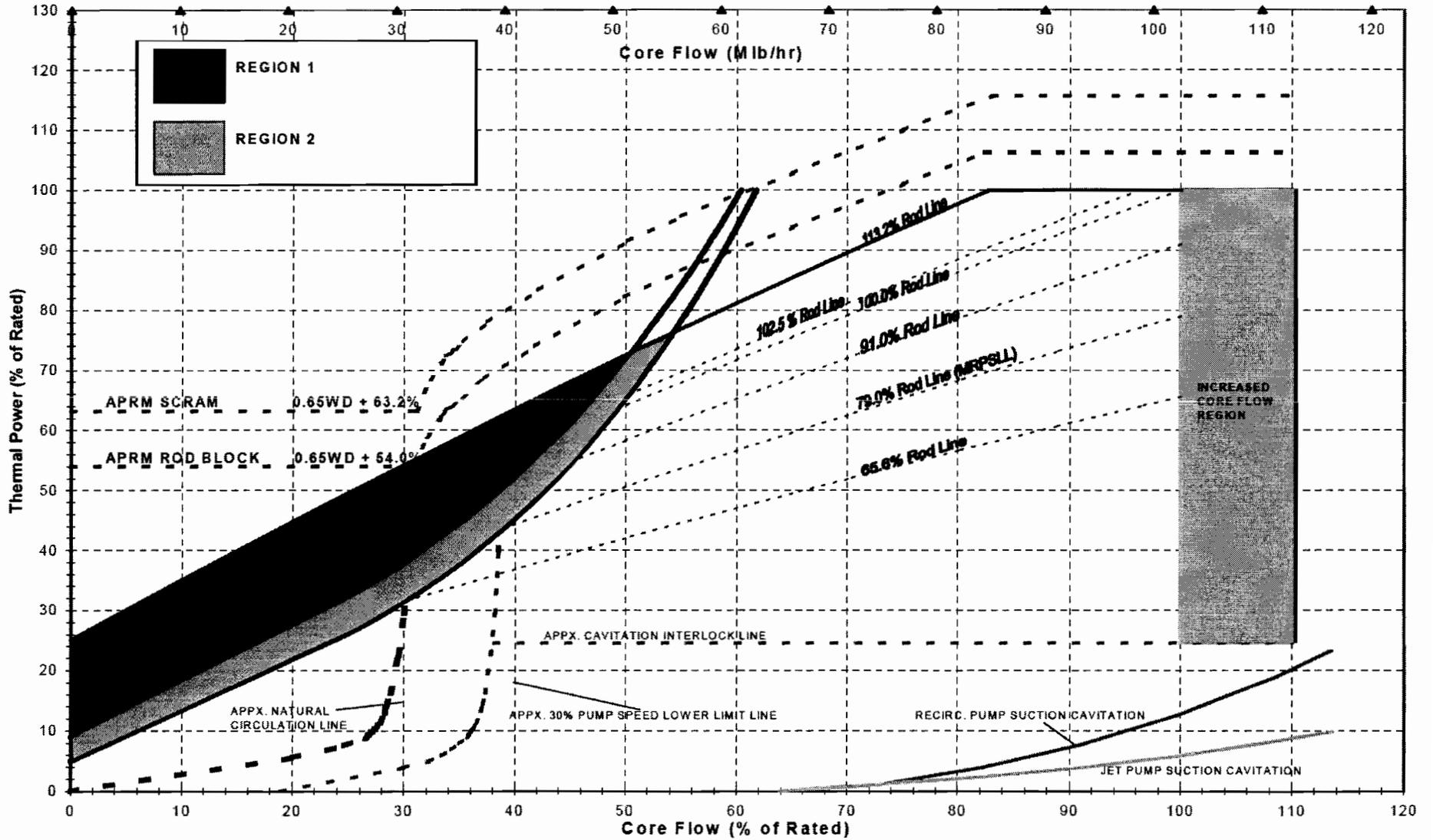
Which one of the following is correct for these conditions?

AO 60A.1-2 "PBAPS Backup Stability Solution Power Flow Operation Map" is PROVIDED ON THE NEXT PAGE.

The plant is operating in \_\_\_\_ (1) \_\_\_\_\_. The required action is to \_\_\_\_ (2) \_\_\_\_\_.

- A. (1) Region 1  
(2) scram the reactor and enter T-100 "Scram" due to being in Region 1
- B. (1) Region 2  
(2) insert all GP-9-2 control rods per GP-9-2 "Fast Reactor Power Reduction" due to indications of Thermal Hydraulic Instability
- C. (1) Region 2  
(2) exit Region 2 by raising '2A' Recirc pump speed using SO 2A.1.D-2 "Operation of the Recirc Pump Speed Control System"
- D. (1) the normal operating region  
(2) perform the follow-up actions of OT-112 "Unexpected/Unexplained Change in Core Flow"

ATTACHMENT 1  
PBAPS BACKUP STABILITY SOLUTION  
POWER FLOW OPERATION MAP



Answer Key		
Question # 79 SRO		
Choice	Basis or Justification	
Correct:	D	The calculation of core flow $51-2(5) = 41$ Mlbm/hr / 102.5 Mlbm/hr = 40% (alternatively, 41 Mlbm/hr can be found on the upper 'x' axis). Plotting 41 Mlbm/hr vs. 39-43% power shows the reactor is operating in the normal operating region. The follow-up actions of OT-112 are required.
Distractors:	A	If a core flow calculation error is made, the applicant could believe the reactor is operating in Region 1.
	B	If a core flow calculation error is made, the applicant could believe the reactor is operating in Region 2. The indications provided do not meet the criteria for THI, although inserting GP-9-2 rods would be a correct action if operating in Region 2.
	C	If a core flow calculation error is made, the applicant could believe the reactor is operating in Region 2. Raising recirc pump speed would be a correct action if operating in Region 2 without indications of THI.

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

Source Documentation			
Source:	<input type="checkbox"/> New Exam Item <input checked="" type="checkbox"/> Modified Bank Item <input checked="" type="checkbox"/> ILT Exam Bank		<input checked="" type="checkbox"/> Previous NRC Exam: (PB 2008) <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	OT-112; AO 60A.1-2		
Learning Objective:	PLOT-PBIG-1540-3, -4		
K/A System:	295001 – Partial or Complete Loss of Forced Core Flow Circulation	Importance:	SRO 3.8
K/A Statement: AA2.01 – Ability to determine and/or interpret the following as they apply to Partial or Complete Loss of Forced Core Flow Circulation: Power/flow map.			
REQUIRED MATERIALS:	AO 60A.1-2 “PBAPS Backup Stability Solution Power Flow Map” (whiteout “immediate exit” in upper left corner) – (imbedded)		
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.		

80. The following conditions exist:

- Both units were initially operating at 100% power
- A complete loss of offsite power (LOOP) occurred
- SE-11 “Loss of Off-Site Power” is being implemented
- Attachment U “Opening Secondary Containment Doors to Support Long Term HPCI / RCIC Operation” is required since HPCI Room Cooling is NOT available

For these conditions, which one of the following statements is correct regarding HPCI and RCIC operability per Technical Specification Bases?

- A. HPCI is operable without HPCI Room Coolers available.
- B. HPCI is NOT operable without HPCI Room Coolers available.
- C. HPCI is considered operable once Attachment U is implemented.
- D. Implementing Attachment U also causes RCIC to become inoperable.



81. Unit 2 was operating at full power when a small break Loss of Coolant Accident (LOCA) occurred. The following conditions currently exist:
- Torus level is 17 feet and rising
  - Torus pressure is 9.8 psig and rising
  - Drywell temperature indicated 165 degrees F before TI-80146 “Drywell Bulk Average Temperature Indicator” failed
  - Based on T-102 “Primary Containment Control” NOTE #27 below, the crew attempted to perform a manual calculation of Drywell Bulk Average Temperature using RT-O-40C-530-2 “Drywell Temperature Monitoring” but the calculation was invalid

#27

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

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

- A. Do NOT spray the Drywell since the safe side of the DWSIL curve cannot be verified per RT-O-40C-530-2.
- B. Do NOT spray the Drywell since Torus level may rise above the limit of T-102 “Primary Containment Control” for spraying the Drywell.
- C. Spray the Drywell per T-102 after verifying the safe side of the DWSIL curve using TI-2501, Point 136 plus 10 degrees F.
- D. Spray the Drywell per T-102 after verifying the safe side of the DWSIL Curve using the hottest temperature indicated on TI-2501, Points 119-127.

<b>Answer Key</b>		
<b>Question # 81 SRO</b>		
Choice	Basis or Justification	
Correct:	A	RT-O-40C-530-2 precaution 4.2.2 states that if the calculation of Drywell Bulk Average Temperature is invalid, the safe side of the DWSIL curve cannot be verified. <b>DO NOT SPRAY THE DRYWELL.</b>
Distractors:	B	Per T-102, the Torus level limit for spraying the Drywell is 18 feet. If Drywell sprays are required and all other conditions are met, Torus level at 17 feet and rising would not prevent spraying the Drywell.
	C	TI-2501, Point 136 (plus 10 degrees F) can be used to calculate approximate drywell temperature for entering ON-120 or T-102, but not for spraying the drywell.
	D	Using the hottest temperature from TI-2501 points 119-127 is an acceptable method of determining when to initiate RPV blowdown, but it is not acceptable for use on the DWSIL curve.

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

<b>Source Documentation</b>			
Source:	<input type="checkbox"/> New Exam Item <input checked="" type="checkbox"/> Previous NRC Exam: (PB 2008)		
	<input type="checkbox"/> Modified Bank Item <input type="checkbox"/> Other Exam Bank: ()		
	<input checked="" type="checkbox"/> ILT Exam Bank		
Reference(s):	T-102 (Note #27); RT-O-40C-530-2		
Learning Objective:	PLOT-1560-11		
K/A System:	295028 – High Drywell Temperature	Importance:	SRO 4.3
K/A Statement: G2.4.20 – Knowledge of the operational implications of EOP warnings, cautions and notes.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

82. Unit 2 was operating at 100% power when a Group I isolation occurred. The following conditions are present:

- All APRM downscale lights are lit
- 7 control rods remained at position '48' on the scram
- RPV water level lowered to -30 inches and is now -5 inches
- Torus temperature is 105 degrees F and rising slowly
- Drywell pressure is 0.7 psig and steady

What action is required when Torus temperature exceeds 110 degrees F?

T-117 "Level/Power Control" is PROVIDED SEPARATELY.

- A. Lower RPV water level to -60 inches
- B. Lower RPV water level to -172 inches
- C. Maintain RPV water level -195 to +35 inches
- D. Raise RPV water level; maintain +5 to +35 inches

Answer Key		
Question # 82 SRO		
Choice	Basis or Justification	
Correct:	C	The conditions given show that an ATWS is in progress per T-101, Note 24. Therefore, RPV level control is directed by T-117. With APRM downscalers are lit, reactor power is < 4%. Therefore, T-117 does not require lowering RPV water level. Step LQ-18 directs a water level control band of -195 to +35 inches (based on answering 'NO' at step LQ-17).
Distractors:	A	Based on answering 'YES' at step LQ-6 (power above 4%) and 'NO' at step LQ-10 (are any SRVs open—plausible if applicant does not recognize that SRVs would be open following a Group I isolation, which is indicated by rising Torus temperature).
	B	Based on answering 'YES' at step LQ-6 (power above 4%) and 'YES' at step LQ-10 (are any SRVs open—expected following a Group I isolation and is indicated by rising Torus temperature).
	D	Plausible since this is the level band directed by T-101, RC/L. However, RC/L is exited if an ATWS is in progress (step RC/L-2). Plausible if applicant does not recall T-101 RC/L direction.

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

Source Documentation			
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> ILT Exam Bank	<input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Other Exam Bank: ()	
Reference(s):	T-117		
Learning Objective:	PLOT-DBG-2117-9b		
K/A System:	295026 – Suppression Pool High Water 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, radioactive release control, etc.			
<b>REQUIRED MATERIALS:</b>	<b>T-117 “Level/Power Control”</b>		
Notes and Comments:			

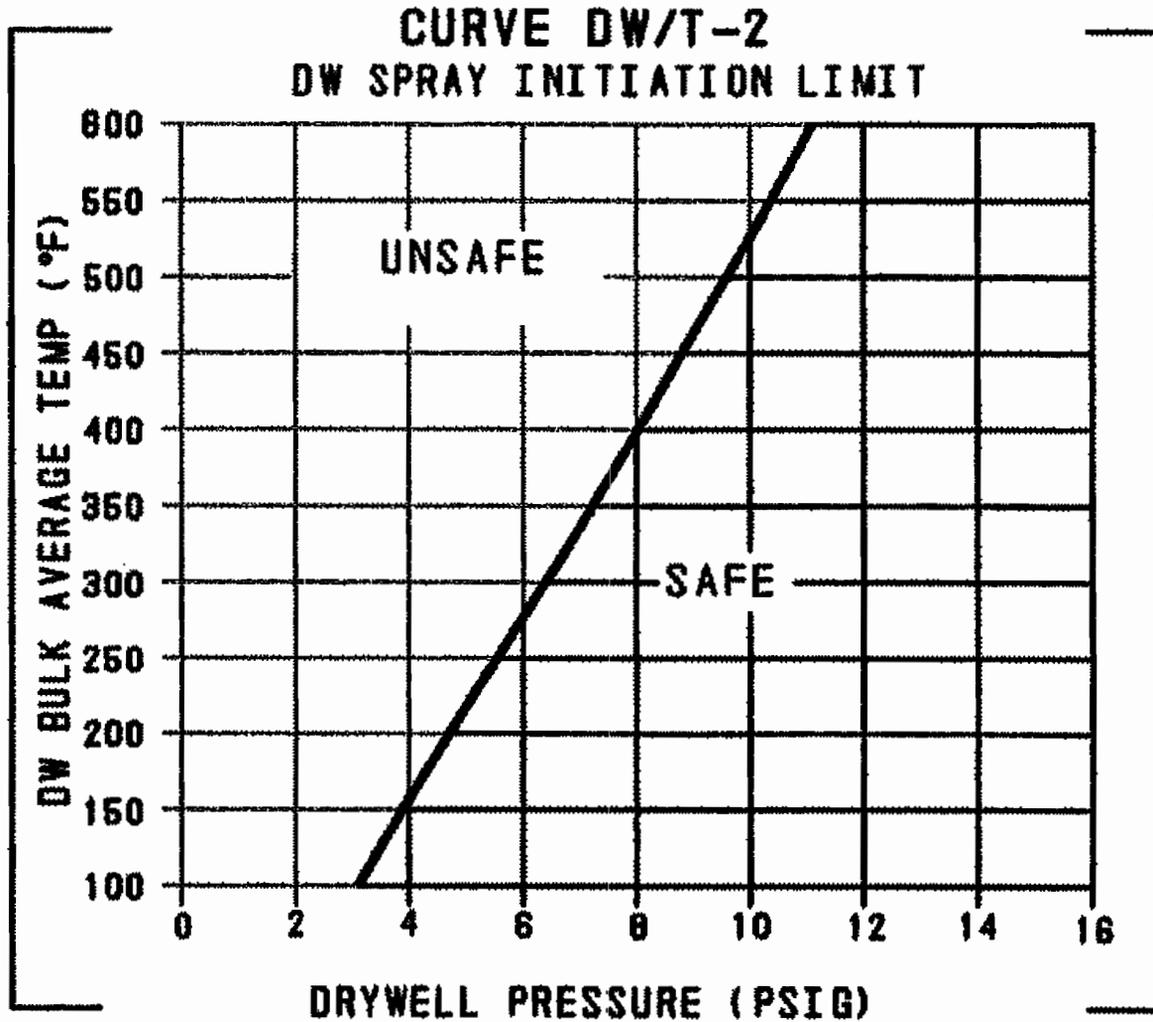
83. The following conditions exist on Unit 3:

- Drywell pressure is 5 psig
- Torus pressure is 4 psig
- Torus level is 15 feet
- Drywell bulk average temperature is 250 degrees F and rising
- Initiation of Torus Sprays using RHR per T-204 is complete

In accordance with T-102 "Primary Containment Control", spraying the drywell \_\_\_\_ (1) \_\_\_\_ because \_\_\_\_ (2) \_\_\_\_.

Drywell Spray Initiation Limit (DWSIL) Curve DW/T-2 is PROVIDED ON THE NEXT PAGE.

- A. (1) is allowed  
(2) the resulting evaporative cooling pressure drop can be controlled by throttling spray valves
- B. (1) is allowed  
(2) the resulting convective cooling pressure drop can be controlled by terminating spray flow
- C. (1) is NOT allowed  
(2) an evaporative cooling pressure drop to below the high drywell pressure scram setpoint may result
- D. (1) is NOT allowed  
(2) an evaporative cooling pressure drop greater than the capacity of the Reactor Building-to-Torus vacuum breakers may result



<b>Answer Key</b>		
<b>Question # 83 SRO</b>		
Choice	Basis or Justification	
Correct:	C	Drywell temperature and pressure plot on the <u>unsafe</u> side of the DWSIL curve. Per TRIP Bases, DWSIL is the highest drywell temperature at which initiation of sprays will not result in an evaporative cooling pressure drop to below the high drywell pressure scram setpoint. If drywell sprays are initiated while on the unsafe side of the DWSIL curve, the evaporative cooling pressure drop will reduce drywell pressure below the 2 psig scram setpoint. 2 psig provides margin to preclude containment failure or de-inertion following initiation of drywell sprays.
Distractors:	A	Part 1 is incorrect; part 2 is incorrect. Drywell temperature and pressure plot on the <u>unsafe</u> side of the DWSIL curve. Per T-102 Bases, initiation of drywell sprays can result in a relatively large drop in drywell pressure (due to evaporative cooling) that may occur at a rate faster than can be compensated by the operator. Spraying only when on the safe side of the DWSIL curve ensures this will not occur.
	B	Part 1 is incorrect; part 2 is correct (for different conditions). Drywell temperature and pressure plot on the <u>unsafe</u> side of the DWSIL curve. Per T-102 Bases, convective cooling occurs when water is sprayed into a saturated atmosphere (i.e., after evaporative cooling has occurred). Per T-102 Bases, convective cooling occurs at a much slower rate than evaporative cooling and can be controlled by terminating sprays.
	D	Part 1 is correct; part 2 is incorrect. Plausible since one of the assumptions for determining DWSIL is that the evaporative cooling transient is complete before the Torus-to-Drywell vacuum breakers operate (not the Reactor Building-to-Torus vacuum breakers), thereby ensuring sufficient margin to avoid de-inerting the primary containment when sprays are initiated.

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

<b>Source Documentation</b>			
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> Other Exam Bank: () <input type="checkbox"/> ILT Exam Bank		
Reference(s):	T-102 and Bases; TRIP/SAMP Curves, Tables & Limits Bases		
Learning Objective:	PLOT-1560-7, -9		
K/A System:	295012 – High Drywell Temperature	Importance:	SRO 4.1
K/A Statement: AA2.02 – Ability to determine and/or interpret the following as it applies to High Drywell Temperature: Drywell pressure.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

84. Unit 3 was operating at 100% power when a feedwater level control malfunction caused RPV level to rise to +90 inches as read on LI-2-2-3-86.

Current plant conditions are as follows:

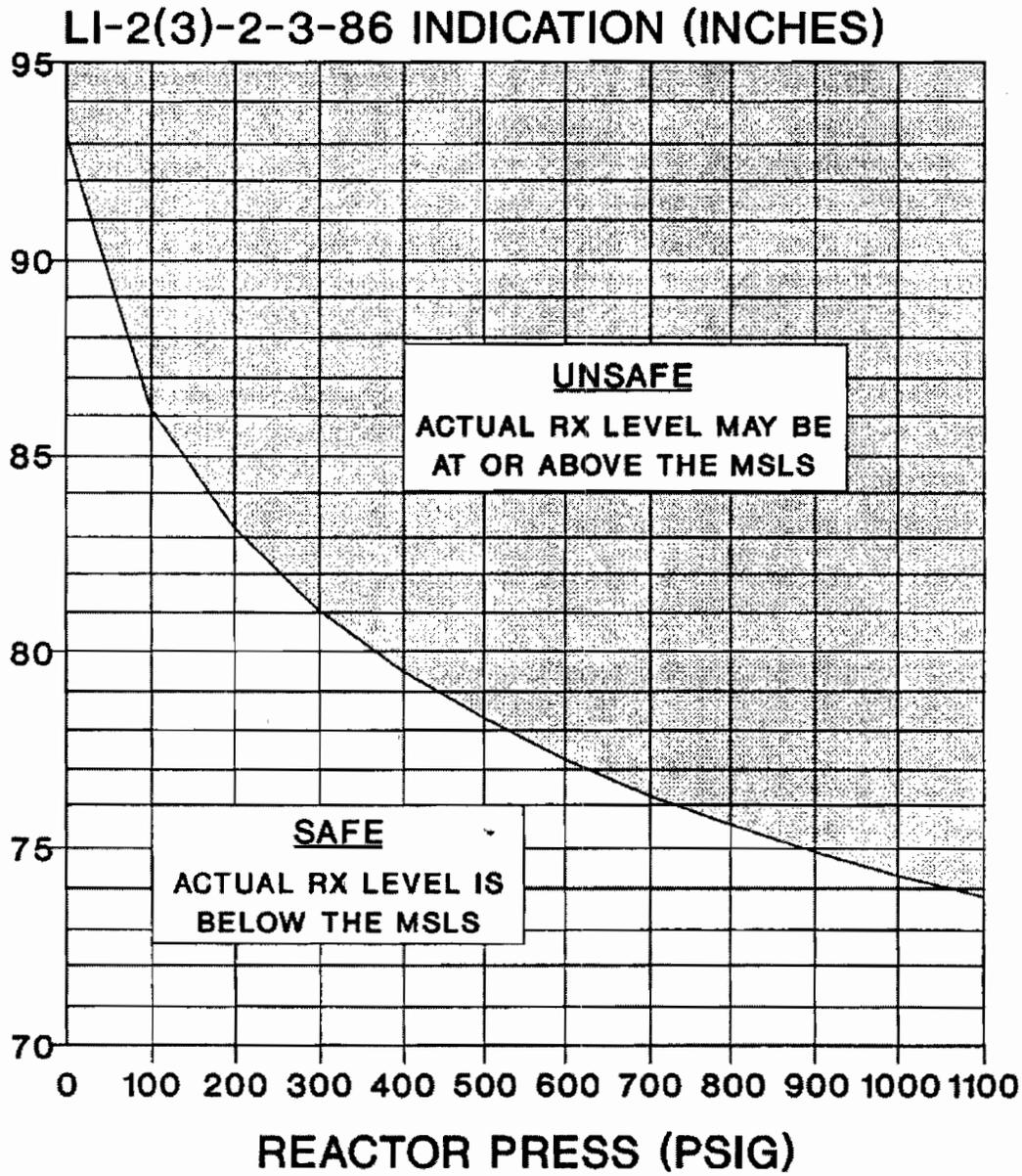
- All control rods are fully inserted
- RPV pressure is 1060 psig and rising slowly

Which one of the following actions is required for RPV pressure control?

Figure 1 of OT-110 "Reactor High Level" is PROVIDED ON THE NEXT PAGE.

- A. Restore and maintain reactor pressure below 1053 psig using the Bypass Jack per OT-102 "Reactor High Pressure".
- B. Restore and maintain reactor pressure below 1053 psig using EHC Pressure Set per OT-102 "Reactor High Pressure".
- C. Reduce reactor pressure below 1050 psig using a single SRV and prolonged SRV opening per OT-110 "Reactor High Level".
- D. Reduce reactor pressure below 1050 psig using multiple SRVs and short-duration SRV openings per OT-110 "Reactor High Level".

### FIGURE 1





85. Given the following:

- Unit 2 is in MODE 5
- In vessel fuel moves for Core Shuffle I are complete
- Control rod drive mechanism removal and replacement is in progress
- Refuel Floor exhaust ventilation radiation monitors RIS-17-458C and RIS-17-458D are determined to be inoperable

What Technical Specification action, if any, is required in order to continue the current activities?

Technical Specification 3.3.6.2 “Secondary Containment Isolation Instrumentation” is PROVIDED SEPARATELY.

- A. No actions are required; these monitors are NOT required for these conditions.
- B. Place both channels in trip within 12 hours or take the actions required by Condition C.
- C. Place both channels in trip within 24 hours or take the actions required by Condition C.
- D. Restore isolation capability within 1 hour or take the actions required by Condition C.



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

- BLOWDOWN VALVES POWER MONITOR (227 C-5) alarms
- The GREEN indicating light for the 'C' and 'D' SRVs are NOT lit
- The GREEN indicating lights for ALL other SRVs are lit
- Subsequent investigation identified blown fuses associated with the 'C' and 'D' SRV solenoids

What is (1) the impact on the ADS System, and (2) the Technical Specification action required for these conditions?

Technical Specifications 3.4.3 and 3.5.1 are PROVIDED SEPARATELY.

- A. (1) NO ADS valves are inoperable  
(2) Enter LCO 3.4.3 Condition A ONLY.
- B. (1) ONE ADS valve is inoperable  
(2) Enter LCO 3.5.1 Condition E ONLY.
- C. (1) TWO ADS valves are inoperable  
(2) Enter LCO 3.5.1 Condition H.
- D. (1) ONE ADS valve is inoperable  
(2) Enter LCO 3.4.3 Condition A and LCO 3.5.1 Condition E.



87. Given the following:

- Unit 2 is operating at 100% power
- APRM '1' is inoperable and bypassed
- APRM DOWNSCALE (211 C-2) is received
- The ODA for APRM '4' indicates downscale

Which one of the following describes (1) how these conditions impact the Reactor Protection System and (2) what action is required?

Technical Specification 3.3.1.1 "RPS Instrumentation" is PROVIDED SEPARATELY.

NOTE: GP-25 is titled "Installation of Trips/Isolations to Satisfy Tech Spec/TRM Requirements for Inoperable Instrumentation"

- A. (1) An RPS trip will occur  
(2) Enter and execute T-100 "Scram"
- B. (1) An RPS trip will occur  
(2) Perform AO 60F.2-2 "Defeat of an RPS Half Scram"
- C. (1) An RPS trip will NOT occur  
(2) Place ARPM '4' in the tripped condition using GP-25 Appendix 24 – "NUMAC APRM/OPRM Instrument Channels" within 6 hours
- D. (1) An RPS trip will NOT occur  
(2) Place ARPM '4' in the tripped condition using GP-25 Appendix 24 – "NUMAC APRM/OPRM Instrument Channels" within 12 hours

<b>Answer Key</b>		
<b>Question # 87 SRO</b>		
Choice	Basis or Justification	
Correct:	D	An RPS trip will not occur since (1) an APRM downscale condition does not cause an RPS trip (rod block only) and (2) the 2-out-of-4 logic (voter) modules must see two of the same trip input signals to cause an RPS trip. With APRM 1 bypassed, any trip signals generated by APRM 1 are removed. Tech Spec Table 3.3.1.1-1 requires 3 APRM channels per trip system in Mode 1. Since only 2 channels per trip system are available, Condition A applies, which requires placing the channel (APRM 4) in trip within 12 hours. This is done using GP-25, Appendix 24.
Distractors:	A	Part 1 is incorrect; part 2 is correct (if a scram were to occur). Plausible if applicant believes the given conditions are sufficient to cause a trip of the 2-out-of-4 logic (voter) modules, which if were true, would result in a reactor scram.
	B	Part 1 is incorrect; part 2 is incorrect. Plausible if applicant believes the given conditions are sufficient to cause a trip of the 2-out-of-4 logic (voter) modules and the trip resulted in a half scram vice a full scram, which is not the case.
	C	Part 1 is correct; part 2 is incorrect. Plausible if applicant believes Tech Spec 3.3.1.1 Condition B applies. This might occur if applicant incorrectly applies note 'c' on Table 3.3.1.1-1 (each APRM channel provides inputs to both trip systems) and misses the note for Condition B, which states the condition does not apply for Functions 2a, 2b, 2c, 2d or 2f.

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

<b>Source Documentation</b>		
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> ILT Exam Bank	<input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	ARC-211 C-2; Tech Spec 3.3.1.1; GP-25	
Learning Objective:	PLOT-5060C-8	
K/A System:	212000 – Reactor Protection System	Importance: SRO 3.7
K/A Statement: A2.04 – Ability to (a) predict the impact of the following on the Reactor Protection System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Nuclear instrument system failure.		
<b>REQUIRED MATERIALS:</b>	<b>Tech Spec 3.3.1.1 (Unit 2)</b>	
Notes and Comments:		

88. Units 2 and 3 are operating at 100% power with the following conditions present:

- The 'A' SBTG Filter Train is INOPERABLE due to water intrusion
- The 'B' SBTG Filter Train is unaffected and OPERABLE
- The damaged filter is expected to be returned to service within 96 hours
- A Prompt Investigation has been initiated

This issue will require \_\_\_\_\_.

- (1) Prompt notification to the NRC due to "Loss of System Safety Function"
- (2) Notification to the NRC as a "Condition Prohibited by Plant Technical Specifications"
- (3) Notifications per OP-AA-106-101 "Significant Event Reporting"

A portion of Technical Specification 3.6.4.3 "Standby Gas Treatment (SGT) System" is PROVIDED ON THE NEXT PAGE. OP-AA-106-101, Attachment 1 "Notification Requirements" is PROVIDED SEPARATELY.

- A. (1) and (3) ONLY
- B. (2) and (3) ONLY
- C. (3) ONLY
- D. No reports required

SGT System  
3.6.4.3

3.6 CONTAINMENT SYSTEMS

3.6.4.3 Standby Gas Treatment (SGT) System

LCO 3.6.4.3 Two SGT subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,  
During movement of RECENTLY IRRADIATED FUEL assemblies in  
the secondary containment,  
During operations with a potential for draining the reactor  
vessel (OPDRVs).

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SGT subsystem inoperable.	A.1 Restore SGT subsystem to OPERABLE status.	7 days



89. Given the following conditions:

- Unit 2 is operating at 100% power
- The 2A RBCCW pump is blocked for maintenance
- B REACT BLDG COOLING WATER PUMP OVLD (216 B-1) alarms
- The temperatures for components cooled by RBCCW are beginning to rise

Which one of the following describes the actions required by ON-113 “Loss of RBCCW” for the current plant conditions?

- A. Shutdown the running RWCU pumps and lower power per GP-9-2 “Fast Reactor Power Reduction” to reduce RBCCW System heat load.
- B. Perform GP-4 “Manual Reactor Scram” and trip both Recirc pumps to prevent exceeding Recirc pump motor bearing and/or seal cavity temperature limits.
- C. Trip one Recirc pump and execute OT-112 “Unexpected/Unexplained Change in Core Flow” concurrently to prevent exceeding Recirc pump motor bearing temperature limits.
- D. Reduce the speed of both Recirc pumps per GP-9-2, remove one Recirc pump from service and enter single loop operation per GP-5 “Power Operations” to reduce RBCCW System heat load.

<b>Answer Key</b>		
<b>Question # 89 SRO</b>		
Choice	Basis or Justification	
Correct:	A	Per ON-113 Step 2.2, if restoration of RBCCW is not imminent, RWCU pumps are shutdown and reactor power is lowered in accordance with GP-9-2. Per ON-113 Bases, the reason for these actions is to reduce the heat load on the RBCCW system and allow more time to diagnose and correct the cause of the RBCCW problem.
Distractors:	B	For the given conditions, this action is premature and does not follow the guidance given in ON-113. Direction to perform GP-4 is only given if it is necessary to trip both Recirc pumps, which is based on reaching certain motor bearing and/or seal cavity temperature limits.
	C	This action is not taken unless a Recirc pump motor bearing temperature exceeds 194 degrees F.
	D	This action is not taken unless a Recirc pump seal temperature exceeds 200 degrees F, and lowering pump speed does not reduce seal temperature to below 180 degrees F.

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

<b>Source Documentation</b>			
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> ILT Exam Bank		<input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	ON-113 and Bases		
Learning Objective:	PLOT-PBIG-1550-3, -18a, -18b		
K/A System:	400000 – Component Cooling Water	Importance:	SRO 3.0
K/A Statement: A2.03 – Ability to (a) predict the impacts of the following on the CCWS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High/low CCW temperature.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

90. The following conditions exist:

- Both units are operating at 100% power
- Offsite electrical sources are in a normal lineup
- 3SU Transformer Load Tap Changer (LTC) is in MANUAL
- The Main Supply Fan for the E-1 Diesel Generator is blocked

What action, if any, is required for these conditions?

Technical Specification 3.8.1 “AC Sources-Operating” is PROVIDED SEPARATELY.

- A. Enter Tech Spec 3.8.1 Condition A for both units.
- B. Enter Tech Spec 3.8.1 Condition B for both units.
- C. Enter Tech Spec 3.8.1 Condition E for both units.
- D. No Technical Specification action is required.

Answer Key		
Question # 90 SRO		
Choice	Basis or Justification	
Correct:	B	Based on the given conditions, the E-1 diesel is inoperable. Tech Spec 3.8.1 Bases requires the main supply fan to be operable in order to consider the diesel generator operable. Although the 3SU transformer is inoperable when its LTC is in manual, per Tech Spec Bases, this is not a required offsite source. Since there are two qualified offsite sources available, Tech Spec 3.8.1 Condition B (1 EDG inoperable) applies.
Distractors:	A	Based on the given conditions, two qualified offsite sources are available. Plausible if the applicant (1) does not recall the EDG main supply fan must be operable for its EDG to be operable, and (2) believes the 3SU source must be aligned with its LTC in automatic to meet Tech Spec 3.8.1 requirements.
	C	Based on the given conditions, two qualified offsite sources are available. Plausible if the applicant believes the 3SU source must be aligned with its LTC in automatic to meet Tech Spec 3.8.1 requirements.
	D	Based on the given conditions, the E-1 diesel is inoperable. Plausible if the applicant does not recall the EDG main supply fan must be operable for its EDG to be operable.

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

Source Documentation			
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> ILT Exam Bank	<input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Other Exam Bank: ()	
Reference(s):	Tech Spec 3.8.1 and Bases; E-1		
Learning Objective:	PLOT-5051-8, -9; PLOT-5052-8, -9		
K/A System:	262001 – A.C. Electrical Distribution	Importance:	SRO 4.7
K/A Statement: G2.2.22 – Knowledge of limiting conditions for operations and safety limits.			
<b>REQUIRED MATERIALS:</b>	<b>Tech Spec 3.8.1 for BOTH Units</b>		
Notes and Comments:			

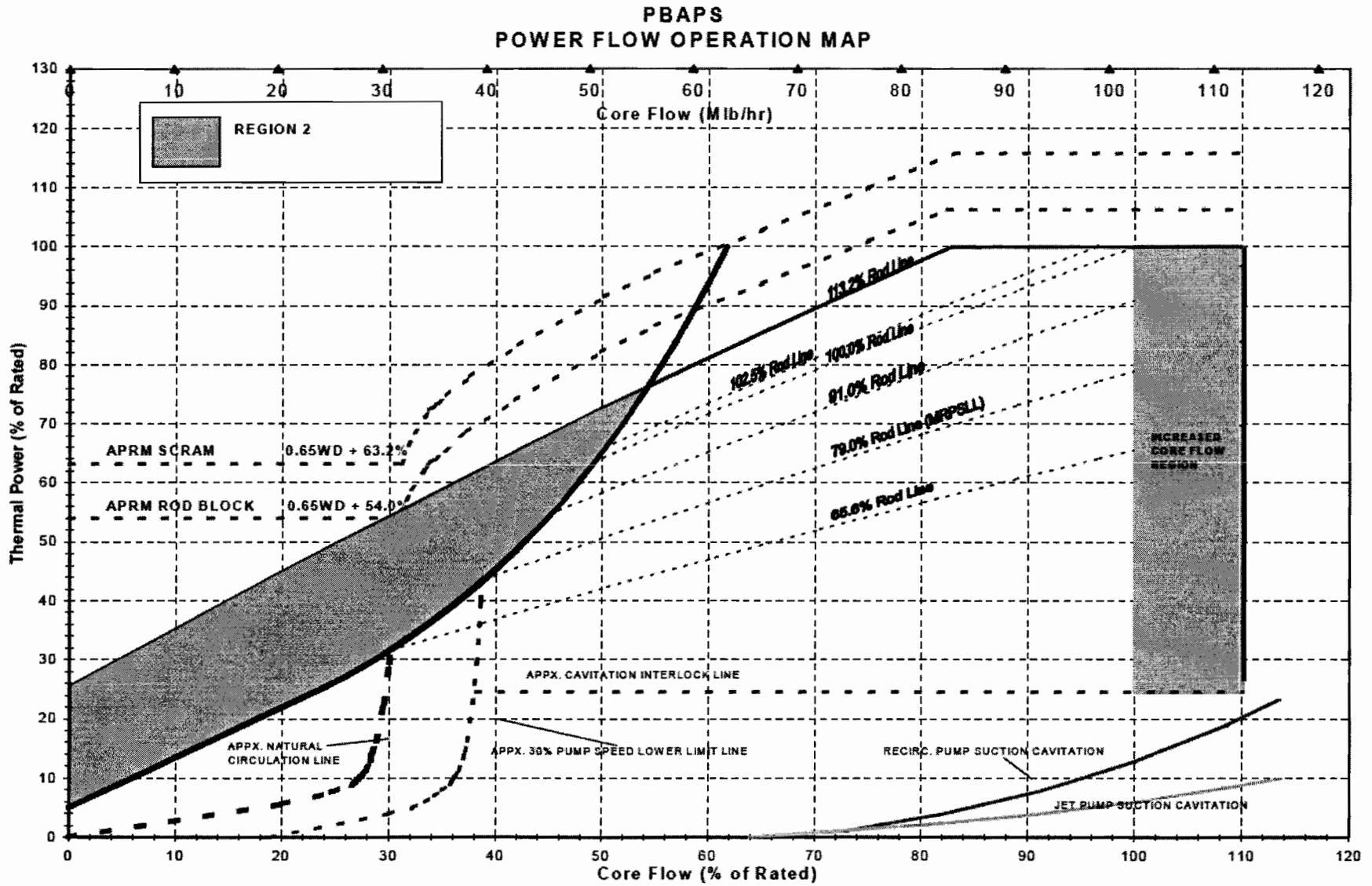
91. Unit 2 was initially at 100 % power when the following transient occurred:

- Feedwater Heater String A3/4/5 isolated
- Reactor power rose to 106%
- Core flow is 91%
- Thermal Limit/FLLLP values are as follows:
  - MFLCPR – 0.979
  - MFLPD – 0.955
  - MAPRAT – 0.945
  - FLLLP – 1.009

Which one of the following describes (1) the impact of these conditions and (2) the required action to be taken?

GP-5-1 “PBAPS Power Flow Operation Map” is PROVIDED ON THE NEXT PAGE.

- A. (1) Core operation is outside the analyzed region of the Power to Flow Map.  
(2) Reduce reactor power IAW GP-9-2 “Fast Power Reduction” to less than 90% per OT-104 “Positive Reactivity Insertion”.
- B. (1) Core operation is outside the analyzed region of the Power to Flow Map.  
(2) Reduce reactor power by insertion of GP-9-2 Appendix 1 rods to less than 90% per OT-104 “Positive Reactivity Insertion”.
- C. (1) A Thermal Limit / FLLLP violation has occurred.  
(2) Reduce reactor power using Recirc flow IAW GP-5 “Power Operations” until FLLLP is less than 1.000 per GP-13 “Resolution of Thermal Limit Violations”.
- D. (1) A Thermal Limit / FLLLP violation has occurred.  
(2) Reduce reactor power IAW GP-3 “Normal Plant Shutdown” such that thermal power is less than 25% RTP within 4 hours.



FR-2(3)-02-3-095 (Black pen) OR B015(B315)

CM-1

<b>Answer Key</b>		
<b>Question # 91 SRO</b>		
Choice	Basis or Justification	
Correct:	A	Per the given conditions, the core is operating outside of the analyzed region of the Power to Flow Map. OT-104, step 3.5.1 direction for these conditions is to lower reactor power IAW GP-9-2 as necessary to maintain APRM power within the analyzed region of the Power-to-Flow Map <u>and</u> at least 10% below the pre-transient power level. For the given conditions, this will require reducing Recirc flow to < 90% power.
Distractors:	B	Part 1 is correct; Part 2 is incorrect. OT-104 directs reducing power IAW GP-9-2, which will involve an initial flow reduction. Plausible if applicant believes insertion of control rods to restore acceptable point on the Power-Flow map is required, as is the case if operating in Region 2.
	C	Part 1 is correct; Part 2 is incorrect. A FLLLP violation has occurred, however OT-104 specifically directs GP-13 entries to be evaluated AFTER power reduction is performed per step 3.5.1. In addition, GP-13 requires power reduction using <u>control rods only</u> until FLLLP is less than 1.000.
	D	Part 1 is correct; Part 2 is incorrect. A FLLLP violation has occurred, however the action in Part 2 is required by GP-13 ONLY IF unable to restore thermal limits or FLLLP to less than 1.000 within 2 hours.

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

<b>Source Documentation</b>		
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> Other Exam Bank: () <input type="checkbox"/> ILT Exam Bank	
Reference(s):	OT-104 and Bases; GP-9-2; GP-13	
Learning Objective:	PLOT-PBIG-1540-4	
K/A System:	256000 – Reactor Condensate System	Importance: SRO 2.9
K/A Statement: A2.17 – Ability to (a) predict the impacts of the following on the Reactor Condensate System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Feedwater heater string trip.		
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>	
Notes and Comments:		

92. A Unit 2 startup is in progress with the following plant conditions:

- Reactor power is 25%
- Generator output is 200 MWe
- Annunciator TURBINE STOP V. CLOSURE & CONTROL VLV FAST CLOSURE SCRAM BYPASS (210 A-2) is lit
- A relay failure causes the Power-to-Load Unbalance circuit to actuate
- The POWER LOAD UNBALANCE TRIP (206 B-1) annunciator alarms

Which one of the following describes (1) the automatic plant response and (2) the correct procedural direction for this event?

- A. (1) Turbine trip ONLY  
(2) Perform applicable sections of SO 1B.2.A-2 "Main Turbine Generator Shutdown"
- B. (1) Generator lockout and turbine trip ONLY  
(2) Halt GP-2 "Startup"
- C. (1) Generator lockout, turbine trip and reactor scram  
(2) Enter T-100 "Scram"
- D. (1) The turbine and generator remain online; the reactor does NOT scram  
(2) Perform applicable sections of SO 1B.2.A-2 "Main Turbine Generator Shutdown"



93. The following conditions exist on Unit 2:

- Reactor is shutdown
- Reactor level is -200 inches
- Reactor pressure is 100 psig
- RHR Loop 'A' is unavailable
- RHR Loop 'B' is injecting at 18,000 GPM
- Core Spray Loops 'A' and 'B' have failed to inject
- Drywell temperature is 300 degrees F
- Drywell pressure is 8 psig
- Torus pressure is 6 psig
- Torus level is 17 feet and steady
- Containment H<sub>2</sub> and O<sub>2</sub> concentrations require performing step DW/G-3 of T-102 "Primary Containment Control"

Containment Spray must \_\_\_\_ (1) \_\_\_\_ based on \_\_\_\_ (2) \_\_\_\_.

Portions of T-102 are PROVIDED ON THE NEXT TWO PAGES.

- A. (1) NOT be initiated  
(2) lack of adequate core cooling
- B. (1) NOT be initiated  
(2) Drywell Spray Initiation Limit curve
- C. (1) be initiated  
(2) drywell temperature exceeding design limit
- D. (1) be initiated  
(2) potential for loss of Primary Containment integrity

L DW/T-12

**IF** TORUS LEVEL IS BELOW 18 FT  
**AND**  
DW BULK AVG TEMP AND DW PRESS  
ARE BELOW CURVE DW/T-2,

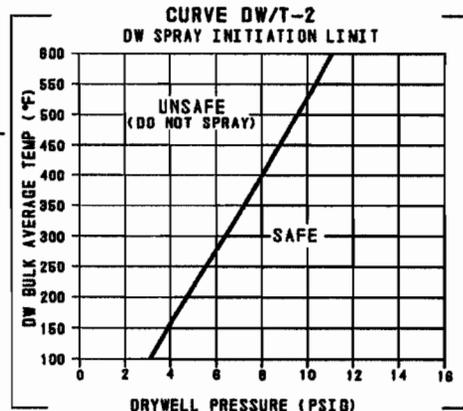
**THEN** BEFORE DW BULK AVG TEMP  
REACHES 281° F:

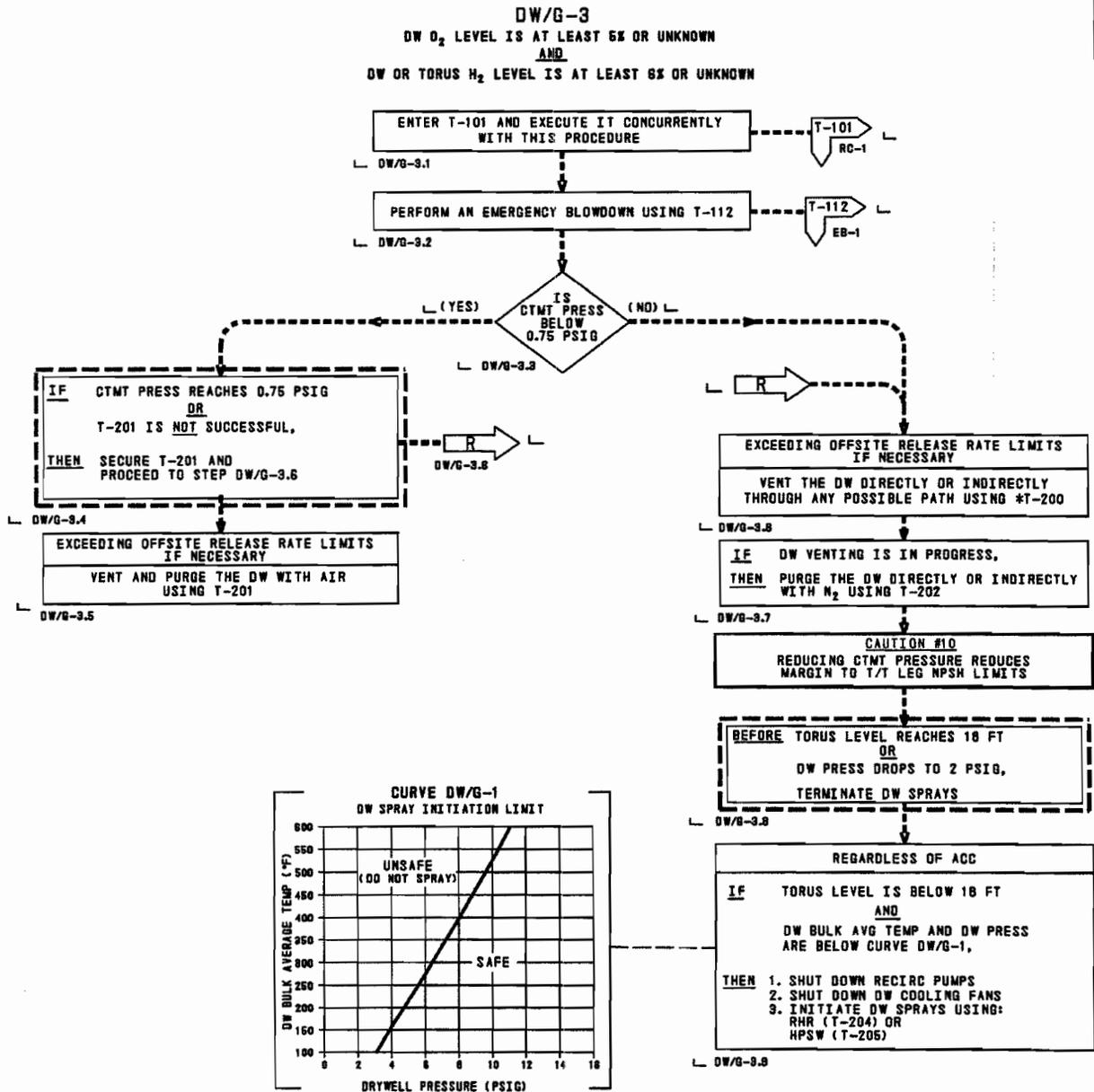
1. SHUT DOWN RECIRC PUMPS
2. SHUT DOWN DW COOLING FANS
3. INITIATE DW SPRAYS USING:  
RHR (T-204) OR  
HPSW (T-205)

USE ONLY THOSE PUMPS NOT  
CONTINUOUSLY REQUIRED TO ASSURE ACC

#27

L DW/T-13





<b>Answer Key</b>		
<b>Question # 93 SRO</b>		
Choice	Basis or Justification	
Correct:	D	Based on the given conditions, and the guidance of T-102 Step DW/G-3.9, containment sprays are required regardless of ACC. Per T-102 Step DW/G-3.9 Bases, spraying the drywell is performed regardless of ACC because of the potential for deflagration, which could result in a loss of primary containment integrity leading, in turn, to a loss of core cooling capability.
Distractors:	A	Although T-102 Step DW/T-13 directs spraying only with those pumps not continuously required to assure ACC, and using the only available loop of RHR would jeopardize ACC, T-102 Step DW/G-3.9 directs spraying regardless of ACC.
	B	Drywell Spray Initiation Limit (DWSIL) curve is NOT exceeded. Plausible if applicant uses torus pressure to plot the DWSIL curve.
	C	Although drywell temperature has exceeded the design limit of 281 degrees F, this is not the reason containment spray is required since this guidance comes from the DW/T leg of T-102; the reason containment spray is required is based on the guidance in the DW/G leg of T-102.

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

<b>Source Documentation</b>			
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> ILT Exam Bank		<input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	T-102		
Learning Objective:	PLOT-PBIG-2102-5a, -6		
K/A System:	226001 – RHR/LPCI: Containment Spray System Mode	Importance:	SRO 4.6
K/A Statement: G2.1.20 – Ability to interpret and execute procedure steps.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

94. Unit 2 is in day 2 of a refueling outage with the following conditions present:

- The Reactor is in Mode 4
- RHR Loop 'B' is in Shutdown Cooling
- C RHR PUMP ROOM FLOOD (224 C-5) is in alarm
- TORUS WATER LEVEL OUT OF NORMAL RANGE (226 A-4) is in alarm
- 'C' RHR Pump Room water level is reported to be 18 inches
- Torus level is 14.5 feet and lowering

What is the highest EAL classification, if any, for these conditions?

T-103 "Water Level-Alarm and Action Levels" table is PROVIDED ON THE NEXT PAGE. EP-AA-1007 Table PBAPS 3-1 "EAL Matrix" is PROVIDED SEPARATELY.

- A. Unusual Event per FU1
- B. Unusual Event per HU5
- C. Alert per HA5
- D. No EAL classification

**TABLE SC/L-2**  
**WATER LEVEL-ALARM AND ACTION LEVELS**

AREA	ALARM LEVEL	ACTION LEVEL		INDICATION	STATUS
		UNIT 2	UNIT 3		
TORUS ROOM	6 IN.	100 IN.	100 IN.	LI-2(3)919	
SUMP ROOM OR RCIC ROOM OR HPCI ROOM	NONE 6 IN. 6 IN.	1 FT 7 IN. 2 FT 5 IN. 2 FT 2 IN.	1 FT 4 IN. 2 FT 5 IN. 2 FT 2 IN.	LOCAL SIGN LOCAL SIGN LOCAL SIGN	
A RHR ROOM OR C RHR ROOM	6 IN. 6 IN.	2 FT 11 IN. 1 FT 3 IN.	3 FT 5 IN. 3 FT 5 IN.	LOCAL SIGN LOCAL SIGN	
B RHR ROOM OR D RHR ROOM	6 IN. 6 IN.	1 FT 5 IN. 3 FT 4 IN.	3 FT 5 IN. 3 FT 5 IN.	LOCAL SIGN LOCAL SIGN	
A CS ROOM OR C CS ROOM	6 IN. 6 IN.	1 FT 10 IN. 3 FT 6 IN.	3 FT 3 IN. 3 FT 1 IN.	LOCAL SIGN LOCAL SIGN	
B CS ROOM OR D CS ROOM	6 IN. 6 IN.	2 FT 5 IN. 2 FT 3 IN.	2 FT 4 IN. 2 FT 10 IN.	LOCAL SIGN LOCAL SIGN	



95. Both units are operating at 100% power.

A breach is being planned for the Cable Spreading Room Return Ducting that passes through the Control Room Envelope (CRE).

The breach size has been calculated to:

- be equivalent to 144 in<sup>2</sup> in the 12 inch thick wall
- result in an additional 400 cfm of leakage burden

This breach will result in \_\_ (1) \_\_ MCREV train becoming INOPERABLE, due to excessive \_\_\_\_ (2) \_\_\_\_.

These items are PROVIDED ON THE FOLLOWING PAGES:

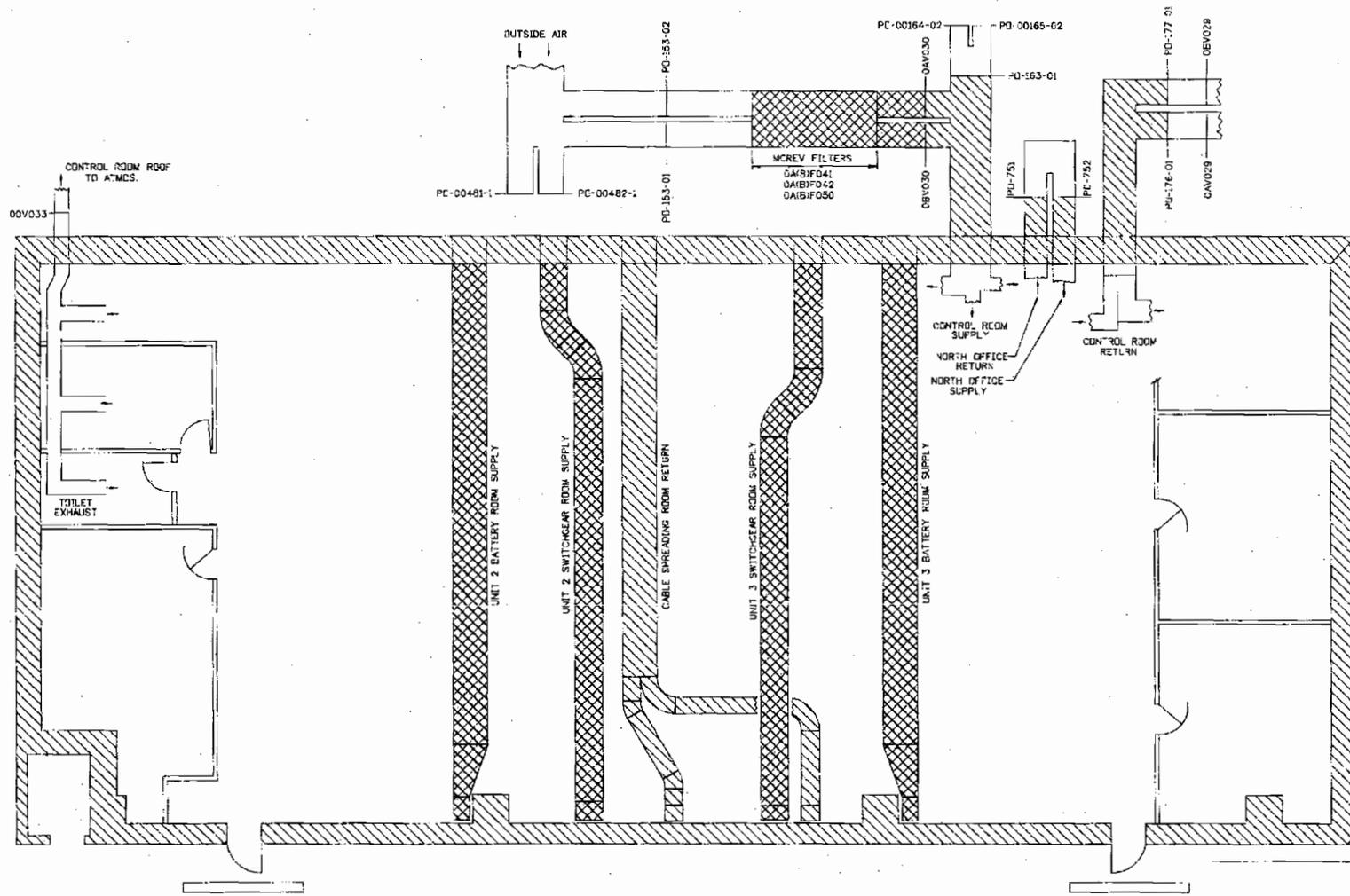
1. CRE section of A-487
2. Current CRE Temporary Breach Log
3. CRE Boundary Operability discussion from GP-30

A. (1) A  
(2) out-leakage

B. (1) A  
(2) in-leakage

C. (1) B  
(2) out-leakage

D. (1) B  
(2) in-leakage



**CONTROL ROOM ENVELOPE PLAN**

CONTROL ROOM ENVELOPE INCLUDES - WALLS,  
FLOOR & CEILING OF CONTROL ROOM

LEGEND:

- OUT-LEAKAGE BARRIER
- UNFILTERED IN-LEAKAGE BARRIER

PORTIONS OF THIS DRAWING  
MAY NOT BE LEGIBLE AT  
A REDUCED SIZE

From A-487

ATTACHMENT A

"A" MCREV TRAIN CONTROL ROOM ENVELOPE TEMPORARY BREACH LOG

Breach Number	(1) Breach Added DATE/TIME	(2) Breach Restored DATE/TIME	(3) CALCULATED INLEAKAGE (CFM)	(4) TOTAL INLEAKAGE (CFM)	TOTAL INLEAKAGE < 500 CFM Y or N?	(5) CALCULATED BREACH AREA (FT <sup>2</sup> )	(6) TOTAL BREACH AREA (FT <sup>2</sup> )	TOTAL BREACH AREA < 4.128 FT <sup>2</sup> Y or N?
				<b>450</b>			<b>2.122</b>	

ATTACHMENT B

"B" MCREV TRAIN CONTROL ROOM ENVELOPE TEMPORARY BREACH LOG

Breach Number	(1) Breach Added DATE/TIME	(2) Breach Restored DATE/TIME	(3) CALCULATED INLEAKAGE (CFM)	(4) TOTAL INLEAKAGE (CFM)	TOTAL INLEAKAGE < 500 CFM Y or N?	(5) CALCULATED BREACH AREA (FT <sup>2</sup> )	(6) TOTAL BREACH AREA (FT <sup>2</sup> )	TOTAL BREACH AREA < 4.128 FT <sup>2</sup> Y or N?
				<b>50</b>			<b>3.556</b>	

From GP-30 CONTROL ROOM ENVELOPE BOUNDARY INTEGRITY

"The CRE boundary may become inoperable due to inleakage and/or outleakage that lowers the ability of the MCREV system to protect MCR personnel from radioactive material during an accident. Depending on the location of the leakage, one or both trains of MCREV may be affected. Generally, the CRE boundary can become inoperable due to any of the following:

- o Unfiltered inleakage above 500 cfm for either the "A" OR "B" train of MCREV. Work activities will be assigned a value for Calculated Inleakage . . . as shown on A-487, "Barrier Plans Elev 165-0". Work activities not affecting this equipment may have an assigned value of 0 (zero) for Calculated Inleakage.
- o Inability to maintain positive pressure within the CRE boundary due to a breach (i.e., a breach in the physical CRE boundary other than in the equipment described for unfiltered inleakage). . . The maximum breach area that will maintain positive pressure in 12" thick portions of the CRE boundary is calculated to be 4.128 ft<sup>2</sup>. Breaches in the CRE boundary will be assigned a value for Calculated Breach Area. Work activities not affecting this equipment may have an assigned value of 0 (zero) for Calculated Breach Area."

Answer Key		
Question # 95 SRO		
Choice	Basis or Justification	
Correct:	C	As indicated on A487, the Cable Spread Room Return ducting forms part of the OUT-LEAKAGE Barrier – the integrity of the OUT-LEAKAGE Barrier is required to ensure the ability to maintain a positive pressure in the MCR. Provided this barrier breach area is less than 4.128 sq ft, operability is maintained. If greater than this area, operability is NOT maintained, as discussed in the portion of GP-30 provided. The candidate must correctly identify the barrier on the A-487 print and then translate this correctly to the GP-30 table, and arrive at the conclusion that the “B” train OUT-LEAKAGE Barrier will be compromised.
Distracters:	A	Candidate may select this option if they do not correctly identify the boundary type or misapply the leakage type.
	B	Candidate may select this option if they do not correctly identify the boundary type or misapply the leakage type.
	D	Candidate may select this option if they do not correctly identify the boundary type or misapply the leakage type.

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

Source Documentation			
Source:	<input checked="" type="checkbox"/> New Exam Item <input type="checkbox"/> Modified Bank Item <input type="checkbox"/> ILT Exam Bank		<input type="checkbox"/> Previous NRC Exam: () <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	GP-30; A-487		
Learning Objective:	PLOT-DBIG-1530-1, -2, 3		
K/A System:	G 2.2 – Equipment Control	Importance:	SRO 4.3
K/A Statement: G2.2.15 – Ability to determine the expected plant configuration using design and configuration control documentation, such as drawings, line-ups, tag-outs, etc.			
<b>REQUIRED MATERIALS:</b>		<b>NONE</b>	
Notes and Comments:			

96. While operating at power, OT-101 is entered due to rising drywell pressure with the following conditions:

- Drywell pressure is 0.7 psig and rising slowly
- Drywell temperature is 137 degrees F and rising slowly
- The drywell is being vented using SO 7B.3.A-2 “Containment Atmosphere Pressure Control and Nitrogen Makeup”
- Drywell radiation suddenly spikes to  $2.5 \times 10^{-1} \mu\text{Ci/cc}$  and continues to rise

Based on the above conditions, what action must be taken and why?

- A. Re-align the vent path to the Torus to “scrub” the release.
- B. Terminate venting to ensure ODCM release limits are not exceeded.
- C. Perform a GP-15 “Local Evacuation” of the Radwaste Building.
- D. Direct Rad Protection to perform dose calculations from Main Stack data.

<b>Answer Key</b>		
<b>Question # 96 SRO</b>		
Choice	Basis or Justification	
Correct:	B	Per OT-101 Bases, venting is required to be terminated to ensure the ODCM release limits are not exceeded.
Distractors:	A	This is not in accordance with the direction in OT-101, but may be confused with the guidance for venting in T-200.
	C	Evacuation of the Radwaste Building is not required for this venting operation. This would only be true for T-200 venting.
	D	Offsite dose calculations are not required since terminating the venting operation ensures ODCM (and Tech Spec) limits are not exceeded.

<b>Psychometrics</b>			
Level of Knowledge	Difficulty	Time Allowance (minutes)	SRO
MEMORY	3.5	3	10CFR55.43(b)(4)

<b>Source Documentation</b>		
Source:	<input type="checkbox"/> New Exam Item <input checked="" type="checkbox"/> Modified Bank Item <input checked="" type="checkbox"/> ILT Exam Bank	<input checked="" type="checkbox"/> Previous NRC Exam: (PB 2002) <input type="checkbox"/> Other Exam Bank: ()
Reference(s):	OT-101; SO 7B.3.A-2	
Learning Objective:	PLOT-1540-04	
K/A System:	G2.3 – Radiation Control	Importance: SRO 3.8
K/A Statement:	G2.3.14 – Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.	
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>	
Notes and Comments:		

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

- Reactor power is 40% 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+04  $\mu\text{Ci/sec}$  and rising
- MAIN STACK RADIATION HIGH-HIGH (003 D-1) is in alarm
- Main Stack radiation on RI-050A(B) is 4.17 E+07  $\mu\text{Ci/sec}$  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.

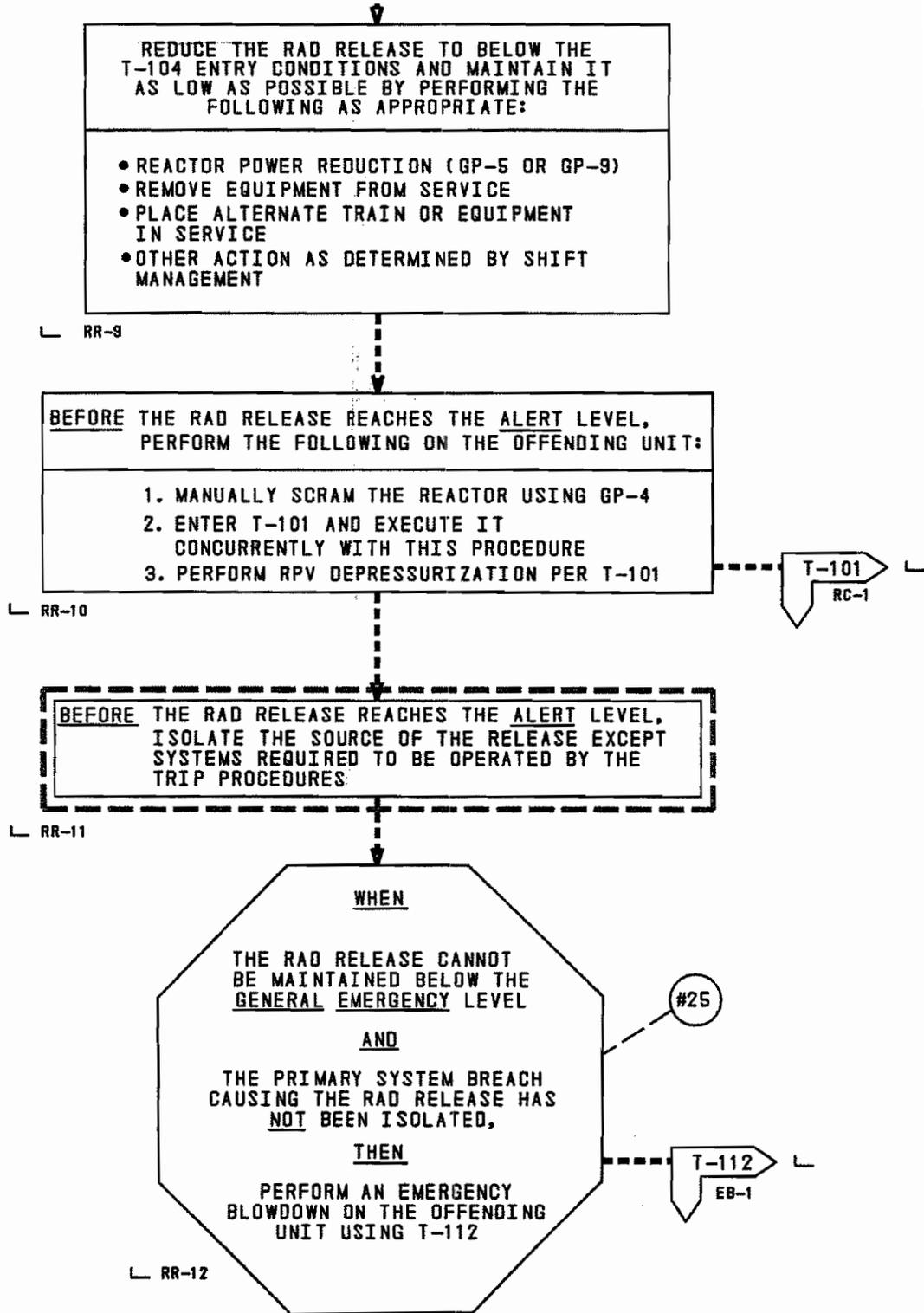
\_\_\_\_(1)\_\_\_\_ based on \_\_\_\_ (2)\_\_\_\_.

- 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**

<b>Table R1 -- Effluent Monitor Thresholds</b>				
<b>Release Path</b>	<b>General Emergency</b>	<b>Site Area Emergency</b>	<b>Alert</b>	<b>Unusual Event</b>
<b>Main Stack</b> (RI-0-17-050A/B Common)	5.57 E+09 $\mu\text{Ci/sec}$	5.57 E+08 $\mu\text{Ci/sec}$	6.36 E+07 $\mu\text{Ci/sec}$	6.36 E+05 $\mu\text{Ci/sec}$
<b>Vent Stack</b> (RI-2979A/B Unit 2 or RI-3979A/B Unit 3)	3.36 E+08 $\mu\text{Ci/sec}$	3.36 E+07 $\mu\text{Ci/sec}$	3.83 E+06 $\mu\text{Ci/sec}$	3.83 E+04 $\mu\text{Ci/sec}$

### T-104 "Radioactivity Release"





98. Equipment Operators need to enter a locked high radiation area to manually operate Primary Containment Isolation Valves in order to satisfy a Technical Specification required action. The highest dose rate in the area is 16,000 mR/hr (16 R/hr).

Per RP-PB-460-1001 "Radiation Protection Controlled Keys", which one of the following describes the type of Locked High Radiation Area and the highest level of authorization required for issuing the key?

	<u>Type of LHRA</u>	<u>Highest Authorization Required</u>
A.	Level 1	Radiation Protection Manager
B.	Level 1	Plant Manager
C.	Level 2	Radiation Protection Manager
D.	Level 2	Plant Manager

<b>Answer Key</b>		
<b>Question # 98 SRO</b>		
Choice	Basis or Justification	
Correct:	C	Per RP-PB-460-1001, Level 2 LHRA is an area with dose rates > 15R/hr. The RP Manager must provide authorization for this entry.
Distracters:	A	The level is incorrect. The area is a Level 2 (>15R/hr), which requires authorization from the RP Manager for issuing the key.
	B	The level is incorrect, and the Plant Manager's authorization is NOT required. Plausible since the Plant Manager can authorize a key for access to a Very High Radiation Area (VHRA).
	D	While the level is correct, the RP Manager must provide authorization for this entry. Plausible since the Plant Manager can authorize a key for access to a Very High Radiation Area (VHRA).

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

<b>Source Documentation</b>			
Source:	<input type="checkbox"/> New Exam Item <input type="checkbox"/> Modified Bank Item <input checked="" type="checkbox"/> ILT Exam Bank	<input checked="" type="checkbox"/> Previous NRC Exam: (PB 2008) <input type="checkbox"/> Other Exam Bank	
Reference(s):	RP-AA-460; RP-PB-460-1001		
Learning Objective:	PLOT-1770-3		
K/A System:	G2.3 – Radiation Control	Importance:	SRO 3.8
K/A Statement: G2.3.13 – Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.			
<b>REQUIRED MATERIALS:</b>	<b>NONE</b>		
Notes and Comments:			

99. A small steam leak inside the Drywell occurred on Unit 2.

The reactor was depressurized in accordance with T-112 "Emergency Blowdown" due to being unable to restore and maintain drywell temperature below 281 degrees F.

The following conditions existed at the start of the blowdown:

- Indicated RPV level was -140 inches
- All high-pressure feed sources were unavailable

The following conditions exist at the completion of the blowdown:

- RPV pressure is 35 psig
- RPV level is -175 inches
- Drywell temperature is 295 degrees F (TI-2501 points 126 and 127)
- Multiple failures prevented LPCI and Core Spray systems from injecting

What action is required for these conditions?

Portions of T-102 "Primary Containment Control" AND T-112 "Emergency Blowdown" are PROVIDED ON THE NEXT TWO PAGES.

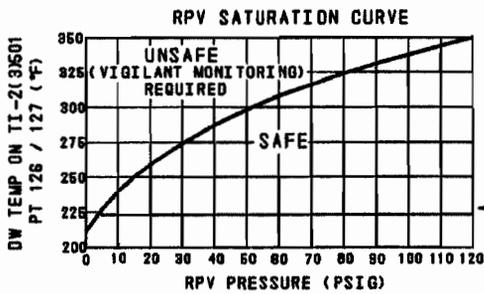
- A. Enter and execute T-116 "RPV Flooding".
- B. Establish Shutdown Cooling per T-112 "Emergency Blowdown".
- C. Restore RPV level above -172 inches per T-111 "Level Restoration".
- D. Restore RPV level to between +5 and +35 inches per T-101 "RPV Control".

### T-102 "Primary Containment Control"

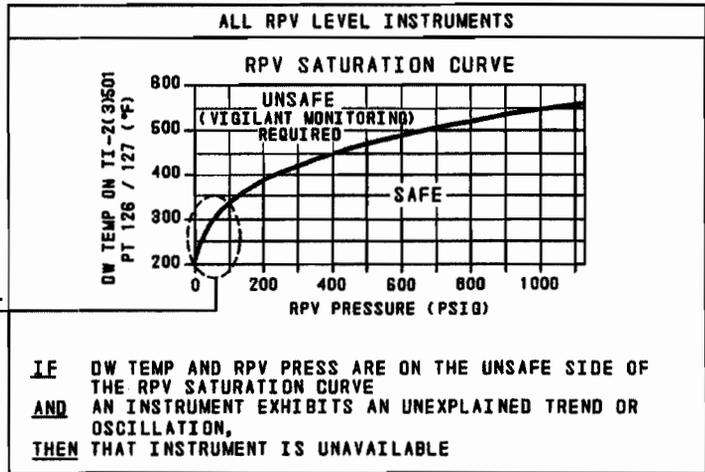
**TABLE DW/T-1**  
RPV LEVEL INSTRUMENT STATUS

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

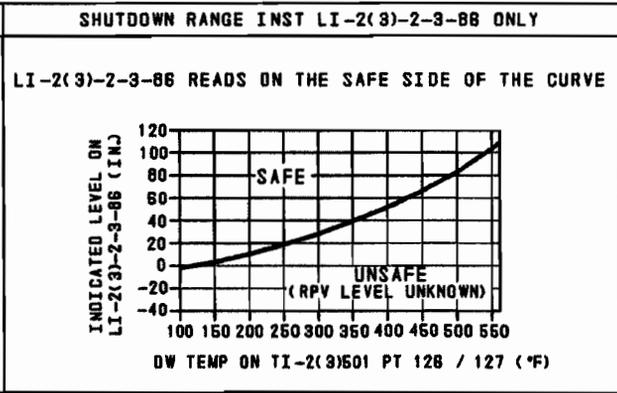
NOTE: USE AVAILABLE POINTS (126 / 127 OF TI-2(3)501) TO DETERMINE RPV LEVEL INSTRUMENT STATUS



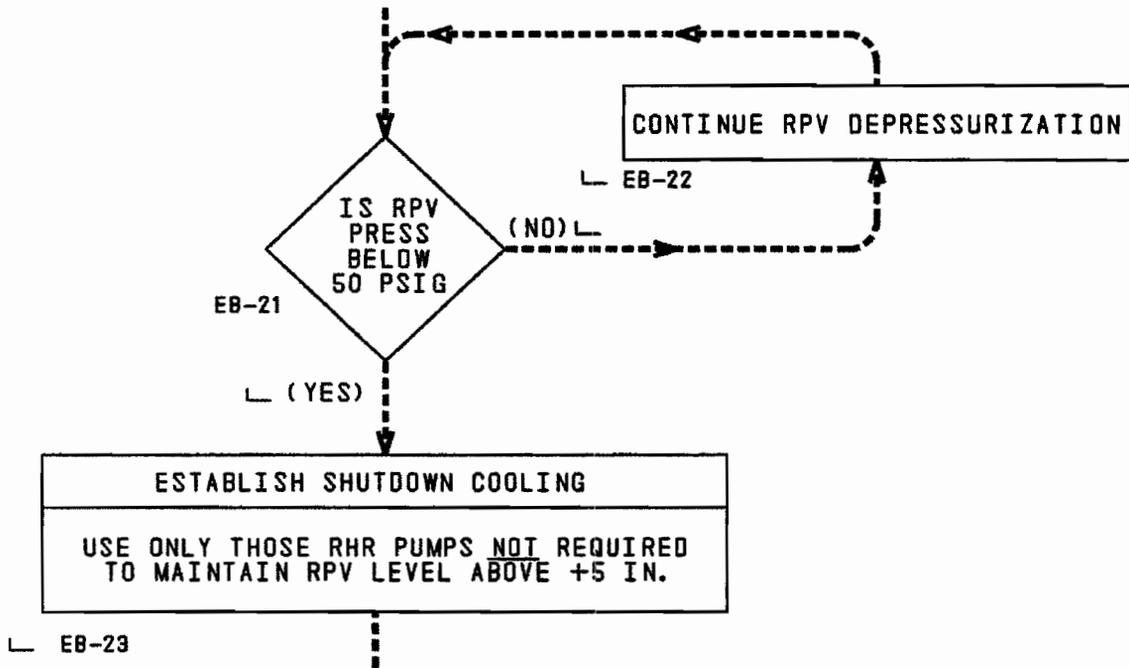
SEE DETAIL



WIDE AND NARROW RANGE INSTRS 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	QR	MAX RUN TEMP IS BELOW
NARROW RANGE	10 IN.	QR	450°F
WIDE RANGE	-120 IN.	QR	500°F



### T-112 "Emergency Blowdown"



Answer Key		
Question # 99 SRO		
Choice		Basis or Justification
Correct:	C	With RPV level at -175 inches, the only on-scale level indicators are Fuel Zone. Per T-102, Table DW/T-1, fuel zone level plots on the UNSAFE side of the RPV saturation curve. But since there are no unexplained trends or oscillations, level is NOT unknown. Level restoration per T-111 is required.
Distracters:	A	Level is not unknown. Plausible if applicant incorrectly applies Table DW/T-1 and/or believes the given conditions show an "unexplained trend".
	B	Level is known to be below the point at which T-111 "Level Restoration" actions are required. In addition, SDC cannot be established until RPV level is restored. Plausible based on the T-112 excerpt provided with question.
	D	Level is known to be below the point at which T-111 "Level Restoration" actions are required. Plausible if applicant does not recall the level control strategies of T-101 versus T-111; if level cannot be maintained above -172 inches (as is the case here), T-101 must be exited and entry into T-111 is required. Once level is restored above -172 inches, T-101 is reentered from T-111.

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

Source Documentation			
Source:	<input type="checkbox"/> New Exam Item <input checked="" type="checkbox"/> Modified Bank Item <input checked="" type="checkbox"/> ILT Exam Bank		<input checked="" type="checkbox"/> Previous NRC Exam: (PB 2008) <input type="checkbox"/> Other Exam Bank
Reference(s):	T-101; T-102; T-112; T-116		
Learning Objective:	PLOT-1560-11		
K/A System:	G2.1 – Conduct of Operations	Importance:	SRO 4.3
K/A Statement: G2.1.45 – Ability to identify and interpret diverse indications to validate the response of another indicator.			
<b>REQUIRED MATERIALS:</b>		<b>NONE</b>	
Notes and Comments:			

100. 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 Technical Specification 3.3.2.1 “Control Rod Block Instrumentation” are met

With the RWM inoperable, Technical Specification 3.3.2.1 requires verification that movement of control rods is in compliance with the analyzed rod position sequence.

The second verification must be performed by \_\_\_\_\_.

- A. the Reactor Engineer
- B. a licensed RO or SRO
- C. an STA qualified individual
- D. a Shift Manager qualified individual

