Question 1 **1 Point**

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

- CIP-3 PWR LOST

Which of the following states the impact on the plant?

A. ½ scram **AND** partial Primary Containment isolation

B. Turbine Ventilation isolation **AND** partial RPV isolation

C. ½ scram **AND** Standby Gas Treatment System initiation

D. Standby Gas Treatment System initiation **AND** partial Primary Containment isolation

Question # Answer	1 D	Question Developer Initials/Date: NTP 1/21/09

Knowledge and Ability Reference Information						RO	SRO
262002 UPS (AC/DC) K1.08 - Knowledge of the physical connections and/or cause- effect relationships between UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) and the following: Containment isolation system: Plant-Specific					Importance Rating	2.9	3.1
Level	**RO**	**Tier #**	**2**	**Group #**	**1**		
References		ABN-58					
Explanation:	The Annunciator describes a loss of instrument panel CIP-3. When this bus is lost, SGT System initiates, and a partial Primary Containment isolation occurs. Answer D is correct. The loss of this bus will not result in a ½ scram, but loss of other UPS busses can result in a full scram. No RPV isolations occur from the loss of this bus and the loss of the TB Ventilation System will occur from a loss of VACP-1.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0056 LO 262-10445 Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.						

Question Source	Bank		Modified Bank		New	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:I	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**		**55.43**			
Time to Complete: 1-2 minutes						

Question 2 **1 Point**

The plant was at 3% power during a startup with the REACTOR MODE SELECTOR switch in STARTUP. An electrical spike caused the following to occur **SIMULTANEOUSLY**:

- A momentary upscale on ARPM 3 (for about 3 seconds)
- A momentary upscale spike in IRM 15 (for about 3 seconds)

Which of the following states the impact on RPS Group Solenoids from this event?

	RPS 1	RPS 2
A.	Energized	Energized
B.	De-energized	Energized
C.	Energized	De-energized
D.	De-energized	De-energized

Question # Answer	2 D	Question Developer Initials/Date: NTP 1/21/09

						RO	SRO
212000 RPS K1.01 - Knowledge of the physical connections and/or cause- effect relationships between REACTOR PROTECTION SYSTEM and the following: Nuclear instrumentation					**Importance Rating**	3.7	3.9
Level	RO	**Tier #**	2	**Group #**	1		
References		TS Table 3.1.1		237E566			
Explanation:	The plant is starting up with the mode switch in STARTUP. In this mode, an IRM 15 upscale would de-energize the RPS 2 group solenoids (this would have been bypassed with the mode switch on RUN). The APRM 3 upscale would de-energize the RPS 1 group solenoids, in both RUN and STARTUP position of the mode switch. Therefore, both RPS 1 and RPS 2 group solenoids will be de-energized. Answer D is correct. The other answers are incorrect and plausible if the candidate confuses which RPS side the IRM and APRM are located or what the normal state of the group solenoids is (energized).						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0029 LO 215-10445 Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.						

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 2:DR
10 CFR Part 55 Content:	**55.41**	6	**55.43**			
Time to Complete: 1-2 minutes						

Question 3 **1 Point**

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

- BUS A/B UV

The Operator reports 0 volts on DC Bus A.

Which of the following components has lost power?

A. MCC DC-1

B. 125 VDC Power Panel E

C. Emergency Seal Oil Pump

D. Turbine Auxiliary Oil Pump

Question # Answer	3 C	Question Developer Initials/Date: NTP 1/21/09

Knowledge and Ability Reference Information						RO	SRO
263000 DC Electrical Distribution K2.01 Knowledge of electrical power supplies to the following: Major DC Loads					Importance Rating	3.1	3.4
Level	RO	**Tier #**	2	**Group #**	1		
References		BR 3028 sh. 1		RAP-9XF1d		ABN-53	
Explanation:	The question stem shows a loss of 125 VDC Bus A. The emergency seal oil pump is powered from this bus and has lost power. Answer C is correct. All other answers are credible but incorrect. Bus A supplies backup DC power to MCC DC-1 and DC-1 remains energized. Answer A is incorrect. 125 VDC Bus A supplies the normal power to DC Power Panel E, but when the normal voltage is lost, it automatically transfers to DC B and remains energized. Answer B is incorrect. The turbine auxiliary oil pumps are AC powered (1A1, 1B1) and are not impacted. Answer D is incorrect.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0012 LO 263-10445 Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.						
Question Source	**Bank**		**Modified Bank**	X	**New**		
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:F	**Comprehension or Analysis**			
10 CFR Part 55 Content:	**55.41**	7	**55.43**				
Time to Complete: 1-2 minutes							

Question 4 **1 Point**

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

- DC-1 PWR LOST

Which of the following states the Isolation Condenser A valves that are affected by this event?

A. **BOTH** shell vent valves

B. **BOTH** steam admission valves

C. **BOTH** condensate return valves

D. **ONE** steam admission valve **AND ONE** condensate return valve

Question # Answer	4 D	Question Developer Initials/Date: NTP 1/22/09

Knowledge and Ability Reference Information						RO	SRO
207000 Isolation (Emergency) Condenser K2.01 - Knowledge of electrical power supplies to the following: Motor operated valves					Importance Rating	3.6	3.8
Level	RO	**Tier #**	2	**Group #**	1		

References	307	148F262	ABN-35

Explanation:	Of the 2 steam admission valves and the 2 condensate return valves in Isolation Condenser A, 1 of each type is operated by a DC motor, supplied from Panel DC-1. Therefore, when DC-1 is lost, as given in the stem, one steam admission valve and one condensate return valve in IC-A is impacted. Answer D is correct, and answers B and C are incorrect. There are no shell vent valves, but there are 2 tube-side vent valves in series, which fail closed on loss of electrical power or loss of air. Answer A is incorrect.
References to be provided during exam:	None
Learning Objective	2621.828.0.0023 LO 02029 Describe the relationship between the Isolation Condenser System and the following: a) Recirculation System; b) Nuclear Steam Supply System; c) Condensate transfer System; d) Demineralized Water System; e) Instrument & Service Air System; f) 480 VAC System; g) 120 VAC System; h) 125 VDC System

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:I	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**	**7**	**55.43**			
Time to Complete: 1-2 minutes						

Question 5 **1 Point**

The plant was shutdown. Present plant conditions are as follows:

- Shutdown Cooling Loops A, B and C are in-service
- RPV water level is in the normal band
- RECIRC PUMP SUCTION TEMPS indicates 183 °F and lowering
- RBCCW and TBCCW are in the normal lineup

The following annunciators then alarmed:

- TBCCW - PUMP 1 TRIP
- TBCCW - PUMP 2 TRIP
- TBCCW – DISCH PRESS LO

The Operator reports that TBCCW Pump 3 indicates running.

Which of the following shall be monitored for high temperatures?

A. Panel 1F/2F recorder for Fuel Pool temperature.

B. Panel 8R recorder for Recirc System MG lube oil temperatures.

C. Panel 3F recorder for Reactor Recirc Pumps Seal Cavity temperatures.

D. A local indicator for Cleanup System Non-Regenerative Heat Exchanger temperature.

Question # Answer	5 B	Question Developer Initials/Date: NTP 1/22/09

Knowledge and Ability Reference Information						RO	SRO
400000 Component Cooling Water K3.01 - Knowledge of the effect that a loss or malfunction of the CCWS will have on the following: Loads cooled by CCWS					Importance Rating	2.9	3.3
Level	**RO**	**Tier #**	**2**	**Group #**	**1**		
References		ABN-20		BR 2006 sh. 1, 5			
Explanation:	The plant is in cold shutdown with SDC in-service. The provided alarms show a total loss of TBCCW, and that no TBCCW pump can be restarted. IAW the ABN-20, systems cooled by TBCCW should be monitored. Of the systems listed, only the recirculation MG sets lube oil coolers are cooled by TBCCW. Answer B is correct. Systems that are cooled by RBCCW are not expected to experience higher temperatures from a loss of TBCCW. The SFP is normally cooled by RBCCW. TBCCW has the ability to provide augmented cooling to the SFP, but the question stem states that TBCCW is in a normal lineup, which does not include the augmented fuel pool cooling. Answer A is incorrect. TBCCW provides cooling to the recirculation MG sets, but RBCCW provides cooling to the recirculation pumps (pump coolers and seal/bearing coolers) inside the DW. Answer C is incorrect. RBCCW provides cooling to the RWCU NRHX. Answer D is incorrect.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0048 LO 274-10453 Explain or describe how this system is interrelated with other plant systems.						

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 2:DR
10 CFR Part 55 Content:	**55.41**	7	**55.43**			
Time to Complete: 1-2 minutes						

Question 6 **1 Point**

Which of the following states the impact if the applied DC voltage to an IRM detector failed to 0 VDC? Assume the IRM was indicating mid-scale during a startup prior to the event.

The IRM will indicate …

A. upscale.

B. downscale.

C. slightly less.

D. slightly more.

Question # Answer	6 B	Question Developer Initials/Date: NTP 1/23/09

Knowledge and Ability Reference Information						RO	SRO
215003 IRM K3.04 - Knowledge of the effect that a loss or malfunction of the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM will have on following: Reactor power indication					Importance Rating	3.6	3.6
Level	RO	**Tier #**	2	**Group #**	1		
References		Fundamentals		RAP-9XF8d RAP-9XF7d			
Explanation:	The IRM detectors are gas filled ion chambers. The DC voltage to the detector is used to attract the ion pairs which are produced from ionization by the incoming charged particle. If this applied voltage fails to zero, there is no longer an applied force to cause the ion pairs to collect at the electrodes. Since the number of ion pairs collected is proportional to the detector output, the detector output will fail downscale since the collected ion pairs fails to zero. Answer B is correct. The other answers are incorrect but plausible if the candidate does not understand how the detector works.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0029 LO 215-10444 Describe the interlock signals and setpoints for the affected system components and expected system response including power loss or failed components.						

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 2:DR
10 CFR Part 55 Content:	**55.41**	**7**	**55.43**			
Time to Complete: 1-2 minutes						

Question 7 **1 Point**

The plant is starting up from an outage. Present plant conditions are as follows:

- SRM 21 indicates $1x10^4$ CPS
- SRM 22 indicates $2x10^4$ CPS
- SRM 23 BYPASSED
- SRM 24 indicates $3x10^4$ CPS
- MASTER DRIVE SELECT switch is in position SRM
- SRM DRIVE SELECT switch is in position 24
- ALL IRMs are on Range 2

The Operator places the IRM-SRM DRIVE CONTROL switch in the OUT position.

The SRM will automatically stop when ....

A. SRM 24 is fully withdrawn.

B. SRM 24 indicates 0.5 CPS.

C. SRM 24 indicates < 500 CPS.

D. The ALL OUT light illuminates.

Question # Answer	7 A	Question Developer Initials/Date: NTP 1/23/09

Knowledge and Ability Reference Information						RO	SRO
215004 Source Range Monitor K4.04 - Knowledge of SOURCE RANGE MONITOR (SRM) SYSTEM design feature(s) and/or interlocks which provide for the following: Changing detector position					Importance Rating	2.8	2.9
Level	RO	**Tier #**	2	**Group #**	1		
References		401.2					
Explanation:	The plant is starting up with the SRM counts as provided. The operator begins to withdraw SRM 24. The SRM has no interlocks which prevent it from moving (except a loss of drive power) so the SRM will continue to drive all the way out and then stop. Answer A is correct. The SRM downscale alarm comes in at 0.5 CPS, but this does not stop the drive motion. Answer B is incorrect. A rodblock will occur in the present reactor mode if an SRM goes below 500 CPS, but again, this will not impede the drive motion. Answer B is incorrect. The ALL OUT light, which is extinguished under the present conditions, comes on when all SRMs are fully withdrawn. If SRM 24 was being withdrawn with the other 3 SRMs already fully withdrawn, then when it got to full out, the all out light would come on, and drive motion would stop. Answer D is incorrect.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0029 LO 215-10444 Describe the interlock signals and setpoints for the affected system components and expected system response including power loss or failed components.						

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:F	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**	7	**55.43**			
Time to Complete: 1-2 minutes						

Question 8 **1 Point**

The plant was at rated power when a small LOCA occurred. Present plant conditions are as follows:

- RPV water level lowered to 122" and now indicates 146" and rising slowly
- RPV pressure indicates 925 psig and lowering slowly
- The following annunciators have alarmed:
  - CORE SPRAY – SYSTEM 1 AUTOSTART
  - CORE SPRAY – SYSTEM 2 AUTOSTART

One minute later, the Operator notes the following valves indicate **RED** light **ON**:

- RBCCW Isolation Valves, V-5-147, V-5-167, and V-5-166
- Reactor Recirc Sample Valves, V-24-29 and V-24-30
- Drywell N_2 Makeup Isolation Valves, V-23-17 and V-23-18
- Drywell Instrument Air/N_2 Isolation Valve, V-6-395

Which of the following valve manipulations is required to maintain Primary Containment integrity?

Manually close the _____ valve(s).

A. RBCCW Isolation

B. Reactor Recirc Sample

C. Drywell N_2 Makeup Isolation

D. Drywell Instrument Air/N_2 Isolation

Question # Answer	8 C	Question Developer Initials/Date: NTP 1/23/09

Knowledge and Ability Reference Information						RO	SRO
223002 PCIS/Nuclear Steam Supply Shutoff K4.03 - Knowledge of PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF design feature(s) and/or interlocks which provide for the following: Manual initiation capability: Plant-Specific					Importance Rating	3.5	3.6
Level	RO	**Tier #**	2	**Group #**	1		
References		RAP-B1e		RAP-B1f		312.9	

Explanation:	The plant was at rated power when a LOCA occurred resulting in a high DW pressure condition and a containment isolation signal (>2.9 psig). Even DW pressure is not provided, the core spray alarms come in from either a high DW pressure OR lo-lo RPV water level (86"). Since RPV water level only went down to 122", then core spray must have started from high DW pressure. All the valves listed are primary containment isolation valves. Of the valves listed, only the Drywell N_2 Makeup Isolation should have closed on a high DW pressure signal and did not. This valve should be manually closed. Answer C is correct. The RBCCW isolation valves will close on a high DW pressure plus an RPV water level lo-lo signal (86") OR an RPV water level lo-lo-lo (64.6"). But, the stem says that RPV water level only lowered to 122". Thus, RBCCW should not have isolated. Answer A is incorrect. The Reactor Recirc Sample valves close on an MSIV isolation signal, which is not a high DW pressure signal and should be open. Answer B is incorrect. The Drywell Instrument Air/N_2 Isolation also closes on an MSIV isolation signal, which is not a high DW pressure signal and should be open. Answer D is incorrect.
References to be provided during exam:	None
Learning Objective	2624.828.0.0032 LO 390 Verbally describe (with or without support materials), the Primary Containment System Fans and isolation valves.

Question Source	Bank		Modified Bank		New	X
Question Cognitive Level:	Memory or Fundamental Knowledge			Comprehension or Analysis		X 3:SPK
10 CFR Part 55 Content:	55.41	7	55.43			
Time to Complete: 1-2 minutes						

Question 9 **1 Point**

The plant was at rated power when a LOCA occurred at Time = 0 seconds.

A timeline of events is shown below:

At Time = 50 seconds, the following conditions exist:

- RPV pressure indicates 600 psig and lowering
- Annunciator ADS TIMER A START I **AND** ADS TIMER A START II are in alarm
- Annunciator ADS TIMER B START I **AND** ADS TIMER B START II are in alarm
- All EMRVS indicate **GREEN** light **ON**
- Core Spray Booster Pumps C **AND** D indicate **GREEN** light **ON**

At Time = 70 seconds:

- The Operator performed an action which alarmed the following annunciators:
  - ADS BYPASSED I
  - ADS BYPASSED II

Which of the following is correct when Time = 120 seconds?

A. All EMRVS indicate **GREEN** light **ON** because Core Spray Booster Pumps C and D are **NOT** running.

B. All EMRVS indicate **GREEN** light **ON** because the Operator actions have de-energized the ADS timers.

C. All EMRVs indicate **RED** light **ON** because all criteria and time delays for the EMRVs to open have been met.

D. All EMRVS indicate **GREEN** light **ON** because the Operator actions have reset the ADS timers for an **ADDITIONAL** time delay.

Question # Answer	9 B	Question Developer Initials/Date: NTP 1/24/09

Knowledge and Ability Reference Information						RO	SRO
218000 ADS K5.01 - Knowledge of the operational implications of the following concepts as they apply to AUTOMATIC DEPRESSURIZATION SYSTEM : ADS logic operation					Importance Rating	3.8	3.8
Level	RO	**Tier #**	2	**Group #**	1		
References		729E182		RAP-B1h	RAP-B5h		

Explanation:

The plant was at power when a small LOCA occurred. With all ADS TIMER START annunciators alarming, then the logic to open the EMRVs has been satisfied and a 105 second timer is counting down. When the times makes it to 0, then 2 EMRVs open immediately, 1 EMRV will open at 1.5 seconds later, and 2 EMRVs will open at the 3.25 second later mark.

But, the operator action that resulted in the ADS BYPASS annunciators (placing the ADS TIMER switches to bypass, as directed in the EOPs) will act to de-energize the ADS timers such that ADS cannot ever automatically initiate, until other operator actions are first taken. Answer B is correct.

Part of the ADS timer initiation is core spray booster pump ΔP. Under the conditions given, core spray systems C and D do not start, and the core spray booster pump ΔP is fulfilled by the A and C loops (which do normally start). Thus, these pumps should not have started but did not impact the ability of ADS to initiate. Answer A is incorrect.

If no operator actions had taken place, then after 110 seconds (50+60), all EMRVs would have been opened. But since the times never made it down to 0 seconds, the EMRVs have remained closed. Answer C is incorrect.

As noted before, the operator action de-energized the ADS timers – it did not reset them to start counting down from 105 again. Answer D is incorrect.

References to be provided during exam:	None	
Learning	2621.828.0.0005 LO 00379	

Objective	Describe the operation of the ADS controls including: 1) Resetting ADS timers; 2) Bypassing ADS timers; 3) Disabling ADS; 4) Clearing and resetting ADS auto initiation signals; 5) Removal of ADS control logig fuses to close EMRVs; 6) Obtaining readings from EMRV temperature indicators

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**	5	**55.43**			
Time to Complete: 1-2 minutes						

Question 10 **1 Point**

Which statement below describes the action required to **ENSURE** station air compressor 1-3 cycles at the correct pressure when being configured as the backup (Lag) compressor?

A. Local control switch must be placed in STANDBY.

B. Local control switch must be placed in SELECTED.

C. Control Room switch must be placed in NORMAL AFTER STOP.

D. Control Room switch must be placed in NORMAL AFTER START.

Question # Answer	10 A	Question Developer Initials/Date: NTP 1/24/09

Knowledge and Ability Reference Information						RO	SRO
300000 Instrument Air K5.01 - Knowledge of the operational implications of the following concepts as they apply to the INSTRUMENT AIR SYSTEM: Air compressors					Importance Rating	2.5	2.5
Level	RO	**Tier #**	2	**Group #**	1		
References	334						
Explanation:	IAW the reference, to place air compressor as the lag compressor, the local loading switch must be in the standby position. Answer A is correct. Placing the local loading switch in the selected position will place the compressor as the lead compressor. Answer B is incorrect. Answers C and D are incorrect since these switches are independent of the local switch positions and do not ensure the compressor works as the lag compressor.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0043 LO 279-10444 Describe the interlock signals and setpoints for the affected system components and expected system response including power loss or failed components.						

Question Source	Bank	X	Modified Bank		New	
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:F	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**	5	**55.43**			
Time to Complete: 1-2 minutes						

Question 11 **1 Point**

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

- RPV water level is in the normal band
- Shutdown Cooling Pumps B and C are in-service
- RBCCW Pumps 1-1 and 1-2 are in-service
- All Recirculation Pumps are in-service
- The Auxiliary Reactor Water Cleanup System Pump is in-service

The following annunciator then alarms:

- LKOUT RELAY 86/S1A TRIP

Which of the following actions is required in relation to the Shutdown Cooling System?

A. Start Shutdown Cooling Pump A.

B. Manually re-start RBCCW Pump 1-1.

C. Close Recirculation Pump E discharge valve.

D. Shutdown the Reactor Water Cleanup System.

Question # Answer	11 C	Question Developer Initials/Date: NTP 1/24/09

Knowledge and Ability Reference Information						RO	SRO
205000 Shutdown Cooling K6.01 - Knowledge of the effect that a loss or malfunction of the following will have on the SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) : A.C. electrical power					Importance Rating	3.3	3.4
Level	**RO**	**Tier #**	**2**	**Group #**	**1**		
References	305 TS Table 3.1.1		ABN-3		237E798		

Explanation:

The plant is in cold shutdown and is cooling down with SDC, when power is lost to 4160 VAC Bus 1A (the provided alarm shows a lockout and loss of startup transformer 1A, which was currently powering 4160 Bus 1A). This will also remove power from 4160 VAC Bus 1C, and EDG1 will auto start and load onto Bus 1C.

The SDC system takes a suction on recirculation pump E suction line, and discharges to recirculation pump E discharge line. When the recirculation pump is in service, there are no problems. But when recirculation pump E is tripped, then SDC can be short-cycled through the recirculation loop, unless the recirculation loop discharge valve is closed. This action is prescribed in the SDC normal procedure. The discharge valve does have power to close under the given conditions.

When 4160 VAC Bus 1A is lost, power to recirculation pump E is lost, and its discharge valve must be manually closed to prevent short-cycling in SDC. Answer C is correct.

When Bus 1C power is lost, power is also lost to 460 VAC USS Bus 1A2, which powers RBCCW Pump 1-1. But when EDG1 starts and loads, then RBCCW Pump 1-1 will auto start after about 166 seconds. Thus, there is no need to manually restart the RBCCW pump. Answer B is incorrect.

Since SDC pumps B and C (initially running) are powered from 460 VAC USS Bus 1B2, which is not impacted from the initial Bus 1A2 power loss, then the same number of SDC pumps and RBCCW pumps will be running after 166 seconds. Thus, the amount of cooling to the RPV has not been diminished. There is no need to start

	another SDC pump. Answer A is incorrect. In the loss of SDC ABN, if SDC flow is inadequate, the procedure states to reduce the load on RBCCW such as RWCU. Also, the RWCU pump that was initially running has tripped due to the initial loss of power. Even if there was a need to reduce the load on RBCCW, the RWCU pump has already tripped. Answer D is incorrect.

References to be provided during exam:	None	

Learning Objective	2624.828.0.0045 LO 205-10447 Given normal operating procedures and documents for the system, describe or interpret the procedural steps.

Question Source	**Bank**	X	**Modified Bank**		**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**	7	**55.43**			
Time to Complete: 1-2 minutes						

Question 12 **1 Point**

The plant was at rated power when a total loss of offsite power occurred.

Which of the following represents the **MINIMUM** re-energized Busses required to allow ADS to automatically initiate (**neglect** instrumentation busses)?

A. Bus 1D and USS 1B2.

B. Bus 1C and USS 1A1.

C. Bus 1B, 1D, and USS 1B2.

D. Bus 1C, USS 1A1 and USS 1A2.

Question # Answer	12 A	Question Developer Initials/Date: NTP 1/26/09

Knowledge and Ability Reference Information						RO	SRO
239002 SRVs K6.03 - Knowledge of the effect that a loss or malfunction of the following will have on the RELIEF/SAFETY VALVES : A.C. power					Importance Rating	2.7	2.9
Level	RO	**Tier #**	2	**Group #**	1		
References		RAP-B1g		RAP-B2g			
Explanation:	The plant is at rated power when all offsite and onsite AC power sources are lost. ADS logic is supplied by DC power, as are the solenoids necessary to open the EMRVs. But, part of the logic requires a core spray booster pump Δp. This pump Δp acts to show that core spray is energized and ready for injection when RPV pressure drops. A core spray pump should be running (Bus 1C or 1D) and supplying a suction to its core spray booster pump (on Bus 1A2 or 1B2). Thus, Bus 1D and USS 1B2 (or 1C and USS 1A2) need to be energized to allow the core spray pump and the associated core spray booster pump ΔP to allow ADS initiations. The other answers are plausible if the candidate does not know the electrical distribution system or the ADS logic. All other listed busses are 4160 volt or 460 volt busses.							
References to be provided during exam:	None						
Learning Objective	2621.828.0.0005 LO 00369 State how the following systems interrelate with ADS: 1) Vessel and Primary Containment Instrumentation; 2) Core Spray; 3) NSSS; 4) Vital AC Power; 5) 125 VDC Power						

Question Source	Bank		Modified Bank		New	X
Question Cognitive Level:	Memory or Fundamental Knowledge		X 1:F	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41	7	55.43			
Time to Complete: 1-2 minutes						

Question 13 **1 Point**

The plant was at rated power when a manual scram was inserted. No control rods inserted and the Operator has initiated Standby Liquid Control System 2.

If the Discharge Header Isolation valve, V-19-25, were locked **CLOSED** instead of open, how would this effect the Control Room indications? (See drawing GE 148F723, location E-7)

	Reactor Water Cleanup System	SLC System 2 SQUIBS light	SLC DISCH PRESS
A.	**NOT** isolated	OFF	< RPV Pressure
B.	**NOT** isolated	ON	> RPV Pressure
C.	Isolated	OFF	< RPV Pressure
D.	Isolated	ON	> RPV Pressure

Question # Answer	13 B	Question Developer Initials/Date: NTP 1/26/09

Knowledge and Ability Reference Information						RO	SRO
211000 SLC A1.04 - Ability to predict and/or monitor changes in parameters associated with operating the STANDBY LIQUID CONTROL SYSTEM controls including: Valve operations					Importance Rating	3.6	3.7
Level	RO	**Tier #**	2	**Group #**	1		
References		148F723 Note: Delete Note 10 on the drawing		304		RAP-G1b	
Explanation:	The plant is at power when an ATWS occurred and the operator has initiated SLC system 12. The closed valve in the question stem is between the SLC pump discharge and the flow switch which isolates RWCU. Thus this switch shows no flow, and RWCU is not isolated. Other indications include the SLC pump discharge pressure, which is still a valid reading, shows greater than RPV pressure, the squibs light (which shows that the explosive valve has discharged) and the pumps on light are ON. Answer b is correct. All other answers are incorrect but plausible if the candidate does not know the expected indications, or does not know why/what isolated the RWCU system.						
References to be provided during exam:		148F723 Note: Delete Note 10 on the drawing					
Learning Objective	2621.828.0.0046 LO 211-10438 Using the system P&ID, locate each of the system components and explain its operation and limitations within the system.						

Question Source	**Bank**	X	**Modified Bank**		**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPR
10 CFR Part 55 Content:	**55.41**	**5**	**55.43**			
Time to Complete: 1-2 minutes						

Question 14 **1 Point**

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

- STANDBY GAS SELECT is in position SYS 1
- Surveillance test 651.4.001, Standby Gas Treatment System Test, is in-progress
- The refuel floor area radiation monitor Trip and Indicator Unit has just been adjusted above its high setpoint IAW the surveillance

30 seconds **AFTER** the SGT System initiated, the following annunciator alarmed:

- H&V RX BLDG SGTS - TRAIN A FLOW LO

Which of the following shows the expected position of the SGTS valves listed **ONE MINUTE** later?

	SGTS 1 Inlet/Outlet Valves	SGTS 2 Inlet/Outlet Valves	SGTS Orifice Valve
A.	Open	Closed	SGTS 1: Open
B.	Open	Open	SGTS 1: Closed
C.	Closed	Closed	SGTS 2: Open
D.	Closed	Open	SGTS 2: Closed

Question # Answer	14 D	Question Developer Initials/Date: NTP 1/26/09

Knowledge and Ability Reference Information						RO	SRO
261000 SGTS A1.01 - Ability to predict and/or monitor changes in parameters associated with operating the STANDBY GAS TREATMENT SYSTEM controls including: System flow					Importance Rating	2.9	3.1
Level	RO	**Tier #**	2	**Group #**	1		
References		330		RAP-L2b	651.4.001		

Explanation:	The plant is at power with the SGTS surveillance in service. SGTS 1 is selected as the lead system. When the refuel floor area radiation monitor B9 is taken to its high setpoint, it signals both loops of SGTS to start after a 2 minute time delay. There is no flow indication on the control room panels where the SGTS controls are located. But, valve positions are provided, which can be used to infer system flow. After the time delay, both SGT trains start. If all goes as designed, then after 2.5 minutes later, the non-selected SGTS fan (in this case would be SGTS 2) will shutdown and the inlet/outlet valves close. If a low flow condition is detected in the selected train during the initial 2.5 minute period, the inlet/outlet valves to the selected fan are closed, the selected train orifice valve is opened, the inlet/outlet valves for the non-selected train remain open with the non-selected fan running, and the non-selected orifice valve closes. Answer D is correct. The other answers are incorrect but plausible if the candidate does not understand the meaning of the annunciator or does not know the system response.
References to be provided during exam:	None
Learning Objective	2621.828.0.0042 LO 261-10446 Identify and explain system operating controls/indications under all plant operating conditions.

Question Source	**Bank**		**Modified Bank**	X	**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**	5	**55.43**			
Time to Complete: 1-2 minutes						

Question 15 **1 Point**

The plant was at rated power when the following indications were noted:

- Annunciator FCS/RFCS TROUBLE alarmed
- TOTAL STEAM FLOW on Recorder ID75 (Panel 5F/6F) indicated 3.6 Mlb/hr
- APRMs still indicate rated power

Which of the following states the impact on the Feedwater Control System (FWCS), and what actions are required?

	FWCS Impact	Required Action
A.	DCC-X transfers to DCC-Y, with 2 viable steam flow inputs	Verify DCC transferred
B.	The Digital Feedwater Control System transfers to single-element control	Confirm RPV water level is stable
C.	DCC-X remains in control in 3-element control	Check DCC lights and PPC for status
D.	The Digital Feedwater Control System will rapidly start to lower feedwater flow	Take manual control of the Feedwater System

Question # Answer	15 C	Question Developer Initials/Date: NTP 1/26/09

Knowledge and Ability Reference Information					RO	SRO
259002 Reactor Water Level Control A2.01 - Ability to (a) predict the impacts of the following on the REACTOR WATER LEVEL CONTROL SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of any number of main steam flow inputs				Importance Rating	3.3	3.4
Level	RO	Tier #	2	Group #	1	
References	MDD-OC-625-B DIV I (p.20 of 71)					

Explanation:

The plant is at rated power (7.2 Mlb/hr steam flow) when an annunciator alarms and indicated steam flow goes to ½ the original value. Digital Control Computer (DCC)-X is in control with DCC-Y as a backup.

IAW the reference, the system will ignore the now 'bad' steam flow signal, and will double to still good signal. There is no transfer to DCC-Y, RPV water level will remain stable in 3-element control, and no immediate operator actions are required. IAW the RAP, check for cause of the alarm is the expected response. Thus, DCC-X remains in 3-element control, and the operator should check the DCC and PPC for status. Answer C is correct.

Answer A is plausible, since DCC-Y is there if DCC-X fails, but the loss of a single steam transmitter will not fail DCC-X. Answer A is incorrect.

Under certain conditions, the control system could shift to single element control but not under the given conditions. Answer B is incorrect.

If the control system did see actual steam flow as ½ the original value (and not as a failed transmitter), then it would have acted to reduce feedwater flow to prevent a high RPV water level condition. Answer D is incorrect.

References to be provided during exam:	None	

Learning Objective	2621.828.0.0018 LO 259-10444 Describe the interlock signals and setpoints for the affected system components and expected system response including power loss or failed components.

Question Source	**Bank**		**Modified Bank**	X	**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**	5	**55.43**			
Time to Complete: 1-2 minutes						

Question 16 **1 Point**

The plant was at rated power when a LOCA occurred. Present plant conditions are as follows:

- RPV pressure indicates 360 psig
- RPV water level indicates 80" and lowering
- Bus 1B was de-energized 5 minutes ago
- EDG 2 has tripped on overspeed

Which of the following lists RPV injections systems that have been **LOST** and injection systems which can inject **NOW**? (Note: Each list may **NOT** list **ALL** systems)

	Injection Systems Lost	**Systems Can Inject Now**
A.	• Feedwater Pump B & C • SLC Pump B • Core Spray B & C	• Feedwater Pump A • SLC Pump A • Core Spray A & D
B.	• CRD Pump B • SLC Pump B • Core Spray A & D	• CRD Pump A • SLC Pump A • Core Spray B & C
C.	• Feedwater Pump B & C • SLC Pump B • Core Spray B & C	• Feedwater Pump A • SLC Pump A • CRD Pump A
D.	• Feedwater A & C • CRD Pump A • SLC Pump A	• Feedwater Pump B • CRD Pump B • SLC Pump B

Question # Answer	16 C	Question Developer Initials/Date: NTP 1/26/09

Knowledge and Ability Reference Information						RO	SRO
209001 LPCS A2.03 - Ability to (a) predict the impacts of the following on the LOW PRESSURE CORE SPRAY SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A.C. failures					Importance Rating	3.4	3.6
Level	**RO**	**Tier #**	**1**	**Group #**	**1**		
References		EMG-SP9		341		BR 3001A BR 3001B	
Explanation:	The plant was at rated power when a LOCA occurred. Bus 1B has been de-energized due to a fire. When this occurred, EDG 2 auto started and loaded onto Bus 1D. A lockout has occurred on EDG 2 and its output breaker opens, de-energizing Bus 1D and its loads. When Bus 1B was lost 5 minutes ago, feedwater pumps B & C were lost. Feedwater pump A (supplied from Bus 1A) is still available. When EDG 2 was lost, this resulted in the loss of Core spray B & C, CRD Pump B (USS 1B2) and SLC Pump B (MCC 1B21). Core Spray Pumps A & D are still available, as are Feedwater Pump A, CRD Pump A and SLC Pump A. But because RPV pressure is above the core spray parallel isolation valve open-setpoint of 305 psig, core spray cannot be used now to inject. FW Pump A, CRD Pump A and SLC Pump A can all inject now. Answer C is correct. Answer A is incorrect since core spray cannot be used to inject now. Answer B is incorrect since core spray Pumps B & C are lost – not core spray pumps A & D, and because core spray pumps B & C cannot inject. Answer D is incorrect since most pumps listed as lost are actually available from the opposite power supply as EDG 2.						
References to be provided during exam:	None						
Learning	2621.828.0.0016 LO 262-10445						

Objective	Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.					
Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**	5	**55.43**			
Time to Complete: 1-2 minutes						

Question 17 **1 Point**

The plant was at 96% power and stable. Provided below are the LPRM readings which input into APRM 7:

1. 04-25D 97%
2. 04-25B 94%
3. 20-25D 93%
4. 20-25B 98%
5. 12-17D 96%
6. 12-17B Failed upscale and is **BYPASSED**
7. 20-09D 97%
8. 20-09B Oscillating between 85-95% and is **BYPASSED**

The Operator is performing the drawer Count IAW procedure 202.1 and 403.

Which of the following states the **APRM DRAWER** indication when (1) the INPUT switch is taken to COUNT; and (2) the INPUT switch is taken to the LPRM 12-17B position?

	Count Position	LPRM 12-17B Position
A.	100	0
B.	80	150
C.	60	0
D.	60	150

Question # Answer	17 C	Question Developer Initials/Date: NTP 1/27/09

Knowledge and Ability Reference Information						RO	SRO
215005 APRM / LPRM A3.03 - Ability to monitor automatic operations of the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM including: Meters and recorders					Importance Rating	3.3	3.3
Level	RO	**Tier #**	2	**Group #**	1		
References	403		202.1				
Explanation:	The APRM drawer count is being performed while at power. When the input switch is taken to the count position, it counts how many LPRMs are not bypassed into the APRM. Each LPRM equals 10 so that when all 8 LPRMs are valid, the count reading is 80. Since 2 LPRMs are bypassed, the count drops to 60. When the input switch is taken to LPRM 12-17B, it sees the LPRM as bypassed and displays a 0 output. Answer C is correct. The other answers are incorrect but plausible if the candidate does not know the count logic or how a bypassed LPRM is displayed.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0029 LO 215-10446 Identify and explain system operating controls/indications under all plant operating conditions.						

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:I	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**	**7**	**55.43**			
Time to Complete: 1-2 minutes						

Question 18 **1 Point**

The plant was at rated power when an event occurred which resulted in a fast start of EDG 1 **ONLY**.

10 minutes later, the following annunciator alarmed:

- EDG 1 ENG TEMP HI (@ 200 °F cooling water temperature)

Which of the following states the cause for this alarm?

A. The Turbocharger Oil Pump AC-driven motor is de-energized.

B. The louver control system has adjusted the louvers to the close position.

C. The immersion heater is energized and is **DIRECTLY** heating the engine oil.

D. The right bank and left bank water pumps have failed to auto start at 175 °F.

Question # Answer	18 B	Question Developer Initials/Date: NTP 1/27/09

Knowledge and Ability Reference Information					RO	SRO
264000 EDGs A3.06 - Ability to monitor automatic operations of the EMERGENCY GENERATORS (DIESEL/JET) including: Cooling water system operation				Importance Rating	3.1	3.2
Level	**RO**	**Tier #**	**2**	**Group #**	**1**	
References		RAP-T6b		LP 2621.828.0.0013	3E-861-21-1001	

Explanation:

The plant was at power when EDG1 fast started. 10 minutes later, an annunciator shows that there is a high temperature condition of the EDG cooling water.

The EDG utilizes 2 cooling water pumps (right bank and left bank), which are driven indirectly from the main shaft. As the main shaft turns, the cooling pumps also turn and these pumps do not auto start on temperature. Answer D is incorrect.

The cooling water pumps provide cooling water to the engine, which returns to 2 air-to-water radiators. The cooling water system opens/closes louvers to modulate the amount of outside air which is moved through the radiators. A higher temperature calls for further opening of the louvers. At the alarm point provided in the question, the louvers should be at the 100% open position. Answer B is correct.

The purpose of the turbocharger oil pump is to provide oil to the turbocharger bearing when the unit is shutdown. Engine driven oil pumps provide the necessary oil during engine operation. Answer A is incorrect.

The immersion heater could be energized which would add heat, but the heater heats only the cooling water directly and not the oil directly. Answer C is incorrect.

References to be provided during exam:	None	

Learning Objective	2621.828.0.0013 LO 264-10449 State the function and interpretation of system alarms, alone and in combination, as applicable in accordance with the system RAPs.

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:I	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**	**7**	**55.43**			
Time to Complete: 1-2 minutes						

Question 19 **1 Point**

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

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

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

A. CRD Pump A

B. Feedwater Pump B

C. Core Spray Main Pump NZ01D

D. Containment Spray Pump 51B

Question # Answer	19 B	Question Developer Initials/Date: NTP 1/27/09

Knowledge and Ability Reference Information						RO	SRO
263000 DC Electrical Distribution A4.01 - Ability to manually operate and/or monitor in the control room: Major breakers and control power fuses					Importance Rating	3.3	3.5
Level	RO	**Tier #**	2	**Group #**	1		
References		3033		3001B 3001C		3002	
Explanation:	The question stem shows a low voltage condition on 125 VDC Bus C. It also shows that both chargers to Bus C show no current and that the C Battery also shows no current. These conditions depict a fault on 125 VDC Bus C and that both the chargers and the battery are disconnected from Bus C. DC Bus C provides the DC control power for remote breaker operation for 4160 VAC Bus 1A, 4160 VAC Bus 1C, 460 VAC Busses 1A1, 1A2, and 1A3. With breaker control power gone, there is no longer remote control of the breakers on the AC busses from the control room. CRD Pump A is powered from USS Bus 1A2, and thus has no DC power. Answer A is incorrect. Feedwater Pump B is powered from Bus 1B, and thus has DC power. Answer B is correct. Core spray main pump NZ01D is powered from Bus 1C, and thus has no DC power. Answer C is correct. Containment Spray Pump 51B is powered from USS 1A2, and thus has no DC power. Answer D is incorrect.							
References to be provided during exam:	None						
Learning Objective	2621.828.0.0017 LO 259-10453 Explain or describe how this system is interrelated with other plant systems.						

Question Source	**Bank**		**Modified Bank**	X	**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**	**7**	**55.43**			
Time to Complete: 1-2 minutes						

Question 20 **1 Point**

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

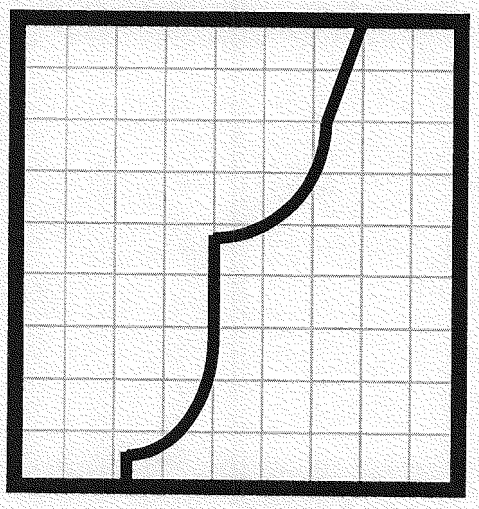
Which of the following SRM charts shows that the reactor is critical with the **LONGEST** period? (**See attached**)

A. A

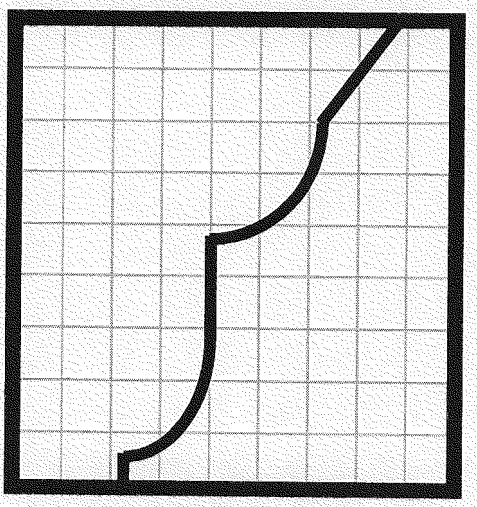
B. B

C. C

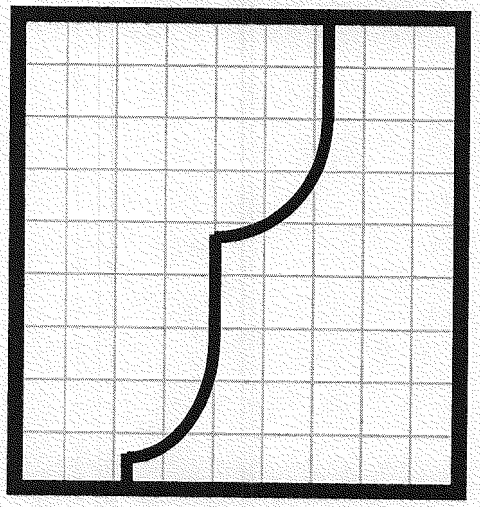
D. D



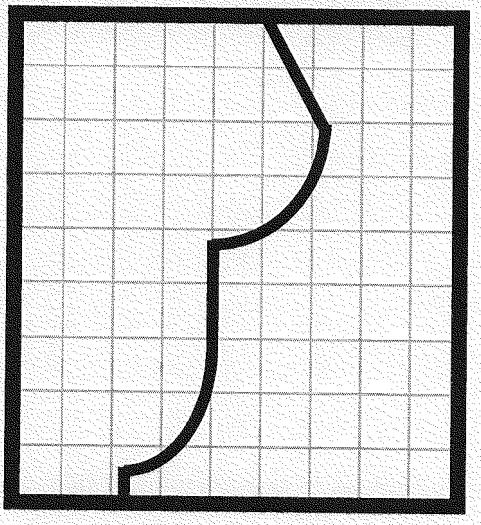
A



B



C



D

Question # Answer	20 A	Question Developer Initials/Date: NTP 1/27/09

Knowledge and Ability Reference Information						RO	SRO
215004 Source Range Monitor A4.02 - Ability to manually operate and/or monitor in the control room: SRM recorder					Importance Rating	3.0	3.1
Level	RO	**Tier #**	2	**Group #**	1		
References		201					
Explanation:	The reactor has just been declared critical during a startup. When declared critical, the reactor state is actually slightly supercritical with counts rising at a constant rate. Procedure 201 defines the reactor is critical when neutron flux is increasing with a stable positive period, without additional control rod movement. 4 SRM charts are provided. SRM counts goes from left to right increasing. The top of each trace represents the current time and time goes from top to bottom increasing. Trace A shows a constant increase in counts, with a smaller slope than that in trace B, which is also critical. Answer A is correct. Trace C shows constant counts at the top of the trace and trace D shows lowering counts at the top of the trace. The candidate must recognize the reactor state when declared critical and must also know that counts is on the horizontal axis and time is on the vertical axis.							
References to be provided during exam:	Calculator						
Learning Objective	2621.828.0.0029 LO 215-10445 Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.						

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**	7	**55.43**			
Time to Complete: 1-2 minutes						

Question 21 **1 Point**

The plant was at rated power when a control rod drop accident occurred. The following annunciators then alarmed:

- RADIATION MONITOR PROCESS – OFFGAS HI
- RADIATION MONITOR PROCESS – OFFGAS HI HI
- MAIN STEAM – RAD HI

The operator reports that all MAIN STEAM LINE RAD MONITORS indicate > 1000 mr/hr and offgas radiation is rising. The SRO directed a manual reactor scram and **ALL** control rods inserted.

Which of the following states how reactor pressure shall be controlled?

A. Close the MSIVs and control RPV pressure with the Isolation Condensers.

B. Close the MSIVs and control RPV pressure with the Isolation Condenser vents.

C. Leave the MSIVs open and control RPV pressure 800 – 1000 psig with the Turbine Bypass valves.

D. Leave the MSIVs open and control RPV pressure 500 - 600 psig with the Turbine Bypass valves.

Question # Answer	21 A	Question Developer Initials/Date: NTP 2/20/09

Knowledge and Ability Reference Information						RO	SRO
207000 Isolation Condenser 2.4.8 - Emergency Procedures / Plan: Knowledge of how abnormal operating procedures are used in conjunction with EOP's					Importance Rating	3.8	4.5
Level	**RO**	**Tier #**	**2**	**Group #**	**1**		
References		ABN-26		RPV Control - No ATWS EOP			
Explanation:	The plant is at rated power when a control rod drop accident occurred, which has resulted in gross fuel failures. Both offgas and main steam show a large rise in radiation levels. The SRO directs a manual scram and all control rods insert. IAW ABN-26, with MSL radiation levels > 800 mrem/hr and offgas radiation rising, the MSIVs and the isolation condenser vents shall be manually closed. IAW the RPV Control – No ATWS EOP (pressure leg), it says to stabilize RPV pressure below 1040 psig using the turbine bypass valves. But the MSIVs will be manually closed and other systems used to control RPV pressure. Since the MSIVs will be closed, then answers C and D are incorrect. Since the isolation condenser vents will also be closed, then this cannot be used as a vent path and answer B is incorrect. The EOP does allow the use of the isolation condensers. Answer A is correct.						
References to be provided during exam:	None.						
Learning Objective	2621.828.0.0030 LO 01034 State the function and interpretation of NSSS alarms.						

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**	10	**55.43**			
Time to Complete: 1-2 minutes						

Question 22 **1 Point**

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

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

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

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

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

Which of the following actions would have the **GREATEST** impact on maintaining control of RPV water level?

A. Close all LFRVs

B. Trip all Condensate Pumps

C. Place Core Spray Parallel Isolation Valves in CLOSE

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

Question # Answer	22 D	Question Developer Initials/Date: NTP 2/20/09

Knowledge and Ability Reference Information						RO	SRO
259002 Reactor Water Level Control 2.4.9 - Emergency Procedures / Plan: Knowledge of low power / shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.					Importance Rating	3.8	4.2
Level	RO	**Tier #**	2	**Group #**	1		
References		201		EMG-SP10		RAP-H1d	

Explanation:	The plant is shutdown and cooling down with SDC. At a coolant temperature of 300 °F, this equates to an RPV pressure of 53 psig. At this reactor power level, feedwater flow is minimal (one condensate pump running through a LFRV). A leak then occurs in the drywell and steadies out at 8 gpm, when the drywell pressure scram and isolation setpoint is reached (as provided by the given annunciators). This same parameter results in the start of core spray, and since RPV pressure is < 305 psig, the core spray parallel isolation valves will open immediately. At this pressure, each loop of core spray will inject several thousand GPM to the RPV. To stop core spray with an initiation signal present, the signals must first be overridden, then the core spray pumps can be stopped. Since core spray is adding water to the RPV at the largest rate, as compared to condensate, then securing core spray has the largest impact on controlling RPV water level. Answer D is correct. Closing the only in-service LFRV and stopping the only running condensate pump are very similar in their impacts, but their flow is much less than core spray. Answers A and B are incorrect. Because there is a core spray initiation signal present, placing the core spray parallel isolation valve switches to close will not result in the valves going and remaining closed. Answer C is incorrect.
References to be provided during exam:	Attachment 201-7
Learning Objective	2621.828.0.0010 LO 209-10446 Identify and explain system operating controls and indications under

	all plant operating conditions.					
Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**	10	**55.43**			
Time to Complete: 1-2 minutes						

Question 23 **1 Point**

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

- RPS MG SET 1 TRIP

Which of the following states the impact on indicated power?

A. **ALL** ARPMs indicate 50%

B. **ALL** APRMs indicate 100%

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

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

Question # Answer	23 D	Question Developer Initials/Date: NTP 2/23/09

Knowledge and Ability Reference Information						RO	SRO
212000 RPS A4.05 - Ability to manually operate and/or monitor in the control room: Reactor power					Importance Rating	4.3	4.3
Level	**RO**	**Tier #**	**2**	**Group #**	**1**		
References	RAP-9XF3a						
Explanation:	The annunciator provided shows a loss of RPS MG Set 1. This failure has results in the loss of APRMs 1-4, which will indicate 0% power. APRMs 5-8 will continue to indicate normal. Answer D is correct. Answer A is incorrect since the power loss does not impact ½ of the APRMs, and there was no resultant reactor power reduction. Answer B is incorrect since ½ of the APRMs read downscale. Answer C is incorrect since it lists the wrong APTMs affected.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0029 LO 215-10444 Describe the interlock signals and setpoints for the affected system components and expected system response including power loss or failed components.						

Question Source	Bank		Modified Bank		New	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**		**X** **1:F**	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**	**7**	**55.43**			
Time to Complete: 1-2 minutes						

Question 24 **1 Point**

The plant was at low power when a single annunciator alarmed:

- SV/EMRV NOT CLOSED

The Operator reports the following indications:

- EMRV NR108A shows in the VALVE OPEN REGION
- TORUS TEMP BULK DIV 1 indicates 81 °F and rising very slowly
- ALL EMRVs indicates **GREEN** light **ON** and **RED** light **OFF**
- RPV water level indicates at the setpoint and steady

Which of the following states the plant impact and the **NEXT** required action IAW ABN-40, Stuck Open EMRV?

	Plant Impact	NEXT Required Action
A.	EMRV NR108A is leaking by	Place AUTO DEPRESS VALVE NR108A switch to OFF
B.	EMRV NR108A is leaking by	Place the MASTER FEEDWATER LEVEL CONTROLLER in MAN
C.	EMRV NR108A is open	Initiate Torus cooling IAW the Primary Containment Control EOP
D.	EMRV NR108A is open	Place the NR108A EMRV NORMAL/DISABLE switch in DISABLE

Question # Answer	24 B	Question Developer Initials/Date: NTP 2/23/09

Knowledge and Ability Reference Information						RO	SRO
239002 SRVs A2.02 - Ability to (a) predict the impacts of the following on the RELIEF/SAFETY VALVES ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Leaky SRV					Importance Rating	3.1	3.2
Level	RO	**Tier #**	2	**Group #**	1		
References	ABN-40						
Explanation:	The plant was at low power when leakage through EMRV NR108A is indicated (as indicated by red light not lit, and EMRV annunciator not in alarm). The indications provide several other expected indications for this condition (Torus temperature rising). Entry into ABN-40, Stuck Open EMRV, is required. If a FW transient is in progress, the ABN directs that the Operator wait until it stabilizes, then place FW control in manual. If there is no FW transient, then placing FW control in manual is still required. Once in manual, then manipulation of the EMRV switch can commence IAW the ABN. Therefore, the EMRV is leaking by, and the FW controller shall be placed in manual. Answer B is incorrect. Answer A has the correct impact, but the incorrect next ABN step. Answers C & D are incorrect and plausible if the candidate didn't understand what bring is the provided alarm and what brings in the second EMRV open alarm, which did not alarm.							
References to be provided during exam:	None						
Learning Objective	2621.828.0.0005 LO 00375 Given ADS alarms and indications, evaluate them in terms of limits and trends.						

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**	**5**	**55.43**			
Time to Complete: 1-2 minutes						

Question 25 **1 Point**

The plant is at rated power.

Which of the following signals will result in the following annunciator alarming:

- MN BRKR 1A 86 LKOUT TRIP

A. Overcurrent

B. Overvoltage

C. Undervoltage

D. Underfrequency

Question # Answer	25 A	Question Developer Initials/Date: NTP 2/23/09

Knowledge and Ability Reference Information						RO	SRO
262001 AC Electrical Distribution K4.01 - Knowledge of A.C. ELECTRICAL DISTRIBUTION design feature(s) and/or interlocks which provide for the following: Bus lockouts					**Importance Rating**	3.0	3.4
Level	RO	**Tier #**	2	**Group #**	1		
References	RAP-S2e						
Explanation:	IAW the reference, the lockout will occur as a result of overcurrent: answer A is correct. The other answers are incorrect but plausible in that they are electrical related trips. For example, the RPS EPA breakers will trip on an UV, OV or UF signal.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0016 LO 262-10449 State the function and interpretation of system alarms, alone and in combination, as applicable in accordance with the system RAPs.						
Question Source	**Bank**		**Modified Bank**		**New**	X	
Question Cognitive Level:	**Memory or Fundamental Knowledge**	X 1:F	**Comprehension or Analysis**				
10 CFR Part 55 Content:	**55.41**	7	**55.43**				
Time to Complete: 1-2 minutes							

Question 26 **1 Point**

The plant was at rated power with the following DC electrical lineup:

- Battery Charger MG A is supplying DC Bus A
- Battery Charger MG B is supplying DC Bus B
- Battery Charger C1 is supplying DC Bus C

An event has then occurred. The Operator reported the following observations:

- A BATTERY DC AMPS indicates > 0 (discharge)
- B BATTERY DC AMPS indicates > 0 (discharge)
- C BATTERY DC AMPS indicates < 0 (charge)
- RBCCW Pump 1-2 indicates running

Given **ONLY** the above indications, entry into which of the following ABNs is required?

A. ABN-45, Loss of USS 1A2

B. ABN-48, Loss of USS 1B2

C. ABN-50, Loss of VMCC 1A2

D. ABN-51, Loss of VMCC 1B2

Question # Answer	26 D	Question Developer Initials/Date: NTP 2/23/09

Knowledge and Ability Reference Information						RO	SRO
263000 DC Electrical Distribution A3.01 - Ability to monitor automatic operations of the D.C. ELECTRICAL DISTRIBUTION including: Meters, dials, recorders, alarms, and indicating lights				**Importance Rating**		3.2	3.3
Level	RO	**Tier #**	2	**Group #**	1		
References	ABN-51		D-3033		3013 sh. 1		
Explanation:	The plant is at power when an event occurred. The only normal indication is that for DC Bus C. The given indications show also that DC Battery A and DC Battery B amps is NOT normal (meaning that current is out of the batteries). Both the MG SET A and MG SET B chargers are powered from VMCC 1B2. The stem also shows that RBCCW Pump 1-2 is running, which is supplied from USS 1B2, and thus USS 1B2 is still powered. Therefore, VMCC 1B2 has lost power and entry into ABN-51 is correct. Answer D is correct. Since RBCCW Pump 1-2 is running, power has not been lost to USS 1B2 and answer B is incorrect. If the Candidate confuses power supplies or thinks that Battery C is not normal, then the other answers may appear correct.							
References to be provided during exam:	None						
Learning Objective	2621.828.0.0012 LO 263-10445 Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.						

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 2:DR
10 CFR Part 55 Content:	**55.41**	**7**	**55.43**			
Time to Complete: 1-2 minutes						

Question 27 **1 Point**

The plant is at rated power, with no control rod manipulations in-progress. It has been determined that the CRDM ball check valve for control rod 22-35 (currently at position 24) is stuck in its current, normal position.

Which of the following states the impact on the movement of this control rod?

A. The scram time will be **LONGER**.

B. The scram time will be **SHORTER**.

C. The time to manually insert the control rod will be **LONGER**.

D. The time to manually withdraw the control rod will be **SHORTER**.

Question # Answer	27 A	Question Developer Initials/Date: NTP 2/24/09

Knowledge and Ability Reference Information						RO	SRO
201003 Control Rod and Drive Mechanism K1.02 - Knowledge of the physical connections and/or cause- effect relationships between CONTROL ROD AND DRIVE MECHANISM and the following: Reactor water					Importance Rating	2.9	3.0
Level	**RO**	**Tier #**	**2**	**Group #**	**2**		
References		USAR 3.9.4.1.2					

Explanation:

Under normal circumstances, the fully charged accumulator provides the initial pressure to insert the control rod, but as the rod moves in, accumulator pressure lowers until the ball check valve repositions to allow higher RPV pressure to continue the rod movement (accumulator pressure falls below RPV pressure). USAR 3.9.4.1.2 provides the following:

Each drive requires about 2.5 gallons of water during the scram stroke. There is adequate water capacity in each drive's accumulator to complete a scram in the required time at low reactor pressures. At higher reactor pressures, the accumulator is assisted by reactor pressure reaching the drive through the ball check valve. As water is drawn from the accumulator, the accumulator discharge pressure falls below reactor pressure. This causes the check valve to shift its position to admit reactor pressure under the drive piston. Thus, reactor pressure furnishes the force needed to complete the scram stroke at higher reactor pressures, while the accumulator alone will accommodate the low pressure scrams. When the reactor is up to full operating pressure, the accumulator is actually not needed to meet scram time requirements. With the reactor at 1000 psig, the scram force is still over 1000 pounds without an accumulator. Thus, if the ball check valve never allows the higher RPV pressure to insert the scrammed control rod as accumulator pressure decays, it will take longer to scram the control rod. This slowed time could be seen by the Operator at the panels watching the control rods insert. Answer A is correct and answer B is incorrect.

Answer C & D are correct. The ball check valve has no impact on the ability to manually drive the rod in/out.

References to be provided during exam:	None	

Learning Objective	2621.828.0.0011 LO 00078 State/identify the purpose of the following major components of a Control Rod Drive Mechanism, including the ball check valve					
Question Source	**Bank**	X	**Modified Bank**		**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:PEO
10 CFR Part 55 Content:	**55.41**	7	**55.43**			
Time to Complete: 1-2 minutes						

Question 28 **1 Point**

Which of the following states the power supplies to the MSIV solenoids?

	AC Power Supply	DC Power Supply
A.	PSP 1 **OR** PSP 2	DF-D **OR** DC-F
B.	CIP-3	DC-1 **OR** DC-2
C.	CIP-3	DF-D **OR** DC-F
D.	MCC 1AB2	DC-1 **OR** DC-2

Question # Answer	28 C	Question Developer Initials/Date: NTP 2/24/09

Knowledge and Ability Reference Information						RO	SRO
239001 Main and Reheat Steam K2.01 - Knowledge of electrical power supplies to the following: Main steam isolation valve solenoids					Importance Rating	3.2	3.3
Level	RO	**Tier #**	2	**Group #**	2		
References		301.1		237E566 sh 12/14			
Explanation:	The MSIV solenoid sets (1 set per MSIV) are each powered from a DC and an AC power supply. The AC supply for all AC solenoids is from CIP-3. The DC solenoids are either powered from DC-D or DC-F. Answer C is correct. All other answers are incorrect but plausible if the candidate did not know the correct power supply. The AC supplies listed are vital or essential power supplies and the DC supplies are all safety related supplies.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0030 LO 03956 List the signals which initiate automatic closure of the MSIVs and the setpoints of these signals.						
Question Source	**Bank**		**Modified Bank**	X	**New**		
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:F	**Comprehension or Analysis**			
10 CFR Part 55 Content:	**55.41**	7	**55.43**				
Time to Complete: 1-2 minutes							

Question 29 **1 Point**

The plant is at rated power with the following Reactor Building HVAC lined-up as **shown on the following page**.

The following annunciators then alarmed:

- FDR TO 460V 1B2 TRIP
- 1B2 MN BRKR TRIP

With **NO** Operator action, which of the following states the impact on Reactor Building ΔP?

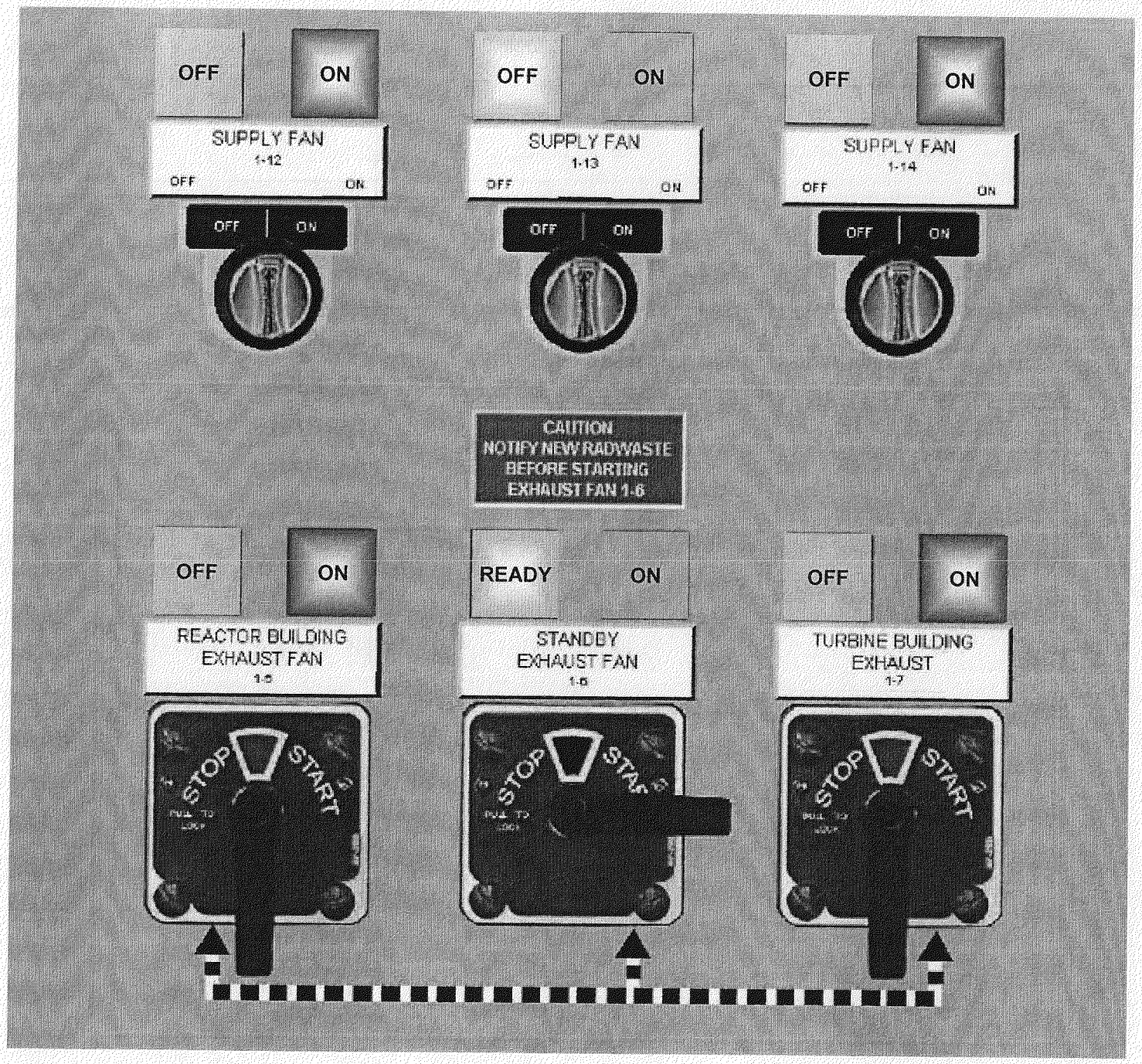
Reactor Building ΔP will ….

A. **NOT** be impacted.

B. go **MORE** negative.

C. go **LESS** negative.

D. go from negative to positive.


OFF
ON
SUPPLY FAN
1-12
OFF
ON
OFF
ON
SUPPLY FAN
1-13
OFF
ON
OFF
ON
SUPPLY FAN
1-14
OFF
ON
CAUTION
NOTIFY NEW RADWASTE
BEFORE STARTING
EXHAUST FAN 1-6
OFF
ON
REACTOR BUILDING
EXHAUST FAN
1-5
READY
ON
STANDBY
EXHAUST FAN
1-6
OFF
ON
TURBINE BUILDING
EXHAUST
1-7
STOP
START
STOP
START
STOP
START

Question # Answer	29 B	Question Developer Initials/Date: NTP 2/24/09

Knowledge and Ability Reference Information						RO	SRO
288000 Plant Ventilation K3.05 - Knowledge of the effect that a loss or malfunction of the PLANT VENTILATION SYSTEMS will have on following: Reactor building pressure					Importance Rating	3.1	3.3
Level	RO	**Tier #**	2	**Group #**	2		
References	329						
Explanation:	As shown, 2 RB supply fans and 1 RB exhaust fan are in service. In the normal configuration, RB ΔP is negative. The provided annunciator describes the loss of USS 1B2. The fan power supplied are as follows: SF 1-12 1A21 (remains energized); SF 1-14 1B23 (fed from USS 1B2 and is de-energized); EF 1-5 1A2 (remains energized). Therefore, one supply fan is de-energized. With less supply air, the RB ΔP, which is already negative, will get more negative. Answer B is correct.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0042 LO 261-10439 Given the system logic/electrical drawings, describe the system auto initiation signals, setpoints, and expected system response including power loss or failed components.						

Question Source	Bank		Modified Bank		New	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**		**Comprehension or Analysis**	X 3:PEO		
10 CFR Part 55 Content:	**55.41**	5	**55.43**			
Time to Complete: 1-2 minutes						

Question 30 **1 Point**

The plant is shutdown and cooling down with the Turbine Bypass Valves as **shown on the following page**. Present plant conditions are as follows:

- RPV pressure is 700 psig and lowering slowly
- RPV cooldown rate is 40 °F/hr

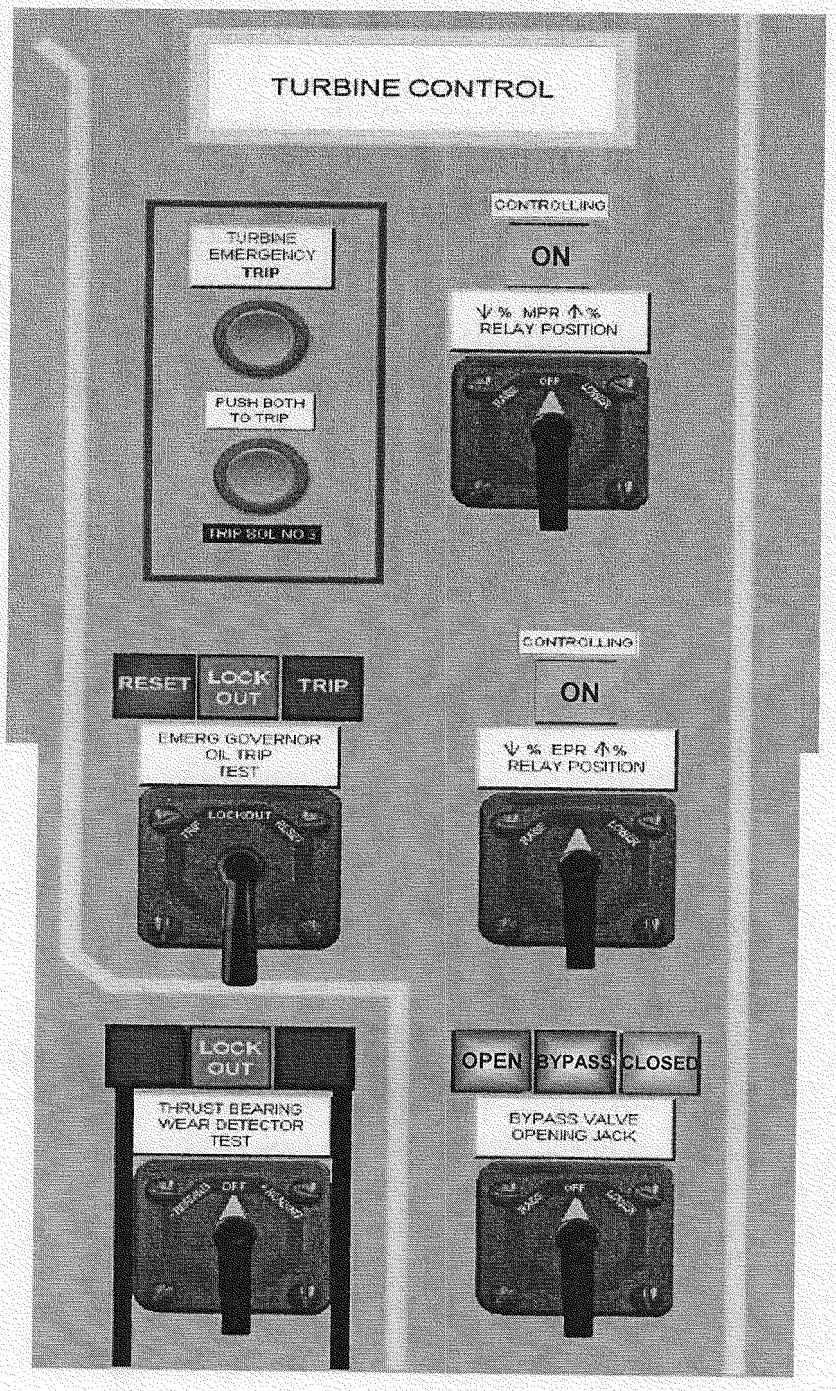
Which of the following states how the RPV cooldown rate can be **RAISED**?

A. Place the EPR RELAY POSITION switch to the ↑% position.

B. Place the MPR RELAY POSITION switch to the ↓% position.

C. Place the BYPASS VALVE OPENING JACK switch to the **RAISE** position.

D. Place the BYPASS VALVE OPENING JACK switch to the **LOWER** position.


TURBINE CONTROL
TURBINE EMERGENCY TRIP
PUSH BOTH TO TRIP
TRIP SOL NO 3
CONTROLLING
ON
↓% MPR ↑%
RELAY POSITION
RAISE
OFF
LOWER
RESET
LOCK OUT
TRIP
EMERG GOVERNOR OIL TRIP TEST
TRIP
LOCKOUT
RESET
CONTROLLING
ON
↓% EPR ↑%
RELAY POSITION
RAISE
LOWER
LOCK OUT
THRUST BEARING WEAR DETECTOR TEST
OPEN
BYPASS
CLOSED
BYPASS VALVE OPENING JACK
RAISE
OFF
LOWER

Question # Answer	30 C	Question Developer Initials/Date: NTP 2/24/09

Knowledge and Ability Reference Information						RO	SRO
241000 Reactor/Turbine Pressure Regulator K4.16 - Knowledge of REACTOR/TURBINE PRESSURE REGULATING SYSTEM design feature(s) and/or interlocks which provide for the following: Reactor cooldown					Importance Rating	3.3	3.4
Level	RO	**Tier #**	2	**Group #**	2		
References		318		Simulator			
Explanation:	To raise the cooldown rate, the turbine bypass valves need to be opened further. It can be seen by the drawing provided that neither the MPR or the EPR is in control and that the turbine bypass valves are controlled by the bypass valve opening jack. To open the bypass valves further, the operator will take the bypass opening jack to the RAISE position. Answer C is correct and answer D is incorrect. At this reactor pressure, the EPR has no control (outside of its range). Answer A is incorrect. The MPR setpoint could be used to control pressure and thus cooldown, but the action in answer B will act to close the bypass valves and lower the cooldown rate. Answer B is incorrect.							
References to be provided during exam:	None						
Learning Objective	2621.828.0.0051 LO 249-10446 Identify and explain system operating controls/indications under all plant operating conditions.						

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 2:RI
10 CFR Part 55 Content:	**55.41**	**7**	**55.43**			
Time to Complete: 1-2 minutes						

Question 31 **1 Point**

The plant is shutdown for a refuel outage and you are working on a manpower schedule of Operators. Present plant conditions are as follows:

- The current Fuel Pool heat load is 0.5×10^6 BTU/hr
- Each spent fuel bundle represents a 0.5×10^4 BTU/hr heat load
- 40 spent fuel bundles will be removed from the RPV each shift

If the Augmented Fuel Pool Cooling System is to be placed into service **BEFORE** the Fuel Pool heat load reaches 1.0×10^6 BTU/hr, when is the **LATEST** that you should schedule the manpower to place the Augmented Fuel Pool Cooling System into service?

Place the Augmented Fuel Pool Cooling System into service **AFTER** the ....

A. first shift.

B. second shift.

C. third shift.

D. fourth shift.

Question # Answer	31 B	Question Developer Initials/Date: NTP 2/24/09

Knowledge and Ability Reference Information						RO	SRO
233000 Fuel Pool Cooling/Cleanup K5.03 - Knowledge of the operational implications of the following concepts as they apply to FUEL POOL COOLING AND CLEAN-UP : Spent fuel decay heat generation					Importance Rating	2.6	2.8
Level	RO	**Tier #**	2	**Group #**	2		
References							
Explanation:	Oyster Creek utilizes both a fuel pool cooling system and an augmented fuel pool cooling system that can be used during high heat loads, such as refueling operations. After the first shift, 200,000 BTU/hr heat load is added to the fuel pool (40 x 5000 = 200,000). Total heat load after the first shift is 700,000 BTU/hr (500,000 + 200,000 = 700,000). After the second shift, another 200,000 BTU/hr heat load is added to the fuel pool, for a total heat load of 900,000 (700,000 + 200,000 = 900,000) BTU/hr. If another shift moves fuel, the total heat load will be 1,100,000 (900,000 + 200,000) BTU/hr, which is greater than allowed of 1,000,000. Therefore, without exceeding this limit, the augmented fuel pool cooling system shall be scheduled to be placed into service after the second shift. Answer B is correct. The other answers are incorrect but plausible if incorrect math is utilized.							
References to be provided during exam:	None						
Learning Objective							

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**	5	**55.43**			
Time to Complete: 1-2 minutes						

Question 32 **1 Point**

The plant was at 35% power during a startup when the following annunciator alarmed:

- H_2 SYSTEM TROUBLE

The TB EO reports that the Main Seal Oil Pump has tripped and that the Emergency Seal Oil Pump will **NOT** start.

Which of the following states the required action **AND** the generator HYDROGEN PRESS **PRIOR** to any Operator action? (Assume there are **NO** safety concerns)

	Required Action	HYDROGEN PRESS indication
A.	Trip the turbine	Lowering to 0 psig
B.	Scram the reactor	Lowering to a value > 0 psig
C.	Maintain the generator within the Capability Curve	Lowering to 0 psig
D.	Maintain the generator within the Capability Curve	Lowering to a value > 0 psig

Question # Answer	32 D	Question Developer Initials/Date: NTP 2/25/09

Knowledge and Ability Reference Information						RO	SRO
245000 Main Turbine Gen. / Aux. K6.04 - Knowledge of the effect that a loss or malfunction of the following will have on the MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS : Hydrogen cooling					Importance Rating	2.6	2.7
Level	RO	**Tier #**	2	**Group #**	2		
References	336.1 336.3		865D741		RAP-R6b 336.2		
Explanation:	The plant is at 35% power when a loss of both the normal and emergency seal oil pumps occurs. When this occurs, bearing oil will supply seal oil at a reduced pressure. There is no procedural requirement to either scram or trip the turbine under these conditions (unless another different parameter is unsat). The 336.1 procedure does require that the generator be maintained within the generator capability curve, which is a function of generator hydrogen gas pressure (which goes down to 0.5 psig hydrogen pressure). As the seal oil pressure lowers to that provided by bearing oil, hydrogen gas will leak out of the generator until the pressure is just below the seal oil pressure provided by bearing oil. Therefore, the generator must be operated within the capability curve and hydrogen pressure indication will lower to just below the seal oil pressure supplied by bearing pressure.							
References to be provided during exam:	None						
Learning Objective	2621.828.0.0050 LO 245-10445 Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.						

Question Source	**Bank**		**Modified Bank**	**X**	**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		**X** **3:SPK**
10 CFR Part 55 Content:	**55.41**	**7**	**55.43**			
Time to Complete: 1-2 minutes						

Question 33 **1 Point**

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

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

The following annunciator then alarms:

- LKOUT RELAY 86/S1B TRIP

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

	Containment Spray/ESW B	Containment Spray/ESW D
A.	• Both pumps trip • Both pumps can be immediately restarted	• Both pumps remain running
B.	• Both pumps remain running	• Both pumps trip • Containment Spray Pump can be restarted after 200 seconds • ESW Pump can **NOT** be restarted
C.	• Both pumps trip • Containment Spray Pump can be restarted after 200 seconds • ESW Pump can **NOT** be restarted	• Both pumps trip • Both pumps can be immediately restarted
D.	• Both pumps remain running	• Both pumps trip • Both pumps can be restarted after 200 seconds

Question # Answer	33 D	Question Developer Initials/Date: NTP 2/25/09

Knowledge and Ability Reference Information		RO	SRO
219000 RHR/LPCI: Torus/Pool Cooling Mode A1.07 - Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE controls including: Emergency generator loading	**Importance Rating**	3.2	3.3

Level	RO	Tier #	2	Group #	2

References	341	RAP-S1c	237E901

Explanation:

The plant was at rated power when an event occurred resulting in a high Drywell pressure condition. B Containment Spray Loop is in the Drywell Spray mode, and D Containment Spray Loop is in the Torus cooling mode. The annunciator provided shows that startup transformer S1B has tripped. It had been supplying 4160 Bus 1B, and Bus 1D (and Bus 1B2). When the transformer trips, Bus 1B becomes de-energized and EDG 2 starts and loads onto Bus 1D. Thus, Bus 1B is de-energized and EDG 2 is supplying Bus 1D (and Bus 1B2).

Loop B pumps are powered from 4160 Bus 1C (ESW pump) and Bus 1A2 (from Bus 1C for the Containment Spray pump). Both these busses are still powered from startup transformer S1A and are unaffected by the loss of the other startup transformer. Therefore, the Loop B pumps remain running.

Loop D pumps are powered from 4160 Bus 1D (ESW pump) and Bus 1B2 (from Bus 1D for the Containment Spray pump). Both these busses were initially powered from startup transformer S1B, which has been lost. Since Bus 1D has been re-powered by the EDG, ESW Pump D has power. EDG 2 immediately started and loaded onto Bus 1D. But, to prevent EDG loading concerns, the manual start of any containment spray pump and ESW pump on Bus 1D is prevented for 200 seconds after the EDG picks up the bus.

Therefore: Loop B pumps remain running, Loop D ESW Pump trips and can be re-started in 200 seconds, and containment spray pump D trips and can be manually restarted after 200 seconds. Answer D is correct.

The other answers are incorrect but plausible if the candidate does not know the meaning of the provided alarm, electrical distribution or the associated logic.

References to be provided during exam:	None					
Learning Objective	2621.828.0.0009 LO 226-10446 Identify and explain system operating controls/indications under all plant operating conditions.					
Question Source	**Bank**		**Modified Bank**	X	**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 2:RI
10 CFR Part 55 Content:	**55.41**	**5**	**55.43**			
Time to Complete: 1-2 minutes						

Question 34 **1 Point**

The plant was at rated power when the following events occurred:

- The AIRFAIL light above E MG SET SPEED CONTROLLER energized
- Annunciator FCS/RFCS TROUBLE alarmed

While investigating the alarms, the Operator inadvertently rotated the MASTER RECIRC SPEED CONTROLLER knob in the CCW direction from 47 Hz to 45 Hz.

Which of the following states the impact of this controller manipulation on the Recirculation Pumps **AND** what other action is required?

	Impact	**Required Action**
A.	**ALL** Recirculation Pumps are at the new **LOWER** speed	Verify position on the Power Operations Curve
B.	**ALL** Recirculation Pumps remain at the **INITIAL** speed	Lower Recirculation Pumps speeds with the Moore Controllers
C.	Recirculation Pumps A, B, C, & D are at the new **LOWER** speed; Pump E is at the **INITIAL** speed	Lower Recirculation Pump E speed locally at the MG Set to match the other Pumps
D.	Recirculation Pumps A, B, C, & D are at the new **LOWER** speed; Pump E is at the **INITIAL** speed	Lower Recirculation Pump E speed with its Moore Controller to match the other Pumps

Question # Answer	34 C	Question Developer Initials/Date: NTP 2/25/09

Knowledge and Ability Reference Information		RO	SRO
202002 Recirculation Flow Control System A2.05 - Ability to (a) predict the impacts of the following on the RECIRCULATION FLOW CONTROL SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Scoop tube lockup BWR-2, 3, 4	**Importance Rating**	3.1	3.1

Level	RO	Tier #	2	Group #	2

References	301.2	RAP-J	

Explanation:	The indication shows a loss of air to control recirculation MG set E. As a result, the scoop tube will lock up. When the master recirculation speed controller is taken CCW (reduction in speed), all other MG sets will follow and will result in lower speeds. Because speed control has been lost and the scoop tube is locked for recirculation pump E, its speed is the same as before the speed change. To control MG E, it is necessary to manually control the speed locally at the scoop tube. Answer C is correct. All other answers are incorrect but plausible if the candidate does not know the meaning of the air fail or the various methods to control the recirculation pump.

References to be provided during exam:	None	

Learning Objective	2621.828.0.0040 LO 00214 Explain what causes a scoop tube lockup and mechanically what occurs, including how to reset.

Question Source	Bank		Modified Bank	X	New	
Question Cognitive Level:	Memory or Fundamental Knowledge			Comprehension or Analysis		X 3:SPK
10 CFR Part 55 Content:	55.41	5	55.43			
Time to Complete: 1-2 minutes						

Question 35 **1 Point**

The plant was starting up after a refuel outage and power is stable and critical on the SRMs. Control rod withdrawals have been suspended temporarily.

The following annunciator then alarmed:

- ROD DRIFT

The Operator notes that SRM PERIOD CHANNEL 21 meter indicator is moving upwards.

Which of the following states the expected indication for this event on the full core display?

One control rod position indication shows ....

A. the number getting larger.

B. the number getting smaller.

C. an XX with a black backlight.

D. a red backlight with **NO** number.

Question # Answer	35 A	Question Developer Initials/Date: NTP 2/26/09

Knowledge and Ability Reference Information						RO	SRO
214000 RPIS A3.01 - Ability to monitor automatic operations of the ROD POSITION INFORMATION SYSTEM including: Full core display					Importance Rating	3.4	3.3
Level	**RO**	**Tier #**	**1**	**Group #**	**1**		
References	ABN-6						
Explanation:	The plant is critical and stable on the SRMs when indications of a control rod drifting outward (period getting smaller or faster as the meter indication rises) occurs. The expected indications show a control rod whose position is getting numerically larger. As the control rod moves out, the rod position is automatically updated on the full core display. Answer A is correct. In answer B, the control rod would be moving inward. Answer C shows a loss of control rod position and is incorrect. Answer D shows an uncoupled control rod and is incorrect.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0036 LO 00726 Given a mode and direction for control rod movement, describe response of the timer, response of the CRD System, system indications and operation of controls.						
Question Source	**Bank**		**Modified Bank**	X	**New**		
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**	X 2:RI		
10 CFR Part 55 Content:	**55.41**	7	**55.43**				
Time to Complete: 1-2 minutes							

Question 36 **1 Point**

The plant was at rated power when an overwhelming smell of chlorine was noticed by several Control Room Operators.

Which of the following states how and why the Control Room HVAC System should be aligned, IAW procedure 331.1, Control Room and Old Cable Spreading Room Heating, Ventilation and Air Conditioning System?

A. Manually trip and isolate the System to minimize air intrusion into the Control Room.

B. Run System B in the **PURGE** Mode, to remove chlorine smells from the Control Room.

C. Run System A in the **PART RECIRC** Mode to maintain a positive pressure in the Control Room.

D. Run System B in the **FULL RECIRC** Mode to minimize the use of outside air into the Control Room.

Question # Answer	36 D	Question Developer Initials/Date: NTP 2/26/09

Knowledge and Ability Reference Information						RO	SRO
290003 Control Room HVAC A4.04 - Ability to manually operate and/or monitor in the control room: Environmental conditions					Importance Rating	2.8	3.0
Level	RO	**Tier #**	2	**Group #**	2		
References		331.1		ABN-33			

Explanation:	The environmental conditions had changed as noticed by the Operators in the control room. Placing the CR HVAC system into the proper mode assures the highest quality environmental conditions for the given conditions. Procedure 331.1 defines full recirculation mode as a mode of operation to minimize the intrusion of toxic gases into the control room during a release using no outside air. For a chlorine gas leak, the procedure directs you to ABN-33. ABN-33 directs placing the CR HVAC system in the full recirculation mode. Answer D is correct. Both hypochlorite and chlorine gas are stored on site and their release could result in a chlorine intrusion into the control room. All other answers are plausible but incorrect since they are actions that could be performed but are not appropriate for the given conditions, or the reason is incorrect.
References to be provided during exam:	None
Learning Objective	2621.828.0.0054 LO 02324 Explain the basis, with use of the procedure, for the four different modes of control room ventilation damper alignment and the effects of the damper alignment modes on control room habitability.

Question Source	**Bank**		**Modified Bank**	X	**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:P	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**	**7**	**55.43**			
Time to Complete: 1-2 minutes						

Question 37 **1 Point**

The plant was at 98% power when the Operator noted small oscillations in reactor power. These observations included the following:

- APRMs are oscillating between 97% and 99% power
- Generator electric is oscillating between 630 and 645 MWe
- Recirculation Pump C MG SET SPEED CONTROLLER is oscillating between 46 and 48.5 Hz.

Which of the following states the correct action IAW the applicable ABN?

A. Take local manual control of Recirculation Pump C.

B. Trip Recirculation Pump C and close the discharge valve.

C. Place Recirculation Pump C MG SET SPEED CONTROLLER in MAN.

D. Lower the MASTER RECIRC SPEED CONTROLLER to provide margin to 100% power.

Question # Answer	37 C	Question Developer Initials/Date: NTP 2/26/09

Knowledge and Ability Reference Information						RO	SRO
202001 Recirculation 2.4.4 Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.					Importance Rating	4.5	4.7
Level	RO	**Tier #**	2	**Group #**	2		
References	ABN-2						
Explanation:	An oscillating recirculation pump controller will result in an entry into ABN-2. With only a single pump oscillating, the procedure directs the affected pump controller taken from AUTO to MAN (manual). Answer C is correct. If placing the controller in manual does regain control of the recirculation pump, the pump can then be placed in local manual control. If control is not regained and the oscillations either reach 5% peak-peak on APRMs, or generator output is oscillating by 30 MWe, then tripping the oscillating recirculation pump is directed. Lowering reactor power to prevent exceeding 100% may be a conservative decision but it is not directed in procedure. The distractors are plausible but incorrect. The actions listed are appropriate actions for other conditions involving recirculation pumps, just not for those listed.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0040 LO 00226 Identify and interpret for plant emergency/off normal situations which involve the Recirculation System, including personnel and equipment allocation.						

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:P	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**	10	**55.43**			
Time to Complete: 1-2 minutes						

Question 38 **1 Point**

Which of the following power supply losses will result in the **INABILITY** to detect fires at the Control Room Master Fire Alarm Panels A and B?

The loss of ....

A. PSP 1

B. PSP 2

C. USS 1B1

D. USS 1B2

Question # Answer	38 D	Question Developer Initials/Date: NTP 2/27/09

Knowledge and Ability Reference Information						RO	SRO
286000 Fire Protection K2.03 - Knowledge of electrical power supplies to the following: Fire detection system					Importance Rating	2.5	2.7
Level	RO	**Tier #**	2	**Group #**	2		
References	ABN-48						
Explanation:	IAW the reference, a loss of USS 1B2 will result in the loss of power to the Control Room Master Fire Alarm Panels A and B. Answer D is correct. All other answers are incorrect but plausible.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0019 LO 286-10446 Identify and explain system operating controls/indications under all plant operating conditions.						

Question Source	Bank		Modified Bank		New	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:F	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**	7	**55.43**			
Time to Complete: 1-2 minutes						

Question 39 **1 Point**

The plant was at rated power when a LOCA occurred. Present plant conditions are as follows:

- RPV water level indicates 100" on the NR GEMACs
- RPV water level indicates 96" on YARWAYs
- RPV pressure is 600 psig and lowering slowly
- Drywell temperature indicates 280 °F
- Torus water level indicates 156"
- Torus pressure indicates 15 psig

Which of the following is correct under the present plant conditions?

A. The EMRVs **CAN** function if required since their environmental qualification is **NOT** currently exceeded.

B. Drywell Sprays **CAN** be initiated because the parameters are on the good side the Torus Load Limit (TLL) Curve.

C. The YARWAYs are unreliable and should **NOT** be used to determine RPV water level due to exceeding saturation conditions.

D. The NR GEMACs are unreliable and should **NOT** be used to determine RPV water level due to being below the allowable Minimum Indicated Level.

Question # Answer	39 A	Question Developer Initials/Date: NTP 2/27/09

Knowledge and Ability Reference Information						RO	SRO
295028 High Drywell Temperature EK1.02 - Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL TEMPERATURE : Equipment environmental qualification					Importance Rating	2.9	3.1
Level	RO	**Tier #**	1	**Group #**	1		
References		EOP Bases		EMG-SP28			
Explanation:	The plant was at power when a LOCA occurred. IAW the EOP Bases, 281 °F DW temperature represents the DW design temperature. The EQ temperature for safety related equipment is slightly above this temperature. Therefore, at this temperature of 280 °F, the EMRVs will work if needed. Answer A is correct. Answer B is incorrect. The Containment Spray Initiation Limit curve bases provides why Drywell Sprays cannot be initiated at certain times. Drywell Sprays can be initiated when on the good side of the curve (under the limit). The Torus Load Limit Curve bases is not related to the initiation or prevention of initiation of Drywell Sprays. IAW SP-28, the conditions provided place both the NR GEMACs and YARWAYs on the good region of the individual curves (saturation curve and the minimum indicated water level curves) and both can be used to determine RPV water level. Answers C and D are incorrect.						
References to be provided during exam:		EMG-SP28					
Learning Objective	2621.845.0.0056 LO 3000 Using procedure EMG-3200.02, evaluate the technical basis for each step in the procedure, and apply this evaluation to determine correct courses of action under emergency conditions.						

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:B	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**	10	**55.43**			
Time to Complete: 1-2 minutes						

Question 40 **1 Point**

Which of the following will ensure that the Standby Gas Treatment System is available to protect the health and safety of the general public by minimizing an offsite gaseous radioactive release?

A. Maintaining the charcoal filters dry.

B. Maintaining absolute filter efficiency at a minimum of 80%.

C. Maintaining the Reactor Building at a slight positive pressure.

D. Verifying automatic system initiation on high Drywell pressure (≤ 3 psig) and RPV low water level (138").

Question # Answer	40 A	Question Developer Initials/Date: NTP 2/27/09

Knowledge and Ability Reference Information						RO	SRO
295038 High Off-site Release Rate EK1.02 - Knowledge of the operational implications of the following concepts as they apply to HIGH OFF-SITE RELEASE RATE : Protection of the general public					Importance Rating	4.2	4.4
Level	**RO**	**Tier #**	**1**	**Group #**	**1**		
References		USAR 6.5.1		TS 4.5.H			
Explanation:	IAW the USAR reference, an electric heater Is installed to control the exhaust gas temperature, and thus humidity. For optimum operation, the humidity is maintained below 70%. With no heating and 100% humidity, the radioiodine removal efficiency falls to 78%. Answer A is correct. IAW the TS reference, the SGT is tested to ensure an absolute filter efficiency of ≥99%. Answer B is incorrect. With either the normal RB HVAC or SGT in service, RB pressure is always operated at a slight negative pressure. Answer C is incorrect. Testing is performed to demonstrate that SGT initiates as designed: high DW pressure, or RPV low-low water level – not at the low water level point. Answer D is incorrect.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0042 LO 261-10435 Given plant operating conditions, describe or explain the purpose/function of the system and its components.						

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:F	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**	10	**55.43**			
Time to Complete: 1-2 minutes						

Question 41 **1 Point**

The plant was at rated power when an inadvertent MSIV isolation occurred. The Operator reports that RPV pressure peaked at 1120 psig, and now indicates 950 psig and lowering.

Which of the following is correct regarding the Safety Valve and EMRV indications in the Control Room?

A. **ONLY** 4 of the Safety Valves showed in the VALVE OPEN REGION during the transient

B. **BOTH** combined EMRV tailpipe temperature indicators indicate a steady, constant elevated temperature

C. **BOTH** combined EMRV tailpipes temperature indicators indicate an elevated temperature and are lowering slowly

D. **ONLY** the combined EMRV tailpipe temperature indicator for NR108A, NR108B and NR108E indicate an elevated temperature and is lowering slowly

Question # Answer	41 C	Question Developer Initials/Date: NTP 2/27/09

Knowledge and Ability Reference Information						RO	SRO
295025 High Reactor Pressure EK1.03 - Knowledge of the operational implications of the following concepts as they apply to HIGH REACTOR PRESSURE : Safety/relief valve tailpipe temperature/pressure relationships					Importance Rating	3.6	3.8
Level	RO	**Tier #**	1	**Group #**	1		
References		420		RAP-B46		TS 2.3.B	

Explanation:

The plant was at rated power when all MSIVs went closed, and resulted in RPV pressure peaking at 1120 psig, and is not 950 psig and lowering. At 1120 psig, all EMRVs will have opened (highest EMRV pressure setpoint to open is 1085 psig), and NO safety valves will have opened (lowest safety valve pressure setpoint to open is 1212 psig). At 950 psig, all EMRVS will have closed (lowest EMRV pressure setpoint to close is 1019 psig). Therefore, all EMRVs have opened and closed. The temperature indications in the control room for EMRV tailpipe temperatures use one indicator for a common tailpipe for the A, B & E EMRVS, and a second for the C & D EMRVs. Thus, temperature indications for both indicators have risen since the all EMRVs opened, but will be lowering slowly since all EMRVs have closed. Answer C is correct.

Answer A is incorrect since no safety valves opened. It's plausible if the Candidate forgot the open setpoint for safety valves. Tech Specs requires that 4 SVs AT 2121 psig and 5 open at 1221 psig.

Answer B is incorrect since the EMRVs are closed. It's plausible if the Candidate forgot the open setpoint for closing or thought EMRVs were still open.

Answer C is incorrect since all EMRVs opened. It's plausible if the Candidate forgot the open setpoint for the EMRVs.

References to be provided during exam:	None	
Learning Objective	2621.828.0.0030 LO 01032 Analyze Technical Specification requirements when given applicable sections.	

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**	10	**55.43**			
Time to Complete: 1-2 minutes						

Question 42 **1 Point**

Which of the following indications are available on the Remote Shutdown Panel?

A. RPV water level (YARWAY) and reactor power

B. RPV water level (GEMAC) and RPV pressure

C. RPV water level (FUEL ZONE) and RPV pressure

D. RPV water level (FUEL ZONE) and Isolation Condenser A shell water level

Question # Answer	42 C	Question Developer Initials/Date: NTP 2/27/09

Knowledge and Ability Reference Information						RO	SRO
295016 Control Room Abandonment AK2.01 - Knowledge of the interrelations between CONTROL ROOM ABANDONMENT and the following: Remote shutdown panel					Importance Rating	4.4	4.5
Level	**RO**	**Tier #**	**1**	**Group #**	**1**		
References		346					
Explanation:	The Remote Shutdown Panel has the following primary coolant indications: RPV water level (fuel zone), RPV pressure, and Isolation Condenser B shell water level. Answer C is correct. Other distractors are incorrect but plausible if the candidate confuses what indications are available on the panel.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0064 LO 308-10446 Identify and explain system operating controls/indications under all plant operating conditions.						
Question Source	**Bank**		**Modified Bank**	**X**	**New**		
Question Cognitive Level:	**Memory or Fundamental Knowledge**		**X** **1:F**	**Comprehension or Analysis**			
10 CFR Part 55 Content:	**55.41**	**7**	**55.43**				
Time to Complete: 1-2 minutes							

Question 43 **1 Point**

The plant was at rated power with the following 125 VDC battery chargers in-service:

- Battery Charger MG Set A
- A/B static Charger
- Static Charger C1

The following annunciator then alarmed:

- 1A2 MN BRKR TRIP

Which of the following states the impact on the DC Distribution System?

A. B Battery has lost its charger and shall be declared inoperable immediately.

B. C Battery has lost its charger and shall be declared inoperable immediately.

C. A Battery has lost its charger but it can be aligned to the Battery Charger MG B for charging.

D. C Battery has lost its charger but it can be aligned to the standby Static Charger C2 for charging.

Question # Answer	43 B	Question Developer Initials/Date: NTP 2/27/09

Knowledge and Ability Reference Information						RO	SRO
295004 Partial or Total Loss of DC Pwr AK2.01 - Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF D.C. POWER and the following: Battery charger					Importance Rating	3.1	3.1
Level	**RO**	**Tier #**	**1**	**Group #**	**1**		

References	ABN-45	338	3033 3028

Explanation:	The plant is at rated power with the following lineup: DC A is being charged by the Battery Charger MG Set A, DC B is being charged by the A/B static Charger, and DC C is being charged by Static Charger C1. The provided alarm shows a loss of power to USS 1A2, which feeds VMCC 1A2. VMCC 1A2 supplies the Static Chargers C1 & C2. Battery Charger MG Set A is supplied from VMCC 1B2 (through USS 1B2) and the A/B Static Charger is supplied by MCC 1B21 (from USS 1B2) and both are unaffected by the event. IAW ABN-45, C Battery is to be considered inoperable immediately with the loss of the charger. Answer B is correct. Answer A is incorrect since B Battery still has its charger. Answer C is incorrect since A Battery is not impacted. Answer D is incorrect since both the C1 and C2 static chargers have lost power.
References to be provided during exam:	None
Learning Objective	2621.828.0.0016 LO 262-10453 Explain or describe how this system is interrelated with other plant systems.

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**	**7**	**55.43**			
Time to Complete: 1-2 minutes						

Question 44 **1 Point**

The plant is shutdown with **ONLY** Shutdown Cooling in-service as the RPV cooling method. Present plant conditions are as follows:

- RPV water level is 160" and steady
- RECIRC PUMP SUCTION TEMPS indicates 347 °F
- Shutdown Cooling (SDC) Pump A is in service

Five minutes later, the Operator makes the following report:

- RPV pressure indicates 123 psig

Which of the following states the impact on the SDC System and the required action?

	Impact on SDC SDC Pump A tripped **AND**	**Required Action**
A.	SDC is isolated	Bypass the SDC isolation interlock and restart SDC Pumps
B.	SDC is isolated	Initiate alternate RPV cooling using the Isolation Condensers
C.	SDC is **NOT** isolated	Bypass any failed Recirculation Temperature interlock and restart the SDC Pumps
D.	SDC is **NOT** isolated	Initiate alternate RPV cooling using the RWCU System

Question # Answer	44 B	Question Developer Initials/Date: NTP 2/28/09

Knowledge and Ability Reference Information						RO	SRO
295021 Loss of Shutdown Cooling AK2.03 - Knowledge of the interrelations between LOSS OF SHUTDOWN COOLING and the following: RHR/shutdown cooling					Importance Rating	3.6	3.6
Level	RO	**Tier #**	1	**Group #**	1		
References		ABN-3		305	203		
Explanation:	The plant is shutdown with only SDC cooling the RPV. At 123 psig, RPV temperature equals 351.8 °F. At 350 °F, the SDC isolation valves close (isolating SDC) and all running SDC pumps trip. IAW ABN-3, an alternate cooling method is the use of the isolation condensers. Answer B is correct. Answers C and D are incorrect since the system has isolated, although the required actions are plausible. Answer A has the correct impact and bypassing the SDC isolation interlocks is allowed IAW procedure, but it is only allowed during an emergency. No emergency is stated or implied in the question stem. Answer A is incorrect.							
References to be provided during exam:	Attachment 201-7(saturation table)						
Learning Objective	2621.828.0.0045 LO 205-10444 Describe the interlock signals and setpoints for the affected system components and expected system response including power loss or failed components.						

Question Source	Bank		Modified Bank	X	New	
Question Cognitive Level:	Memory or Fundamental Knowledge			Comprehension or Analysis		X 3:SPK
10 CFR Part 55 Content:	55.41	7	55.43			
Time to Complete: 1-2 minutes						

Question 45 **1 Point**

Which of the following states the bases for the Containment Spray Initiation Limit Curve in the Primary Containment Control EOP?

A. A resultant excessive negative Primary Containment pressure could challenge Primary Containment integrity.

B. A resultant excessive negative Torus pressure could prevent operation of Torus vent valves, when needed.

C. A resultant excessive negative Torus pressure could exceed the load limit on the downcomers during an emergency depressurization.

D. A resultant excessive negative Primary Containment pressure could prevent operation of Torus to Drywell Vacuum Breakers, when needed.

Question # Answer	45 A	Question Developer Initials/Date: NTP 2/28/09

Knowledge and Ability Reference Information						RO	SRO
295024 High Drywell Pressure EK3.01 - Knowledge of the reasons for the following responses as they apply to HIGH DRYWELL PRESSURE : Drywell spray operation					Importance Rating	3.6	4.0
Level	RO	**Tier #**	1	**Group #**	1		
References	EOP Bases						
Explanation:	IAW the reference, the initiation of drywell sprays will result in a large drop in primary containment pressure due to evaporative cooling. This drop in pressure can occur faster than can be compensated for by the vacuum relief system, and could result in a negative primary containment pressure which can challenge primary containment integrity. Answer A is correct. All other answers are incorrect but plausible if the candidate did not know the EOP basis. Operation of the vent valves could be prevented on a high primary containment water level or confused with the primary containment pressure limit. The rapid depressurization due to the evaporative cooling could be in excess of the protection allowed by the vacuum breakers, but will not prevent their operation. The failure of the downcomers is related to the torus load limit bases.						
References to be provided during exam:	None						
Learning Objective	2621.845.0.0056 LO 3000 Using procedure EMG-3200.02, evaluate the technical basis for each step in the procedure, and apply this evaluation to determine correct courses of action under emergency conditions.						

Question Source	Bank		Modified Bank		New	X
Question Cognitive Level:	Memory or Fundamental Knowledge		X 1:B	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41	5	55.43			
Time to Complete: 1-2 minutes						

Question 46 **1 Point**

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

Answer the following questions as they relate to the Isolation Condenser System, under the conditions above?

1. Can the Isolation Condenser System be manually initiated from the Control Room?
2. Can makeup water be provided to the Isolation Condenser shells?

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

Question # Answer	46 B	Question Developer Initials/Date:

Knowledge and Ability Reference Information						RO	SRO
295003 Partial or Complete Loss of AC AK3.07 - Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER: Initiation of isolation condensers				Importance Rating		3.8	4.0
Level	RO	**Tier #**	1	**Group #**	1		
References		ABN-35		ABN-37		307	
Explanation:	The plant was at power when a station blackout occurred. There is no AC power in the station. In the normal configuration, the steam admission valves to each IC are open, one condensate return valve is open, and the second condensate return valve is closed. The closed valve is DC powered and can be manipulated with a loss of AC power. Filling of the shells usually requires AC power to a water pump. With AC gone, these AC powered pumps are lost. But the shells can also be filled by the Fire Protection water system, which under the given conditions, will be pressurized by diesel driven fire pumps. The makeup valves are air operated, with air accumulators, and fail closed on loss of air. Even if the accumulators discharged, they can be manually manipulated in the plant locally. Therefore, the isolation condensers can be initiated in the control room and the shells can be filled from fire protection with the total loss of AC power. Answer B is correct. If the candidates forget about the use of fire protection water supplied by the fire diesels or power supplies to the system valves and the normal standby lineup, then the other answers are plausible.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0023 LO 02338 Given plant conditions, evaluate the impact on the Isolation Condenser System and the plant.						

Question Source	**Bank**		**Modified Bank**		**New**	**X**
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		**X** **3:SPK**
10 CFR Part 55 Content:	**55.41**	**5**	**55.43**			
Time to Complete: 1-2 minutes						

Question 47 **1 Point**

The plant was at rated power when a sudden and catastrophic loss of instrument air occurred.

Which of the following states the failure mode for the Isolation Condenser Makeup Valves and the reason for the permanently installed Alternate Air supply to the valve accumulators? (assume the accumulators are currently discharged)

	Makeup Valve Failure Mode	Reason for Alternate Air Supply
A.	Closed	Allows controlling the valve to maximize the availability of the Isolation Condensers as a heat sink
B.	Closed	Allows opening to flood the shells in the event of a tube leak to minimize the radiation release
C.	Open	Allows closing the valve to prevent flooding the shells
D.	Open	Allows closing the valve to prevent draining the CSTs

Question # Answer	47 A	Question Developer Initials/Date: NTP 2/28/09

Knowledge and Ability Reference Information						RO	SRO
295019 Partial or Total Loss of Inst. Air AK3.01 - Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR : Backup air system supply					Importance Rating	3.3	3.4
Level	RO	**Tier #**	1	**Group #**	1		
References		307		ABN-35		USAR 6.3.1.1	
Explanation:	The isolation condenser makeup valves fail close on loss of air (with the accumulators discharged). The installed air supply allows opening the valves to allow the system to perform its function – to control RPV pressure in the event of a loss of the main heat sink. Answer A is correct. Answer B has the correct failure mode but there is no procedural guidance to flood the IC shells in the event of a tube break, even though doing so might minimize the radiation release. Answer B is incorrect. Answers C & D are incorrect since they list the incorrect failure mode, although the impacts listed are correct.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0023 LO 02338 Given plant conditions, evaluate the impact on the Isolation Condenser System and the plant.						

Question Source	Bank		Modified Bank		New	X
Question Cognitive Level:	Memory or Fundamental Knowledge		X 1:B	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41	5	55.43			
Time to Complete: 1-2 minutes						

Question 48 **1 Point**

The plant was in hot shutdown and was cooling down with the Shutdown Cooling System, when the following annunciator alarmed:

- RB CCW ISOL

The Operator reports the following observations:

- Valve V-5-147, CCW INLET ISOLATION, indicates **GREEN** light **ON**, **RED** light **OUT**
- Valve V-5-167, CCW OUTLET ISOLATION indicates **RED** light **ON** and **GREEN** light **OUT**

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

A. TORUS/DRYWELL – DW TEMP HI

B. MAIN STEAM – TRUNNION RM TEMP HI

C. RBCCW – CCW/SD CLG/FUEL POOL TEMP HI

D. CLEANUP SYSTEM – AUX PUMP CCW TEMP HI

Question # Answer	48 A	Question Developer Initials/Date: NTP 2/28/09

Knowledge and Ability Reference Information						RO	SRO
295018 Partial or Total Loss of CCW AA1.02 - Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER : System loads					Importance Rating	3.3	3.4
Level	**RO**	**Tier #**	**1**	**Group #**	**1**		
References		2006 sh. 1, 3		RAP-C2c			
Explanation:	The plant is in hot shutdown and cooling down with SDC. The annunciator and provided operator observation show that the RBCCW into the primary containment is isolated (the RBCCW inlet valve to the DW is closed). RBCCW provides cooling to the DW air coolers, and since cooling water to the Drywell is now lost, DW temperature will rise to the alarm point. Answer A is correct. All other answers are components cooled by RBCCW but are located outside the DW and thus still have RBCCW. Answers B, C, & D are incorrect.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0035 LO 00048 List possible causes, system response and affected RBCCW components for an auto isolation signal.						
Question Source	**Bank**	**X**	**Modified Bank**		**New**		
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**	**X** **3:PEO**		
10 CFR Part 55 Content:	**55.41**	**7**	**55.43**				
Time to Complete: 1-2 minutes							

Question 49 **1 Point**

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

- RPV water level is -60" and rising slowly
- The RPV has been depressurized by Emergency Depressurization
- Core Spray System 1 **AND** 2 are injecting into the RPV
- Containment Spray/ESW Pump 51A/52A are being used in the Drywell Spray mode
- Containment Spray/ESW Pump 51B/52B are being used in the Drywell Spray mode
- Drywell pressure is 4.9 psig and lowering
- Torus temperature is 100 °F and rising

The SRO has directed that you initiate Containment Spray Pump 51C in the Torus Cooling mode.

Which of the following actions are required to initiate Containment Spray Pump 51C in the Torus Cooling mode?

	First Action	Second Action
A.	Secure Containment Spray Loop A from Drywell Sprays	Initiate Containment Spray Loop C in Torus Cooling
B.	Initiate Containment Spray Loop C in Torus Cooling	Monitor for expected conditions
C.	Secure one Core Spray Loop	Initiate Containment Spray Loop C in Torus Cooling
D.	Initiate Containment Spray Loop C in Torus Cooling	Secure one Core Spray Loop

Question # Answer	49 A	Question Developer Initials/Date: NTP 2/28/09

Knowledge and Ability Reference Information						RO	SRO
295026 Suppression Pool High Water Temp EA1.01 - Ability to operate and/or monitor the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: Suppression pool cooling					Importance Rating	4.1	4.1
Level	RO	**Tier #**	1	**Group #**	1		
References		EMG-SP25		EMG-SP29			
Explanation:	The plant was at power when a LOCA occurred. With the RPV depressurized and RPV water level at -60", adequate core cooling is not assured. IAW EMG-SP25 (torus cooling), it states that if 4 containment spray/core spray main pumps are running, that an additional containment spray pump cannot be started. IAW EMG-SP29 (drywell spray), it provides the same direction. It also directs that DW pressure be maintained in the range of 4-12 psig, and to secure sprays before 4 psig is reached. Therefore, core sprays cannot be secured since adequate core cooling is not assured, another containment spray pump cannot be started under the given conditions, and a containment spray pump should be secured from spraying the DW. Securing one containment spray pump from DW sprays and initiating a containment spray pump for torus cooling is required. Answer A is correct. All other distractors are incorrect but plausible if the candidate does not know the 4 pump limitation or the definition for adequate core cooling.						
References to be provided during exam:	None						
Learning Objective	2621.845.0.0056 LO 3000 Using procedure EMG-3200.02, evaluate the technical basis for each step in the procedure, and apply this evaluation to determine correct courses of action under emergency conditions.						

Question Source	**Bank**	X	**Modified Bank**		**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 2:RI
10 CFR Part 55 Content:	**55.41**	7	**55.43**			
Time to Complete: 1-2 minutes						

Question 50 **1 Point**

The plant was shutdown for a refuel outage and fuel shuffling was in-progress. The beginning-of-shift SRM count rates are provided below:

- SRM 21 75 CPS
- SRM 22 70 CPS
- SRM 23 80 CPS
- SRM 24 55 CPS

The SRM count rates midway through the shift are provided below:

- SRM 21 575 CPS
- SRM 22 540 CPS
- SRM 23 580 CPS
- SRM 24 520 CPS

In which core quadrant, if any, does the count rate require entry into ABN-7, Unexplained Reactivity Change?

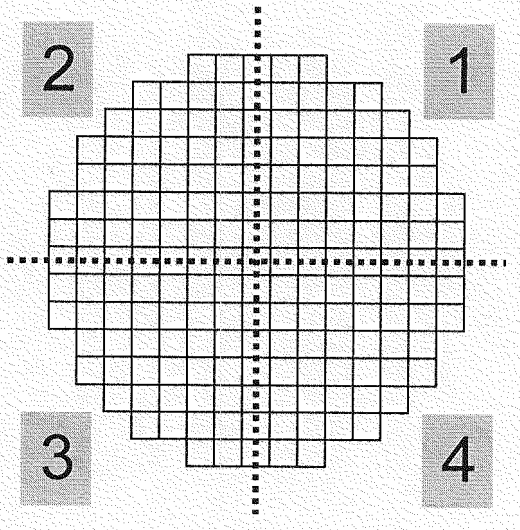
A. None

B. 2

C. 3

D. 4

Full Core Display



Question # Answer	50 D	Question Developer Initials/Date: NTP 3/1/09

Knowledge and Ability Reference Information						RO	SRO
295023 Refueling Accidents AA1.06 - Ability to operate and/or monitor the following as they apply to REFUELING ACCIDENTS : Neutron monitoring					Importance Rating	3.3	3.4
Level	RO	**Tier #**	1	**Group #**	1		
References		ABN-7		205			
Explanation:	The plant is shutdown with fuel shuffling in-progress. IAW ABN-7, Unexplained Reactivity Change, any SRM which rises 8 times the initial count rate requires entry into the procedure, and manual actions by the refuel floor operators (remove the bundle from the core). The unexpected indications could occur when a fuel bundle is loaded into the incorrect core location or into the correct location but incorrect orientation. It may also occur as a result of incorrect fuel loading from the manufacturing process, or simply by incorrect calculations when designing the core. Of the values provided, only SRM 24's final count rate was more than 8 times its original. SRM is located in core quadrant 4. Answer D is correct. Answers B & C both show increases in count rates with final rates larger than that from SRM 24, but not exceeding the 8-times limit. Answers B & C are incorrect. Answer A is incorrect since a quadrant is affected.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0029 LO 215-10445 Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.						

Question Source	Bank		Modified Bank	X	New	
Question Cognitive Level:	Memory or Fundamental Knowledge		X 1:P	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41	7	55.43			
Time to Complete: 1-2 minutes						

Question 51 **1 Point**

The plant was at rated power when Torus water began to lower uncontrollably. The time line of the event is provided below: (T is in minutes)

- T = 0 Torus water level indicates 153"
- T = 20 Torus water level indicates 133"

Assume that the Torus water level lowers at a constant rate.

Which of the following is correct (**See Attached**)?

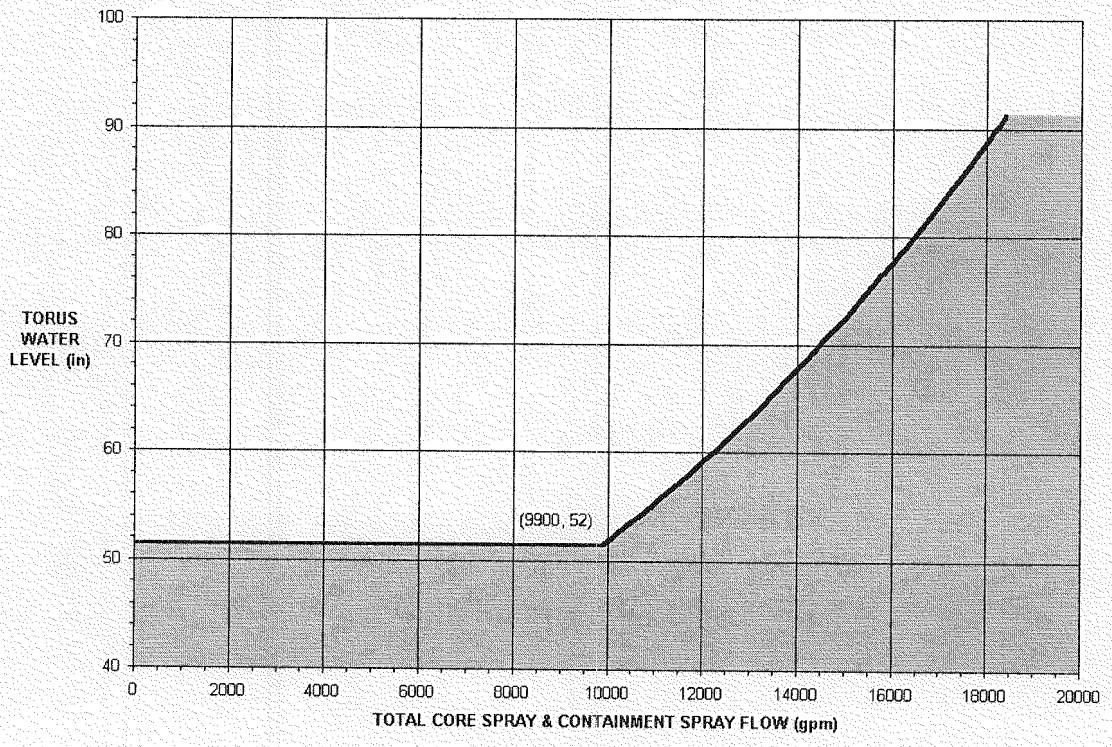
A. At T = 26, the Torus Vent Valves are unavailable.

B. At T = 35, the function of the Downcomers is lost.

C. At T = 45, **ALL** Core Spray Pumps are unavailable due to Vortex concerns.

D. At T = 70, the EMRV Quenchers are uncovered.

Core Spray Vortex Limit



Question # Answer	51 D	Question Developer Initials/Date: 3/1/09

Knowledge and Ability Reference Information						RO	SRO
295030 Low Suppression Pool Water Level EA2.01 - Ability to determine and/or interpret the following as they apply to LOW SUPPRESSION POOL WATER LEVEL : Suppression pool level					Importance Rating	4.1	4.2
Level	RO	**Tier #**	1	**Group #**	1		
References		EOP Bases		EMG-SP4		3E-200-08-016	

Explanation:	The plant was at rated power when torus water level began to lower. From the information given, the drop in water level is 1"/min (153" to 143" [EOP entry] in 10 minutes; 143" to 133" in 10 minutes; both equate to 10"/10 minutes or 1"/minute). The downcomers become uncovered and lose their function when torus water level falls to 110", and the EMRV quenchers will become uncovered when water level drops to 90" When T = 70 minutes, torus water level is 83" (153 – 70 = 83"). At this water level, the EMRV quenchers will be uncovered. Answer D is correct. The torus vent valve become disabled when torus water level goes high. Answers A is incorrect. When T = 35 minutes, water level is 118" (153 – 35 = 118). At this water level, the function of the downcomers is still intact. Answer B is incorrect. When T = 45 minutes, water level is 108" (153" – 45" = 108"). At this water level core spray vortex is not a concern (IAW EMH-SP4, there is no vortex concern when torus water level is above 92"). Answer C is incorrect.
References to be provided during exam:	None
Learning Objective	2621.845.0.0056 LO 3000 Using procedure EMG-3200.02, evaluate the technical basis for each step in the procedure, and apply this evaluation to determine correct courses of action under emergency conditions.

Question Source	**Bank**		**Modified Bank**	**X**	**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		**X 3:SPK**
10 CFR Part 55 Content:	**55.41**	**10**	**55.43**			
Time to Complete: 1-2 minutes						

Question 52 **1 Point**

The plant is at rated power. Which of the listed events will **ALWAYS** result in the following annunciator alarming:

- GENERATOR – MN FIELD BRKR TRIP

A. RPV water level 142"

B. RPV pressure 1050 psig

C. Startup Transformer SA lockout

D. Moisture Separator Drain Tank high level

Question # Answer	52 B	Question Developer Initials/Date: NTP 3/1/09

Knowledge and Ability Reference Information						RO	SRO
295005 Main Turbine Generator Trip AA2.04 - Ability to determine and/or interpret the following as they apply to MAIN TURBINE GENERATOR TRIP : Reactor pressure					Importance Rating	3.7	3.8
Level	RO	**Tier #**	1	**Group #**	1		
References	ABN-10		LP 8280050		RAP-H1f		
Explanation:	The plant is at rated power. The annunciator shows that the main generator field breaker has tripped open. With the generator on-line, every turbine generator trip will energize this annunciator. So, the question asks which of the listed events will result in a turbine generator trip. When RPV pressure reaches 1045 psig, an auto scram will occur, which will then generate a turbine trip and generator trip and the annunciator will alarm. Answer B is correct. An RPV water level of 139.9" will also initiate an auto scram and subsequent turbine trip. There is no trip at a level of 142". Manual operator actions may include inserting a scram if RPV water level cannot be controlled and the setpoint is being approached, but there is no assurance that the level of 142" will always result in a scram. Answer A is incorrect. At rated power, the lockout of startup transformer will not result in a scram or turbine trip. A lockout on the main or auxiliary transformer will. Answer C is incorrect. A turbine generator trip will occur on a moisture separator high level, not from a moisture separator drain tank high level. If the moisture separator drain tank high level results in a moisture separator high level, a trip will occur. But, this will not occur always. Answer D is incorrect.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0051 LO 249-10449 State the function and interpretation of system alarms, alone and in						

	combination, as applicable in accordance with the system RAPs.					
Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:F	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**	10	**55.43**			
Time to Complete: 1-2 minutes						

Question 53 **1 Point**

The plant was at near-rated power with main generator voltage control in **MANUAL**.

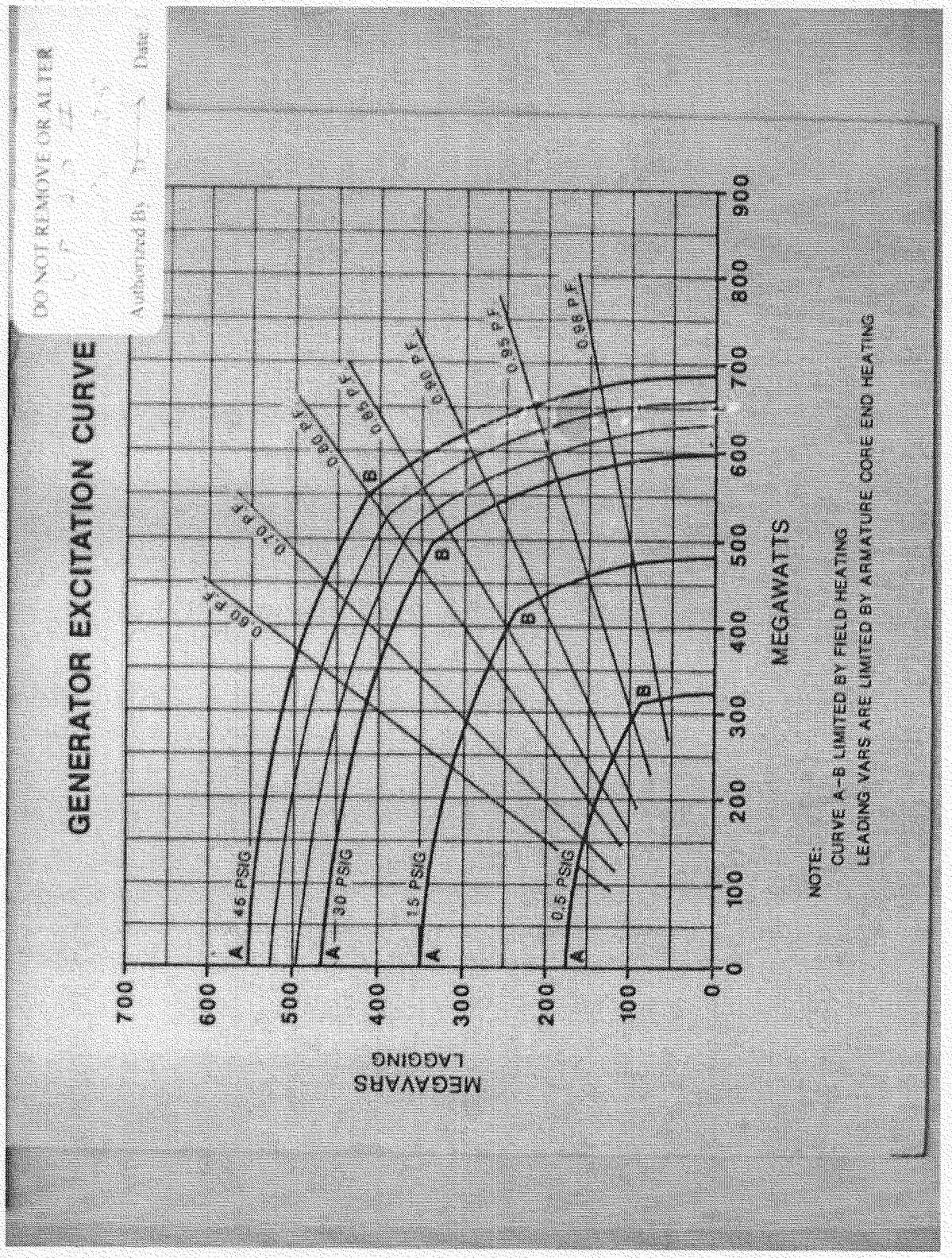
The following plant conditions currently exist:

- GROSS MEGAWATTS indicates 600 AC MEGAWATTS
- MEGAVARS indicates 125 MEGAVARS OUT
- HYDROGEN PRESS indicates 45 psig

The System Owner/Dispatcher has notified the Control Room of an electrical grid disturbance due to the trip of 2 generating units. You are requested to raise the plant MVAR OUT loading.

Which of the following states the **MAXIMUM** allowable generator MVAR loading (OUT) and how MVARs is adjusted by the CRO? (Assume a constant MWe loading) **[See attached]**

	Maximum MVAR (approx)	How Adjusted
A.	385	Adjust the AMPLIDYNE ADJUST rheostat
B.	335	Adjust the EXCITER FIELD RHEOSTAT CONTROL 70M switch
C.	335	Adjust the AMPLIDYNE ADJUST rheostat
D.	385	Adjust the EXCITER FIELD RHEOSTAT CONTROL 70M switch


DO NOT REMOVE OR ALTER
Authorized By
Date
GENERATOR EXCITATION CURVE
MEGAVARS LAGGING
MEGAWATTS
700
600
500
400
300
200
100
0
0
100
200
300
400
500
600
700
800
900
46 PSIG
30 PSIG
15 PSIG
0.5 PSIG
0.98 P.F.
0.95 P.F.
0.90 P.F.
A
B
NOTE:
CURVE A–B LIMITED BY FIELD HEATING
LEADING VARS ARE LIMITED BY ARMATURE CORE END HEATING

Question # Answer	53 B	Question Developer Initials/Date: NTP 3/2/09

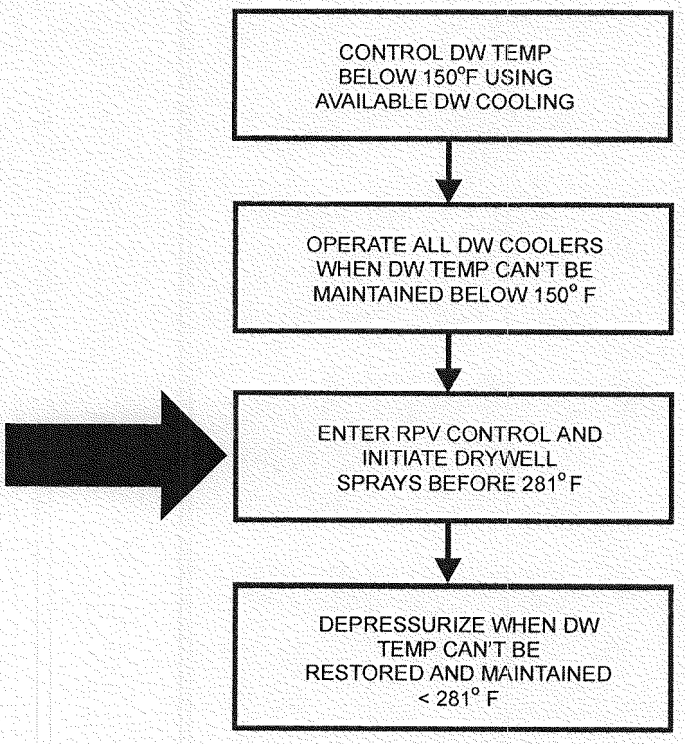
Knowledge and Ability Reference Information						RO	SRO
700000 Generator Voltage and Electric Grid Disturbances AA2.01 - Ability to determine and/or interpret the following as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: Operating point on the generator capability curve.					**Importance Rating**	3.5	3.6
Level	RO	**Tier #**	1	**Group #**	1		
References	336.1						
Explanation:	With the main generator voltage control in manual, VARs is adjusted by manipulating the EXCITER FIELD RHEOSTAT CONTROL 70M switch. From looking at the supplied generator capability curve, the maximum MVARs at a given 600 MWe at 45 psig hydrogen pressure, is about 340 MVARs. Answer B is incorrect. The other answers either list the incorrect switch or the incorrect MVAR loading. If the candidate misread the graph, the max loading which is just under the 350 line or 335 could be misread as being just under the 400 line or 385.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0025 LO 248-10445 Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.						

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPR
10 CFR Part 55 Content:	**55.41**	**5**	**55.43**			
Time to Complete: 1-2 minutes						

Question 54 **1 Point**

The overview of the Drywell temperature control leg in the Primary Containment Control EOP is shown below.

IAW the EOP Users Guide, which of the following states the bases for entering the RPV Control EOP in the 3rd box below?



A. It ensures a reactor scram is initiated before the Drywell Air Coolers are tripped in later steps.

B. It ensures a reactor scram is initiated before the Recirculation Pumps are tripped in later steps.

C. It ensures the reactor is in the lowest energy state to reduce any impacts on the Secondary Containment.

D. It ensures the reactor is in the lowest energy state prior to meeting any requirement to initiate boron.

Question # Answer	54 B	Question Developer Initials/Date: NTP 3/2/09

Knowledge and Ability Reference Information						RO	SRO
295006 SCRAM 2.4.18 - Emergency Procedures / Plan: Knowledge of the specific bases for EOPs.					Importance Rating	3.3	4.0
Level	**RO**	**Tier #**	**1**	**Group #**	**1**		
References							
Explanation:	IAW the reference, the direction to enter RPV Control ensures a reactor scram is initiated before the Recirculation Pumps are tripped in later steps. Recirculation pumps and DW air coolers are tripped prior to initiating DW sprays. Answer B is correct and answer A is incorrect. Any primary leak in the secondary containment would be impacted by RPV pressure. Thus, reducing the energy in the RPV would help with primary leaks into the secondary containment. Answer C is true for primary coolant leaks into the secondary containment, but it is nit the reason at this step in the Primary Containment Control EOP. The boron initiation temperature limit, used in ATWS events, is based on reactor power and more margin is achieved as power gets smaller, but this is not the basis for the step in the Primary Containment Control EOP. Answer D is incorrect.						
References to be provided during exam:	None						
Learning Objective	2621.845.0.0056 LO 3000 Using procedure EMG-3200.02, evaluate the technical basis for each step in the procedure, and apply this evaluation to determine correct courses of action under emergency conditions.						

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:B	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**	10	**55.43**			
Time to Complete: 1-2 minutes						

Question 55 **1 Point**

The plant was at rated power when an event occurred requiring the Operator to insert a manual scram. The scram attempts failed and an electric ATWS was in-progress.

Which of the following actions is available to insert the control rods **AND** what indication will be available that shows the action will be successful?

	Required Action	Indication of Success
A.	Vent the Scram Air Header	Annunciator CONTROL AIR PRESS LO will alarm
B.	Vent the Scram Air Header	RPS 1/RPS 2 SCRAM SOLENOIDS will **DE-ENERGIZE**
C.	Open the individual Scram Test Switches	RPS 1/RPS 2 SCRAM SOLENOIDS will **DE-ENERGIZE**
D.	Open the individual Scram Test Switches	SDV ISOLATION will show the SDV valves **CLOSED**

Question # Answer	55 A	Question Developer Initials/Date: NTP 3/2/09

Knowledge and Ability Reference Information						RO	SRO
295037 SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown 2.4.35 - Emergency Procedures / Plan: Knowledge of local auxiliary operator tasks during emergency and the resultant operational effects.					Importance Rating	3.8	4.0
Level	RO	**Tier #**	1	**Group #**	1		
References		SP-21		237E566 sh. 3	2013 sh.6		

Explanation:

The plant was at power when an electric ATWS occurred. In this ATWS, RPS does not de-energize and the RPS1/RPS2 Group Solenoids remain energized. Both of the actions stated can be used in an electric ATWS (vent the scram air header opening the individual scram test switches). Venting the scram air header is performed by the EO in the plant.

When the scram air header is vented and isolated, this will vent all control air and the scram valves will re-position from loss of air. When air pressure is dropping, the Control Air Press Lo annunciator will alarm. This annunciator is normally not-alarmed but will alarm on a normal scram. Answer A is correct.

Venting the scram air does nothing to change the electrical state of the Group Solenoid lights (ie, RPS remains energized as it was before the vent) and the indications remain the same (energized). Answer B is incorrect.

Opening an individual scram test switch acts to de-energize the scram pilot valves for the selected HCU. It does de-energize the group solenoid lights. Answer C is incorrect.

On a normal scram, the solenoids to the SDV valves become de-energized and the valves will close. On an electrical ATWS, they remain energized and open. The individual scram test switches have no impact on these valves and they remain open, even though each scrammed control rod delivers hot water to the SDV. Answer D is incorrect.

References to be provided during exam:	None	

Learning Objective	2624.828.0.0034 LO 212-10446 Identify and explain system operating controls/indications under all plant operating conditions.					
Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:PEO
10 CFR Part 55 Content:	**55.41**	10	**55.43**			
Time to Complete: 1-2 minutes						

Question 56 **1 Point**

The plant was at rated power when the Operator reported the following:

- RPV pressure has lowered to 1010 psig
- Generator electric indicates 585 MWe
- REACTOR FEEDWATER INLET TEMP indicates 302 °F
- The ROD DRIFT annunciator is **NOT** alarming
- CORE ΔP has lowered by 3.3 psid

Which of the following states the event that has occurred and the required action? (Assume that **NO** Operator actions have occurred)

	Event	Required Action
A.	A Feedwater heater(s) has tripped	Reduce power to prevent exceeding rated power
B.	The EPR setpoint has drifted	Place the MPR in service to prevent further changes
C.	Several control rods have moved inward several notches	Manually scram the reactor to ensure the reactor is in an analyzed state
D.	A recirculation pump has tripped	Close the affected pump discharge valve to prevent windmilling the pump

Question # Answer	56 D	Question Developer Initials/Date: NTP 3/2/09

Knowledge and Ability Reference Information		RO	SRO
295001 Partial or Complete Loss of Forced Core Flow Circulation 2.2.44 Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.	**Importance Rating**	4.2	4.4

Level	RO	Tier #	1	Group #	1

References	Simulator	301.2	ABN-2

Explanation:

The plant was at rated power when indications have changed. These indications show the following: RPV has lowered from 1020 psig to 1010 psig; generator electric has lowered from about 640 MWe to 585 MWe; FW temperature entering the reactor has dropped from about 312 °F to 302 °F; and core ΔP has lowered. These indications show a lowering of reactor power. A loss of a recirculation pump (a partial loss of forced core flow) would be indicative of these indications. Answer D is correct.

If a FW heater tripped, then colder water into the RPV would result in a rising power. If this occurred, then lowering reactor power is the correct action. Answer A is incorrect.

An EPR setpoint drift can affect reactor pressure and electrical output. If the setpoint failed in such a way to call for the turbine control valves to open further, then RPV pressure would drop, but generator electric would rise. If it went the other direction, then RPV pressure would rise and electric output would drop. Answer C is incorrect.

At rated power, there would be no control rods selected. If any control rod were to move at least a notch, then the control rod drift annunciator would be in alarm. A manual scram is required for multiple control rods drifting. Answer D is incorrect.

References to be provided during exam:	None	

Learning Objective	2621.828.0.0038 LO 202-10450 Describe and interpret procedure sections and steps for plant

	emergency or off-normal conditions that involve this system including personnel allocation and equipment operation IAW applicable ABN, EOP & EOP Support Procedures and EPIPs.

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 2:DR
10 CFR Part 55 Content:	**55.41**	**5**	**55.43**			
Time to Complete: 1-2 minutes						

Question 57 **1 Point**

A fire was detected in the 4160V C Vault. The fire suppression system was manually activated.

Which of the following cautions apply prior to entering the room?

Caution must be exercised due to the effects of the fire suppression of ....

A. CO_2 in the atmosphere.

B. halon in the atmosphere.

C. water spray on energized circuits.

D. water spray and flooding of other areas.

Question # Answer	57 A	Question Developer Initials/Date: NTP 3/3/09

Knowledge and Ability Reference Information						RO	SRO
600000 Plant Fire On-site AK1.02 - Knowledge of the operation applications of the following concepts as they apply to Plant Fire On Site: Fire fighting					Importance Rating	2.9	3.1
Level	RO	**Tier #**	1	**Group #**	1		
References		ABN-29		333			
Explanation:	If a fire is detected in either 4160 vault C or D, the ABN directs that if portable extinguishers cannot extinguish the fire, then the low pressure CO_2 system shall be activated. Procedure 333 directs that if the system was activated, then SCBA is required prior to entry. Answer A is correct. Other distractors are incorrect but plausible as it lists hazards related to other suppression methods at the station and if the candidate does not know which fire suppression system is activated.						
References to be provided during exam:	None						
Learning Objective	2624.828.0.0019 LO 286-10445 Given a set of system indications or data, evaluate and interpret them to determine limits, trends and system status.						
Question Source	**Bank**		**Modified Bank**		**New**	X	
Question Cognitive Level:	**Memory or Fundamental Knowledge**	X 1:P	**Comprehension or Analysis**				
10 CFR Part 55 Content:	**55.41**	**5**	**55.43**				
Time to Complete: 1-2 minutes							

Question 58 **1 Point**

The plant was at rated power when a LOCA occurred. Present plant conditions are as follows:

- RPV water level is 10" and lowering
- RPV pressure is 470 psig and lowering
- All systems are available and operating as designed

In the RPV water level leg of the RPV Control – No ATWS EOP, Emergency Depressurization (ED) is required when RPV water level reaches 0" and an injection source is lined up and running.

Which of the following states the bases for waiting until RPV water level lowers to 0" to ED?

A. It allows the Operators time to align Condensate Transfer to the Core Spray System.

B. This ensures the peak cladding temperature is limited to 2200 °F while steam cooling.

C. It maximizes the time that adequate core cooling is assured through submersion.

D. It allows time to initiate Torus Cooling in preparation for the Emergency Depressurization.

Question # Answer	58 C	Question Developer Initials/Date: NTP 3/3/09

Knowledge and Ability Reference Information						RO	SRO
295031 Reactor Low Water Level EK3.02 - Knowledge of the reasons for the following responses as they apply to REACTOR LOW WATER LEVEL : Core coverage					Importance Rating	4.4	4.7
Level	RO	**Tier #**	1	**Group #**	1		
References		EOP Users Guide					
Explanation:	The plant was at power when a LOCA occurred. RPV water level is 10" and lowering and RPV pressure is currently above the shutoff head of the running core spray pumps. IAW the EOP users guide, the core remains covered (submerged) and adequate core cooling is assured. ED should not be performed until adequate core cooling is threatened because: adequate core cooling is maintained so long as RPV water level remains above the top of active fuel (TAF); the time during which RPV water level decreases to TAF can best be used to lineup, complete lineups, or attempt to restore injection sources; and, cooling the upper portion of the core with steam (steam cooling) occurs when RPV water level has decreased into the core region. Answer C is correct. Using condensate transfer to inject into the RPV through the core spray system is an alternate injection source. But, with core spray operating as designed, it is not correct to secure core spray to allow condensate transfer injection. Answer A is incorrect. As stated above steam cooling is only viable when RPV water level is below TAF. Also, with steam cooling, cladding temperature should not exceed 1800 °F. Answer B is incorrect. Answer D is incorrect, but plausible since opening the EMRVs will lead to Torus Cooling.						
References to be provided during exam:	None						
Learning Objective	2624.845.0.0052 LO 3055 Given a copy of RPV Control, describe in detail each step or conditional statement, including technical basis, and how to perform						

	each step as required.					
Question Source	**Bank**	**X**	**Modified Bank**		**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**		**X** 1:B	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**	**5**	**55.43**			
Time to Complete: 1-2 minutes						

Question 59 **1 Point**

The plant was starting up after a refuel outage. Present plant conditions are as follows:

- Control rod withdrawals are in progress
- The SRMs have each increased by a factor of 16 (4 doublings)

If a control rod drop accident were to occur on a control rod indicating full out, and the reactor goes prompt critical, which of the following states how the rod drop accident should have been **PREVENTED AND** how the plant responds to the event?

	Accident Prevention Method	Plant Impact
A.	Successful completion of the RWM operability test	Plant scram on SRMs
B.	Successful completion of the RWM operability test	Plant scram on IRMs and/or APRMs
C.	Successful coupling check of fully withdrawn control rods	Plant scram on SRMs
D.	Successful coupling check of fully withdrawn control rods	Plant scram on IRMs and/or APRMs

Question # Answer	59 D	Question Developer Initials/Date: NTP 3/3/09

Knowledge and Ability Reference Information		RO	SRO
295014 Inadvertent Reactivity Addition AK1.01 - Knowledge of the operational implications of the following concepts as they apply to INADVERTENT REACTIVITY ADDITION : Prompt critical	**Importance Rating**	3.7	3.8

Level	RO	Tier #	1	Group #	2

References	TS Table 3.1.1	ABN-6	302.2

Explanation:

A startup is in progress, and criticality is close. A control rod which indicates full out, experiences a control rod drop accident and the reactor goes prompt critical. This will result in a very rapid rise in reactor power. The SRMs do not provide any scram function as do the IRMs and APRMs. Power will rise past the scram point of the IRMs and probably the APRMs, which will insert all control rods to stop the rise in power.

To experience a rod drop accident, two things must first take place: the control rod blade must become uncoupled from its drive, and the blade must stick somewhere in the core. At a later time, with the drive at the full out position, the control rod blade becomes unstuck and falls to the full out position.

IAW 302.2, each fully withdrawn control rod shall have a coupling check performed, which verifies the control rod blade is attached to its drive. IAW ABN-6, if an uncoupled control rod is discovered during the coupling check at the current power level, the control rod is fully inserted. Answer D is correct.

Because the SRMs do not provide a scram signal, answer C is incorrect.

The RWM is designed to limit the amount of reactivity to each control rod. This will act to limit the amount of power rise during a control rod drop accident but does not act to prevent the accident. Answers A & B are incorrect.

References to be provided during exam:	None	

Learning	2621.828.0.0029 LO 215-10444

Objective	Describe the interlock signals and setpoints for the affected system components and expected system response including power loss or failed components.					
Question Source	**Bank**	**X**	**Modified Bank**		**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		**X** 3:PEO
10 CFR Part 55 Content:	**55.41**	10	**55.43**			
Time to Complete: 1-2 minutes						

Question 60 **1 Point**

The plant was at rated power when the Control Room was notified by the Radwaste Operator of the following annunciator alarming:

- 1-7 SUMP REACTOR BLDG FLR DRAIN SUMP HIGH LEVEL

Answer the following:

1. Which of the following states why Sump 1-7 was specifically chosen (as compared to other RB sumps) as an entry into the EOP?
2. What automatic actions occur to alleviate the condition for which the EOP is entered?

	Reason Sump 1-7 Chosen	Automatic Actions
A.	Sump 1-7 is the **SMALLEST** RB sump	The sump pump starts **AND** several sump inputs are isolated
B.	Sump 1-7 is the **ONLY** RB sump with a high level alarm	The sump pump starts **AND** the Bypass Drain valve **OPENS**
C.	Sump 1-7 is the **SMALLEST** RB sump	The sump pump starts **AND** the Bypass Drain valve **OPENS**
D.	Sump 1-7 is the **ONLY** RB sump with a high level alarm	The sump pump starts **AND** several sump inputs are isolated

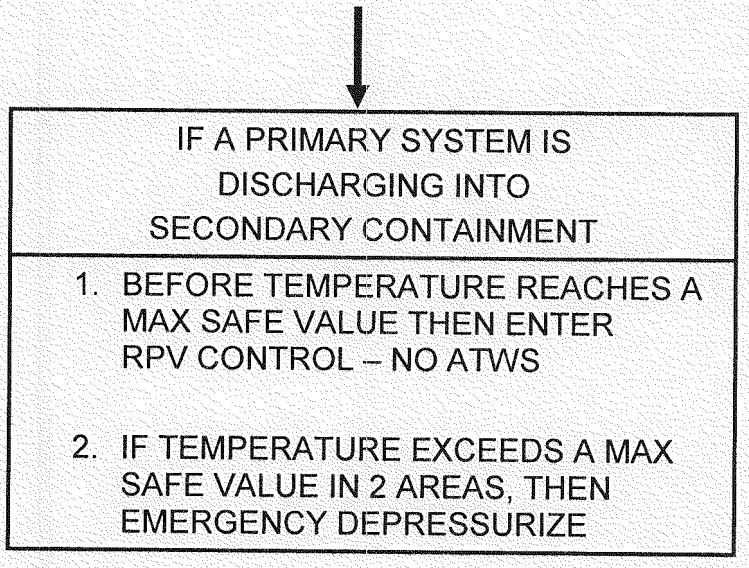
Question # Answer	60 D	Question Developer Initials/Date: NTP 3/3/09

Knowledge and Ability Reference Information						RO	SRO
295036 Secondary Containment High Sump/Area Water Level EK2.01 - Knowledge of the interrelations between SECONDARY CONTAINMENT HIGH SUMP/AREA WATER LEVEL and the following: Secondary containment equipment and floor drain system					**Importance Rating**	3.1	3.2
Level	RO	**Tier #**	1	**Group #**	2		
References		JC 147434 sh. 3		RAP-RB1C(1-7)			
Explanation:	Inputs into Sump 1-7 include the drains from Sump 1-6 and floor drains. On a high water level, the sump pump starts and inputs from Sump 1-6 and floor drain are isolated. These actions will help in clearing the high water condition in the sump. IAW the EOP Users Guide, Sump 1-7 is specifically chosen because it is the only RB sump which is instrumented with an alarm. Answer D is correct. All other answers are incorrect but plausible if the candidate does know the EOP bases and the system operation.						
References to be provided during exam:	None						
Learning Objective	2621.845.0.0057 LO 3082 Using the Secondary Containment Control EOP, evaluate the technical basis for each step and apply this evaluation to determine the correct course of action under emergency conditions.						

Question Source	**Bank**		**Modified Bank**	X	**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:F	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**	7	**55.43**			
Time to Complete: 1-2 minutes						

Question 61 **1 Point**

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



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

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

A. 1 **ONLY**

B. 1 AND 2

C. 2 AND 3

D. 1, 3 AND 4

Question # Answer	61 B	Question Developer Initials/Date: NTP 3/3/09

Knowledge and Ability Reference Information						RO	SRO
295032 High Secondary Containment Area Temperature EK3.01 - Knowledge of the reasons for the following responses as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE : Emergency/normal depressurization					Importance Rating	3.5	3.8
Level	RO	**Tier #**	1	**Group #**	2		
References		EOP Users Guide					
Explanation:	IAW the EOP Users Guide, the temperature increases is so wide spread that is poses a direct threat to secondary containment integrity, equipment located in the secondary containment or continued safe operation. ED will place the plant in its lowest energy state and will reduce the driving head and flow from primary systems that are discharging into the secondary containment. Answer B (1 and 2) is correct and answer A (1 only) is incorrect. It is true that lowering RPV pressure will make alternate, low pressure systems available for RPV injection, but it is not the bases for the ED. Answer C is incorrect (2 and 3). ED is performed by opening the EMRVs which releases the energy from the RPV into the Torus. ED does not reduce the amount of energy to be released to the primary containment. Answer D (3 and 4) is incorrect.						
References to be provided during exam:	None						
Learning Objective	2621.845.0.0057 LO 3082 Using the Secondary Containment Control EOP, evaluate the technical basis for each step and apply this evaluation to determine the correct course of action under emergency conditions.						

Question Source	Bank		Modified Bank		New	X
Question Cognitive Level:	Memory or Fundamental Knowledge		X 1:B	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41	5	55.43			
Time to Complete: 1-2 minutes						

Question 62 **1 Point**

The plant was at rated power with the MASTER FEEDWATER LEVEL CONTROLLER in MAN when a Recirculation Pump tripped. The operator noted the following:

- RPV water level peaked at 183"

Which of the following states the expected automatic plant response from this event? (Assume **NO** Operator action)

1. The MFRV A LIMIT, MFRV B LIMIT, & MFRV C LIMIT lights **ENERGIZE** and remain **ENERGIZED**
2. **ALL** Feedwater Pumps indicate **RED** light **OFF** and **GREEN** light **ON**
3. **ALL** MSIVs indicate **RED** light **OFF** and **GREEN** light **ON**
4. **ALL** Turbine Reheat and Intercept Valves indicate **RED** light **OFF** and **GREEN** light **ON**
5. MAIN BREAKER 1A **AND** 1B indicate **RED** light **ON** and **GREEN** light **OFF**

A. 2 and 4

B. 2 and 5

C. 1, 2 and 3

D. 2, 4, and 5

Question # Answer	62 A	Question Developer Initials/Date: NTP 3/4/09

Knowledge and Ability Reference Information						RO	SRO
295008 High Reactor Water Level AA1.03 - Ability to operate and/or monitor the following as they apply to HIGH REACTOR WATER LEVEL : Main steam system					Importance Rating	3.1	3.1
Level	**RO**	**Tier #**	**1**	**Group #**	**2**		
References	ABN-10		RAP-H5d RAP-H5f		RAP-H7d RAP-J8c		

Explanation:

The plant was at rated power with FW level control in manual when a recirculation pump tripped. With reactor power reduced and FW at the rated power flow, RPV water level will rise. RPV water level peaked at 183" which results in a turbine trip at 175" and Reactor Overfill Protection (ROPS) activation at 181", which results in the trip of all operating FW pumps (ROPS is automatically bypassed when total FW flow is < 2.23 million lb/hr, but this is not the case here). When the turbine trips, all reheat and intercept valves go closed. Also when the turbine trips, main breakers 1A and 1B open and Startup Breakers S1A and S1B close to supply power to the station from the startup transformers.

At rated power, feedwater total flow is about 7.2 million lb/hr evenly distributed among the 3 FW pumps and so each FW pump flow is about 2.4 million lb/hr flow. It is conceivable that when the turbine tripped at 175" and reactor scrammed, that FW flow could rise since RPV pressure has lowered. The MFRV LIMIT lights, which are normally de-energized, will energize when an individual FW pump flow reaches 2.76 million lb/hr flow. If each individual FW pump flow did rise to this limit right after the scram, then this runout protection clamps flow at the limit. But as flow rose to 183", all FW pumps will trip. The runout MFRV LIMIT lights will then de-energize as flow goes below the limit.

There is no automatic closure of the MSIVs on high RPV water level.

Therefore, the following is correct:

- Selection 1 is false (MFRV LIMIT lights do not remain energized)
- Selection 2 is true (all FW pumps are tripped)

	• Selection 3 is false (MSIVs are open) • Selection 4 is true (turbine trip with reheat/intercept valves closed) • Selection 5 is false (main breakers 1A, 1B are open) Answer A is correct.
References to be provided during exam:	None
Learning Objective	2621.828.0.0055 LO 216-10444 Describe the interlock signals and setpoints for the affected system components and expected system response including power loss or failed components.

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:PEO
10 CFR Part 55 Content:	**55.41**	7	**55.43**			
Time to Complete: 1-2 minutes						

Question 63 **1 Point**

The plant was at rated power when the MSIVs inadvertently and **SIMULTANEOUSLY** closed. The Operator makes the following report:

- EMRVs are cycling open (for 12 seconds) and closed (for 15 seconds)
- ISOL CONDENSER SHELL A **AND** B indicate 205 °F and rising
- The EDGs are in standby

Which of the following is correct for the conditions provided? (Assume **NO** Operator actions)

A. An ATWS has occurred with power < 2%.

B. An ATWS has occurred with power > 2%.

C. This is normal for an isolated full power scram.

D. Reactor power can be reduced with Recirculation flow **AND** control rods.

Question # Answer	63 B	Question Developer Initials/Date: NTP 3/4/09

Knowledge and Ability Reference Information						RO	SRO
295007 High Reactor Pressure AA2.02 - Ability to determine and/or interpret the following as they apply to HIGH REACTOR PRESSURE : Reactor power					Importance Rating	4.1	4.1
Level	RO	**Tier #**	1	**Group #**	2		
References		420		USAR Table 5.2-1			

Explanation:

The reactor was at rated power when all MSIVs closed. This should have resulted in a reactor scram. But the indications show otherwise: EMRVs are cycling on high RPV pressure, and both isolation condensers are in service (as evidenced by the high shell water temperature). The isolation condensers automatically initiate on high RPV pressure (1060 psig) or RPV water level low-low (86"). The ICs must have initiated on RPV high pressure since the EDGs are in standby (EDGs will idle start on a high DW pressure or RPV water level low-low; since there are no indications of any primary containment problems, then there must be NO RPV water level low-low condition).

Each IC can take about 3% power each of steam. With both in service, and with EMRVs cycling, then power is at least 6%. Therefore, an ATWS has occurred with power still above 2%. Answer B is correct and answer A and C are incorrect.

It is true that terminating recirculation flow and inserting control rods during an ATWS can reduce power. But 3 recirculation pumps trip immediately on 1060 psig RPV pressure and the other 2 pumps trip if the high pressure is sustained for > 1.05 seconds. Therefore, all recirculation pumps have already tripped since EMRVs are open under high pressure conditions for 12 seconds (the lowest EMRVs open at > 1060 psig). Answer D is incorrect.

References to be provided during exam:	None

Learning Objective	2621.845.0.0053 LO 3055A Given a copy of RPV Control With ATWS, describe in detail each step or conditional statement, including technical basis, and how to perform

	each step as required.					
Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**	10	**55.43**			
Time to Complete: 1-2 minutes						

Question 64 **1 Point**

The plant was starting up after an extended refuel outage. Present plant conditions are as follows:

- Reactor power indicates 50%
- RPV pressure indicates 1000 psig
- Feedwater Pumps A and B are in service
- Condensate Pumps B and C are in service

An event then occurs resulting in the following annunciator alarming:

- MN BRKR 1B 86 LKOUT TRIP

Which of the following states the impact on the plant? (Assume **NO** Operator action unless stated)

A.
- Feedwater Pumps A and B will trip
- The reactor will scram on RPV low water level

B.
- Feedwater Pump B will trip
- Feedwater Pump A will remain running
- The reactor will scram on RPV low water level

C.
- RPV water level will lower
- The Operator can start the standby Feedwater Pump

D.
- RPV water level will lower
- The Operator should insert a manual scram due to the loss of Recirculation Pumps C and E

Question # Answer	64 A	Question Developer Initials/Date: NTP 3/4/09

Knowledge and Ability Reference Information						RO	SRO
295009 Low Reactor Water Level 2.4.31 - Emergency Procedures / Plan: Knowledge of annunciator alarms, indications, or response procedures.					Importance Rating	4.2	4.1
Level	RO	**Tier #**	1	**Group #**	2		
References		RAP-T2c		RAP-J1d			
Explanation:	The plant is starting up after an extended outage and is at 50% power. The event shows a loss of voltage and lockout on 4160 Bus 1B. When this occurs, feedwater pumps B & C, condensate pumps B & C, recirculation pumps B & D, and other loads on Bus 1B trip. With a loss of both running condensate pumps, the FW pump A, which is still energized, will trip on low suction after a 9 second time delay. This will leave the reactor still at power, although reduced due to the trip of recirculation pumps B & D, with no feedwater injection. RPV water level will lower until the scram setpoint. Answer A is correct. Because Feedwater Pump A trips on low suction, answer B is incorrect. Because the standby feedwater pump is Pump C, and is powered by Bus 1B which has lost power, Pump C cannot be started. Answer C is incorrect. ABN-2 requires a manual scram if multiple recirculation pumps trip. But recirculation pumps C & E are powered from 4160 Bus 1A and are still energized in the given event. Answer D is incorrect.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0017 LO 259-10441 Given the system logic/electrical drawings, describe the system trip signals, setpoints, and expected system response including power loss or failed components.						

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**	10	**55.43**			
Time to Complete: 1-2 minutes						

Question 65 **1 Point**

Which of the following states the required **LOGIC** to **IMMEDIATELY** initiate the Standby Gas treatment System?

High trip of the .....

A. Refuel Floor Radiation Monitor C9 **OR** B9

B. Refuel Floor Radiation Monitors C9 **AND** B9

C. Reactor Building Vent Manifold Radiation Monitor 1 **OR** 2

D. Reactor Building Vent Manifold Radiation Monitor 1 **AND** 2

Question # Answer	65 C	Question Developer Initials/Date: NTP 3/5/09

Knowledge and Ability Reference Information						RO	SRO
295033 High Secondary Containment Area Radiation Levels EA1.03 - Ability to operate and/or monitor the following as they apply to HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS : Secondary containment ventilation					Importance Rating	3.8	3.8
Level	RO	**Tier #**	1	**Group #**	2		
References		RAP-10F1f		651.4.001		330	
Explanation:	A single high trip of any of the radiation monitors listed will result in the automatic initiation of the Standby Gas Treatment System (SGTS). The refuel floor radiation monitors can individually initiate SGTS, but only after a 2-minute time delay. A high trip of either of the RB vent manifold radiation monitors will result in the immediate SGTS initiation. Answer C is correct. The other answers are plausible if the Candidates confuse the logic required to initiate SGTS.						
References to be provided during exam:	None						
Learning Objective	2621.828.0.0042 LO 261-10439 Given the system logic/electrical drawings, describe the system auto initiation signals, setpoints, and expected system response including power loss or failed components.						

Question Source	**Bank**	**X**	**Modified Bank**		**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**		**X** **1:I**	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**	**7**	**55.43**			
Time to Complete: 1-2 minutes						

Question 66 **1 Point**

The plant was at rated power when the following annunciator event occurred:

- Bus 1A became de-energized

Which of the following RO actions is correct IAW OP-OC-101-111-1001, Strategies for Successful Transient Mitigation?

A. Announce the loss of the bus, scram the reactor, then announce the manual scram as an update

B. Announce the loss of the bus and intention to scram the reactor as an update, pause, then scram the reactor

C. Announce the loss of the bus, pause while RPV water level stabilizes, then report RPV water level actions as an update

D. Announce the loss of the bus and intention to lower Recirculation Flow as an update, pause, then reduce Recirculation Flow

Question # Answer	66 B	Question Developer Initials/Date: NTP 3/5/09

Knowledge and Ability Reference Information						RO	SRO
Conduct of Operations 2.1.2 Knowledge of operator responsibilities during all modes of plant operation.					Importance Rating	4.1	4.4
Level	**RO**	**Tier #**	**3**	**Group #**			
References		OP-OC-101-111-1001		ABN-2	301.2		

Explanation:

The plant is at rated power when power is lost to 4160 VAC Bus 1A. This removes power to 1 Feedwater Pump and Condensate pump and several Recirculation Pumps. An Immediate Operator Action in ABN-2, for multiple Recirculation Pump trips, is to manually scram the reactor. IAW OP-OC-101-111-1001, the Operator should first state his intention to scram and to pause before acting. This time allows the SRO to visually or verbally agree with or disagree with the proposed action and stop the action. The Operator will then manually scram the reactor, which is an RO responsibility. Answer B is correct.

Answer A has the correct actions, but the incorrect methodology for performance of the steps. Answer A is incorrect.

Answer C could be misunderstood as correct since the trip of the Recirculation Pumps essentially performs a rapid power reduction and RPV water level will take some time to stabilize. But since the action is incorrect, Answer C is incorrect.

IAW ABN-17, if a single Feedwater Pump trips, the Immediate Operator Action would be to perform a rapid power reduction by reducing Recirculation Flow. Answer B has the correct methodology, but the incorrect action since a manual scram is required. Answer D is incorrect.

References to be provided during exam:	None	
Learning Objective		

Question Source	Bank		Modified Bank		New	X
Question Cognitive Level:	Memory or Fundamental Knowledge		X 1:P	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41	7	55.43			
Time to Complete: 1-2 minutes						

Question 67 **1 Point**

The plant was at rated power when the Operator noted the following observations:

- CRD TOTAL FLOW indicates 10 GPM
- CRD FLOW CONTROLLER indicates 100%
- DRIVE WATER FLOW indicates **DOWNSCALE**
- COOLING WATER FLOW indicates **DOWNSCALE**
- CLG WTR/REACTOR ΔP indicates **DOWNSCALE**
- DRV WTR/REACTOR ΔP indicates **UPSCALE**

Which of the following states the cause for the noted indications and the corrective action?

	Cause	Corrective Action
A.	The CRD **FCV** has failed open	Place the alternate **FCV** in service
B.	The CRD **FCV** has failed closed	Place the alternate **FCV** in service
C.	The CRD cooling water **PCV** has failed closed	Establish CRD cooling water on the cooling water **PCV** bypass valve
D.	The CRD drive water **PCV** has failed closed	Establish CRD drive water on the drive water **PCV** bypass valve

Question # Answer	67 D	Question Developer Initials/Date: NTP 3/5/09

Knowledge and Ability Reference Information						RO	SRO
Conduct of Operations 2.1.7 Ability to evaluate plant performance and make operational judgements based on operating characteristics, reactor behavior, and instrument interpretion.					Importance Rating	4.4	4.7
Level	RO	**Tier #**	3	**Group #**			
References		237E487		302.1			

Explanation:	The plant was at rated power when the operator makes the observations noted. One indication, CRD drive flow downscale, is the normal expected indication when no control rod motion is in progress. Total CRD flow is low with the flow control valve showing full open. If the FCV had failed open, it would show 100% and indicated total flow would be greater than normal, not less than normal. Answer A is incorrect. If the FCV had failed closed, it would indicate no flow. Answer B is incorrect. In either failure, the corrective action would be to place the alternate FCV in service. If the cooling water PCV had failed closed, then drive water and cooling water would both show a greater than normal ΔP – not a downscale ΔP on one and upscale on the other. CRD cooling flow would also increase above normal. Answer C is incorrect. Placing CRD cooling water flow on the FCV bypass is the correct action. If the drive water FCV failed closed, then there would be no CRD cooling water flow or pressure. Since this reduces system flow, the FCV open further to re-establish flow at the setpoint. If the drive water PCV did fail closed, then flow can be re-established on the drive water PCV bypass valve. Answer D is correct.
References to be provided during exam:	None
Learning Objective	2621.828.0.0011 LO 10450 Describe and interpret procedure sections and steps for plant emergency or off-normal conditions that involve this system including personnel allocation and equipment operation IAW applicable ABN,

	EOP & EOP Support Procedures and EPIPs.					
Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**	**5**	**55.43**			
Time to Complete: 1-2 minutes						

Question 68 **1 Point**

The plant is starting up after a refuel outage.

Which of the following states who can manipulate Reactor Controls?

A. An Equipment Operator candidate who is being directly supervised by an active licensed operator.

B. An active licensed operator with a corrective lenses license restriction who does not have his glasses.

C. An inactive licensed operator who is reactivating and who is being directly supervised by an active licensed operator.

D. A Reactor engineer who has been selected for the next initial license training class who is being directly supervised by an active licensed operator.

Question # Answer	68 C	Question Developer Initials/Date: NTP 3/5/09

Knowledge and Ability Reference Information						RO	SRO
Equipment Control 2.2.14 Knowledge of the process for controlling equipment configuration or status.					Importance Rating	3.9	4.3
Level	**RO**	**Tier #**	**3**	**Group #**			

References	OP-AA-103-103 OP-AA-103-102	10CFR55.13	OP-AA-105-102 OP-AA-105-101

Explanation:

The process for maintaining the configuration and status of reactor controls is related to who can change or manipulate the reactor controls. Procedures allow only certain individuals to manipulate the reactor controls (apparatus and mechanisms that the manipulation of would directly affect the reactivity or power level of the reactor).

IAW the OP-AA-103-103, an inactive licensed operator must be enrolled in a license reactivation program to perform main control room manipulations. IAW OP-AA-105-102, the hours spent shift functions will be performed in the presence and under the direct supervision of an active RO or SRO. Therefore, the inactive operator must be reactivating and under the direct supervision of an active operator. Answer C is correct.

It is the operators' responsibility to meet his license restrictions. The operator is only allowed to perform license functions when license restrictions are met. Answer B is incorrect.

Only a trainee enrolled in a license training program can manipulate the controls, while under the direct supervision of a licensed operator. In answer A, the candidate is an EO candidate not a license candidate. In answer D, the system engineer is not yet currently enrolled in the initial license training program. Both answers A & D are incorrect.

References to be provided during exam:	None	

Learning Objective	2621.830.0.0005 LO 2461 Assess the impact on plant operations of a reactivity related evolution.

Question Source	Bank		Modified Bank		New	X
Question Cognitive Level:	Memory or Fundamental Knowledge		X 1:P	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41	10	55.43			
Time to Complete: 1-2 minutes						

Question 69 **1 Point**

The plant is starting up after an outage. The Operator is preparing to synch the main generator by closing 230 KV Breaker GD1. The Operator observes the following:

- The synchscope needle at Panel 8F/9F is rotating in the **SLOW** direction (counterclockwise)
- INCOMING voltage is slightly **GREATER** then RUNNING voltage

Which of the following is the next expected Operator action?

A. Place 230 KV BREAKER GD1 to **CLOSE**.

B. **RAISE** turbine speed using the SPEED LOAD CHANGER.

C. **LOWER** turbine speed using the SPEED LOAD CHANGER.

D. Adjust Generator terminal voltage using the EXCITER FIELD RHEOSTAT CONTROL 70M.

Question # Answer	69 B	Question Developer Initials/Date: NTP 3/5/09

Knowledge and Ability Reference Information					RO	SRO
Equipment Control 2.2.2 Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.				Importance Rating	4.6	4.1
Level	RO	**Tier #**	3	**Group #**		
References	315.1					
Explanation:	The plant is starting up and is preparing to close the first output breaker to synch the generator to the grid. The indications show that incoming voltage is slightly higher than running but that the synchscope is moving in the slow direction. The very next step will be to raise turbine speed using the speed load changer. Answer B is correct and answer C is incorrect. Answer A is incorrect since the generator output is not yet in phase with the grid. It is provided in the question stem that voltage is where it should be right now – slightly higher than running. Once the turbine is sped up, then terminal voltage can be checked again. Answer D is incorrect.					
References to be provided during exam:	None					
Learning Objective	2621.828.0.0025 LO 248-10447 Given normal operating procedures and documents for the system, describe or interpret the procedural steps					

Question Source	Bank		Modified Bank		New	X
Question Cognitive Level:	Memory or Fundamental Knowledge			Comprehension or Analysis		X 3:SPK
10 CFR Part 55 Content:	55.41	6	55.43			
Time to Complete: 1-2 minutes						

Question 70 **1 Point**

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

- RADIATION MONITORS PROCESS WTR – SVC WTR HI/TROUBLE

The EO reports that the Service Water Radiation Monitoring Pump has stopped and **CANNOT** be started.

Which of the following states the required action?

A. Initiate a plant shutdown in preparation for removing Service Water from service.

B. Swap RBCCW heat exchanger cooling water from Service Water to Emergency Service Water.

C. Notify Chemistry to initiate sampling of the discharge IAW the Offsite Dose Calculation Manual.

D. Notify Chemistry to initiate sampling of the intake IAW the New Jersey Pollutant Discharge Elimination System Permit.

Question # Answer	70 C	Question Developer Initials/Date: NTP 3/6/09

Knowledge and Ability Reference Information						RO	SRO
Radiation Control 2.3.11 Ability to control radiation releases.					Importance Rating	3.8	4.3
Level	RO	**Tier #**	3	**Group #**			

References	RAP-10F3g	406.2	CY-OC-170-301 (ODCM)

Explanation:	The plant is at power when the service water radiation monitoring system is no longer functioning. IAW the RAP, chemistry should notified to begin sampling and analyzing discharge canal samples. IAW 406.2 precaution and limitations, chemistry should be notified to comply with the ODCM (which is to sample and analyze samples from the effluent pathway). Answer B is correct. The ODCM requires that the effluent release may continue as long as sampling is properly initiated. If sampling cannot be established, securing the release would be prudent. But as stated in the procedures, sampling is attempted first and answer A is incorrect. Swapping heat exchanger cooling medium, which can be performed, has no impact on the potential release and Answer B is incorrect. The NJPDES Permit does not contain any requirements related to radiological concerns, plus sampling the intake is incorrect. Answer D is incorrect.

References to be provided during exam:	None	

Learning Objective	2621.828.0.0044 LO 00888 Using the procedures, identify and interpret normal and abnormal operation of the Service Water System

Question Source	**Bank**		**Modified Bank**	**X**	**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**		**X** **1:P**	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**	**11**	**55.43**			
Time to Complete: 1-2 minutes						

Question 71 **1 Point**

The plant was at rated power when an ATWS occurred.

IAW SP-21, Alternate Insertion of Control Rods, which of the following alternate control rod insertion methods has the potential to **RAISE** the airborne contamination levels in the Reactor Building?

A. Venting the Scram Air Header

B. De-energizing the Scram Solenoids

C. Venting the Control Rod Drive Over Piston Volume

D. Raising the CRD Cooling Water Differential Pressure

Question # Answer	71 C	Question Developer Initials/Date: NTP 3/6/09

Knowledge and Ability Reference Information						RO	SRO
Radiation Control 2.3.14 Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.					Importance Rating	3.4	3.8
Level	RO	**Tier #**	3	**Group #**			
References		EMG-SP21		GE 197E871	147434 sh. 2 BR 2011 sh. 2		
Explanation:	Several methods to insert control rods IAW SP-21 may result in increased radioactivity in the Reactor Building. Of those listed, which are all ways to insert control rods, only venting the control rod over piston volume has a caution regarding increased airborne contamination levels. This process results in RPV coolant being directed to Reactor Building Sump 1-7. Steam could escape from this sump during the venting process. Answer C is correct.						
References to be provided during exam:	None						
Learning Objective	2621.845.0.0053 LO 3055A Given a copy of RPV Control With ATWS, describe in detail each step or conditional statement, including technical basis, and how to perform each step as required.						

Question Source	**Bank**	X	**Modified Bank**		**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**		**Comprehension or Analysis**	X 3:SPK		
10 CFR Part 55 Content:	**55.41**	12	**55.43**			
Time to Complete: 1-2 minutes						

Question 72 **1 Point**

Which of the following conditions requires that Radiation Protection be notified to assess any radioactive releases including the release of tritium?

A. Initiating Drywell Sprays during EOPs

B. Inserting control rods during an ATWS condition

C. Venting the Primary Containment IAW the Hardcard

D. Initiating the Isolation Condensers during a cooldown

Question # Answer	72 D	Question Developer Initials/Date: NTP 3/6/09

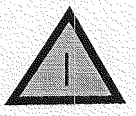
Knowledge and Ability Reference Information					RO	SRO
Radiation Control 2.3.13 Knowledge of Radiological Safety Procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high radiation areas, aligning filters, etc.				**Importance Rating**	3.4	3.8
Level	RO	**Tier #**	3	**Group #**		
References	307					

Explanation:	IAW procedure 307, any time that the Isolation Condensers are placed in service by either manual or automatic initiation, Rad Pro shall be notified to assess, minimize and contain any radioactive releases, including the release of tritium. Using Isolation Condensers during a cooldown from a plant scram has occurred in the past. Operation of the Isolation Condenser System is a Licensed Operator duty. Answer D is correct. Initiating Drywell Sprays during EOP is performed when Drywell pressure or temperature is elevated, usually from a LOCA. Initiating Drywell Sprays requires the use of the ESW pumps. A tube leak in the Containment Spray heat exchanger could release radioactivity to the ESW System and then out to the environment. There is no procedural requirement to notify RP during Drywell Sprays. Answer A is incorrect. Inserting control rods IAW the Support Procedure does have several notes about increased dose potential but does not require RP sampling and assessment. Answer B is incorrect. Venting the Drywell using the hardcard will allow primary containment atmosphere to be release directly to the outside atmosphere through the normal RB Vent System, but there is no requirement to notify RP to assess radioactivity. Answer C is incorrect.
References to be provided during exam:	None
Learning	2621.828.0.0023 LO 02338

Objective	Given plant conditions, evaluate the impact on the Isolation Condenser System and the plant.					
Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:P	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**	12	**55.43**			
Time to Complete: 1-2 minutes						

Question 73 **1 Point**

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



IAW the EOP Users Guide, this designates a Support Procedure ….

A. as high **importance**.

B. will override plant **interlocks**.

C. could cause an **increase** in off-site release rate.

D. to be completed **immediately**, and without delay.

Question # Answer	73 B	Question Developer Initials/Date: NTP 3/6/09

Knowledge and Ability Reference Information						RO	SRO
Emergency Procedures/Plan 2.4.17 Knowledge of EOP terms and definitions.					Importance Rating	3.9	4.3
Level	RO	Tier #	1	Group #	1		
References		EOP Users Guide					
Explanation:	The designated symbol states that plant interlocks may be overridden. Answer B is correct. The other answers may be considered correct if overriding interlocks is not known.						
References to be provided during exam:		None					
Learning Objective	2621.845.0.0050 LO 3065 Recognize how caution statements and notes are represented in the EOP flowcharts.						

Question Source	Bank	X	Modified Bank		New	
Question Cognitive Level:	Memory or Fundamental Knowledge		X 1:D	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41	10	55.43			
Time to Complete: 1-2 minutes						

Question 74 **1 Point**

The plant was at rated power when an event occurred.

From **ONLY** the information provided on the Heat Removal/Core Cooling SPDS screen printout (**SEE ATTACHED**), which of the following is correct?

A. Core Spray is injecting into the RPV.

B. The Tech Spec cooldown rate has been violated.

C. The Isolation Condensers have automatically initiated.

D. The RPV Flooding – No ATWS EOP should be entered.

INSERT CORE COOLING SPDS.PPT HERE

Question # Answer	74 D	Question Developer Initials/Date: NTP 3/7/09

Knowledge and Ability Reference Information					RO	SRO
Emergency Procedures/Plan 2.4.21 Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.				**Importance Rating**	4.0	4.6
Level	RO	**Tier #**	3	**Group #**		
References		EMG-SP28		EOP Users Guide		

Explanation:

The plant was at rated power when an event occurred. The provided Heat Removal/Core Cooling printout, used to assess adequate core cooling, shows the following: 1) 5 RPV water level indicators show upscale and that flashing is occurring in the reference legs and 2 level indicators are off; 2) RPV pressure is currently 600 psig; 3) neither core spray nor feedwater are currently injecting; 4) the current cooldown rate is 75 °F/hr.

From the reference provided, it can be seen that all Yarway and Gemac RPV water level indicators are in the bad region of the saturation curve and should not be used to determine RPV water level. This condition would result in an artificially high indicated RPV water level, as is shown on the provided handout. With these indicators inoperable and the fuel zone indicators off, there is currently no reliable RPV water level indicators and that entry into RPV Flooding – No ATWS is required (since no indications point toward an ATWS). Answer B is correct.

The data shows that RPV water level is high and could be due to the injection of Core Spray. Core Spray, either automatically initiated or manually initiated, can only inject when RPV is < 310 psig. From the graph, it shows that RPV pressure is $\geq$ 500 psig and core spray cannot be injecting. Answer A is incorrect.

The TS cooldown rate limit is 100 °F/hr and the current cooldown rate is only 75 °F/hr. Thus, the TS limit is not exceeded. Answer B is incorrect.

The data shows that RPV pressure is lowering. The Isolation Condensers automatically initiate on RPV low-low water level or RPV high pressure. Since the date shows only high water level and no

	indications of what water level was before, it cannot be determined from only the provide data that IC have auto initiated on RPV water level. The pressure graph shows a constant normal pressure up until the event, then a lowering pressure. Therefore, the ICs could not have auto initiated on RPV high pressure. Answer C is incorrect.

References to be provided during exam:	EMG-SP28	

Learning Objective	2621.845.0.0059 LO 3099 Using procedure EMG-3200.08A or .08B, evaluate the technical basis for each step in the procedure, and apply this evaluation to determine the correct course of action under emergency conditions.

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPR

10 CFR Part 55 Content:	**55.41**	7	**55.43**		

Time to Complete: 1-2 minutes

Question 75 **1 Point**

The plant was at rated power when an event occurred requiring the SM to declare an Unusual Event emergency classification. **NO** emergency response facilities have been activated.

You have filled the role as the Shift Communicator. IAW EP-AA-112-100-F-05, Mid-Atlantic Shift Communicator (CR) Checklist, which of the following are you responsible for?

A. Notifying the NJ OEM using the Auto Ring phone

B. Notifying the NRC using the Health Physics Network

C. Reviewing an NRC Event Notification Form prior to transmittal

D. Establishing/maintaining communications with the TSC and EOF using the Operations Status Line

Question # Answer	75 A	Question Developer Initials/Date: NTP 3/7/09

Knowledge and Ability Reference Information						RO	SRO
Emergency Procedures/Plan 2.4.39 Knowledge of RO responsibilities in emergency plan implementation.					Importance Rating	3.9	3.8
Level	**RO**	**Tier #**	**3**	**Group #**			
References		EP-AA-112-100-F-05		EP-MA-114-100			
Explanation:	The Shift Communicator Checklist, EP-AA-112-100-F-05, directs that the Shift Communicator perform state/local notifications IAW EP-MA-114-100. After reviewing the completed State/Local Notification Form provided by the Shift ED, the Shift Communicator will notify the NJ EOM (New Jersey Office of Emergency Management) of the data contained in the State/Local Notification Form. Answer A is correct. The Shift Communicator might communicate with the NRC but through the HPN line. Answer B is incorrect. The Shift ED will complete the NRC Event Notification Form and there is no requirement that the Shift Communicator review it (as they would review the State/Local Notification Form). Answer C is incorrect. During an Alert or higher, the Operations Communicator establishes communication with the TSC and EOP – not the Shift Communcator. Answer D is plausible but incorrect.						
References to be provided during exam:	None						
Learning Objective	G-105-DBIG-CT1 LO G-105-DBIG-02 List the responsibilities of the Shift Communicator to include: 1) monitoring plant conditions; 2) Control Room, TSC, & EOF interface.						

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:P	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**	10	**55.43**			
Time to Complete: 1-2 minutes						

Question 1 **1 Point**

The plant was at rated power when the Operator reported that Drywell pressure indicated 2.4 psig and rising rapidly and a manual scram was inserted. All IMMEDIATE OPERATOR ACTIONS of ABN-1, Reactor Scram, were completed.

One minute later, the following annunciator alarmed:

- CONTROL AIR PRESS LO

The Operator reported that all air compressors are running and that INST AIR SUPPLY PRESS indicated 22 psig and lowering rapidly.

Two minutes later, the current plant conditions were as follows:

- RPV water level is 61" and lowering
- RPV pressure is 420 psig and lowering
- Drywell pressure is 9.2 psig and rising slowly
- INST AIR SUPPLY PRESS indicates 0 psig

With **ONLY** the information provided, which of the following actions shall the SRO direct?

A. Lineup and initiate Drywell Sprays IAW Support Procedure 29, Initiation of the Containment Spray System for Drywell Sprays

B. Rapidly depressurize the RPV with the Isolation Condensers and inject into the RPV with Core Spray, IAW the RPV Control – No ATWS EOP

C. Start all available Feedwater Pumps and use the MFRV controllers to maximize injection into the RPV, IAW ABN-1, Reactor Scram

D. Rapidly depressurize the RPV with the Turbine Bypass Valves and inject into the RPV with Core Spray, IAW the RPV Control – No ATWS EOP

Question # Answer	1 B	Question Developer Initials/Date: NTP 1/6/09

Knowledge and Ability Reference Information						RO	SRO
295019 Partial or Total Loss of Inst. Air AA2.01 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR : Instrument air system pressure					Importance Rating	3.5	3.6
Level	**SRO**	**Tier #**	**1**	**Group #**	**1**		
References		RPV Control – No ATWS EOP		ABN-35		Primary Containment Control EOP	

Explanation:

The plant was at rated power when indications of a LOCA occurred. Following the manual scram, all immediate operator actions are performed, which includes tripping 2 feedwater pumps, placing all MFRVs in manual and closing them. After the scram, all instrument air is lost, and RPV water level has dropped to 61", with a Drywell pressure of 9.6 psig. With no instrument air supply, no MFRVs can be controlled by the panel operator, and thus besides CRD and possibly SLC, there is no other high pressure RPV injection source. Answer C is incorrect.

The given conditions state that RPV water level continues to lower. The override in the pressure leg of RPV Control – No ATWS EOP states, that if RPV water level cannot be maintained by high pressure systems and low pressure systems are capable of maintaining water level, then lower RPV water level as necessary to allow low pressure injection systems to inject (exceeding the TS cooldown rate is allowed). Depressurizing the RPV with the turbine bypass valves is not possible since the outside MSIVs have closed on loss of air, but the ICs are available and can be used for this purpose. Answer B is correct and answer D is incorrect.

Because no Drywell temperature is provided, the operator cannot verify that parameters are within the containment spray initiation limit (CSIL) curve. Because the Operator cannot verify the plant is within CSIL, the SRO cannot direct Drywell Sprays from the Primary Containment Control EOP, Drywell Temperature leg. Also, spraying the Drywell from the Primary Containment Control EOP, Drywell Pressure leg requires that Drywell/Torus pressure be > 12 psig to

	initiate DW sprays. Answer A is incorrect.					
References to be provided during exam:	None					
Learning Objective	2621.845.0.0052 3055 Given a copy of RPV Control – No ATWS, describe in detail each step or conditional statement, including technical basis, and how to perform each step as required					
Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPR
10 CFR Part 55 Content:	**55.41**		**55.43**	**5**		
Time to Complete: 2-3 minutes						

Question 2 **1 Point**

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

- FIRE PUMP 1 RUNNING
- FIRE PUMP 2 RUNNING

An EO notifies the Control Room of black smoke in the vicinity of the Core Spray Booster Pumps NZ03A and NZ03C, and that fire suppression has actuated.

One minute later, the following annunciators alarmed:

- EMRV OPEN
- SV/EMRV NOT CLOSED

The Operator reports that the **RED** light is **ON** for EMRV NR108C and Torus water temperature indicates 85 °F and rising slowly.

Which of the following actions shall the SRO direct? (**See attached**)

A. Pull fuse 16F301C for EMRV NR108C IAW ABN-40, Stuck Open EMRV.

B. Scram the reactor IAW FSP-RB1D, Fire Support Procedure for RB 51' Elevation.

C. Place the Control Room HVAC System in the PART RECIRC mode IAW ABN-29, Plant Fires

D. Initiate Torus Cooling IAW Support Procedure 25, Initiation of the Containment Spray System in the Torus Cooling Mode.

ATTACHMENT 101.2-3
(continued)
TABLE 1

FIRE DETECTION INSTRUMENTATION

Fire Area/Zone	Location	Detection Zone	Required # of Detectors
RB-FZ-1A	Rx. Bldg. 119' elev	Sprinkler Sys. #10	1 (WFS)
RB-FZ-1B	" 95' "	NA	24*
RB-FZ-1C	" 75' "	NA	22*
	" 75' "	Sprinkler Sys. #11	1 (WFS)
RB-FZ-1D	" 51' "	RK01/RK02	2
	" 51' "	1 – North	6+
	" 51' "	2 – North	7+
	" 51' "	1 – South	6+
	" 51' "	2 - South	6+
RB-FZ-1G	" 38'/51' "	Shutdown Pump Rm	7
RB-FZ-1E	" 23' "	1 – North	7+
	" 23' "	2 – North	6+
	" 23' "	1 – South	6+
	" 23' "	2 - South	6+
RB-FZ-1F	" 19' "	NA	4 (1 per corner room)
TB-FA-3A	4160 Swgr. Rm.	Vault "C"	1
TB-FA-3B	"	Vault "D"	1
TB-FZ-11C	"	Gen. Area	5+
TB-FA-26	"	"C" Battery Rm.	1
OB-FZ-4	Cable Spread Rm.	4A-Zone 1	3+
	"	4A-Zone 2	3+
	"	4A-Zone 3	4+
	"	4A-Zone 4	5+

Question # Answer	2 B	Question Developer Initials/Date: NTP 1/7/09

Knowledge and Ability Reference Information						RO	SRO
600000 AA2.13 Ability to determine and interpret the following as they apply to PLANT FIRE ON SITE: Need for emergency plant shutdown					Importance Rating	3.2	3.8
Level	**SRO**	**Tier #**	**1**	**Group #**	**1**		
References		101.2		ABN-29 ABN-40	FSP-RB1D		

Explanation:

The plant is at rated power when an event causes the fire pumps to auto start. The control room is then notified of black smoke and fire suppression actuation in the vicinity of the Core Spray Booster Pumps NZ03A & NZ03C, which are located on RB 51' north. Taken together, one can conclude there is a fire in the Reactor Building elevation 51'. Moments later, indications of an open EMRV are received. The attached procedure section allows the Candidate to associate fire area RB-FZ-1D with the entry condition into FSP-RB1D. IAW FSP-RB1D, the prompt manual actions for these conditions is to scram the reactor. Answer B is correct.

ABN-40, Stuck Open EMRV, provides direction to close the open EMRV (answer A). The first method to close an open EMRV is with the associated control switch, then disable the EMRV if it is still open. Pulling fuses is directed in ABN-30, Control Room Evacuation Answer A is incorrect.

Placing the Control Room HVAC in the PART RECIRC mode will maintain a positive pressure in the Control Room, which would keep any smoke from entering the Control Room. ABN-29 does not require this action. Answer C is incorrect.

Initiating torus cooling IAW the support procedure could be a response except the torus temperature is currently below the entry condition for the Primary Containment Control EOP, which directs the support procedure, and thus the EOP support procedures are not entered. Answer D is incorrect.

References to be provided during exam:	FSP-RB1D	

Learning Objective	2621.828.0.0019 LO 286-10450 Describe and interpret procedure sections and steps for plant emergency or off-normal conditions that involve this system including personnel allocation and equipment operation in accordance with applicable ABN, SDRP, EOP, EOP Support Procedures, and EPIPs.

Question Source	**Bank**		**Modified Bank**	X	**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPR
10 CFR Part 55 Content:	**55.41**		**55.43**	5		
Time to Complete: 2-3 minutes						

Question 3 **1 Point**

The plant was starting up after an outage. Present plant conditions are as follows:

- RPV pressure indicates 1000 psig
- RPV water level is 165"
- 2 Turbine Bypass Valves indicate RED light ON
- The REACTOR MODE SELECTOR switch is in RUN

The Operator reports that **ALL** Turbine Bypass Valves are changing to the **OPEN** position and 1 minute later, the reactor automatically scrams while the Operator is controlling RPV water level.

Which of the following states a reactor scram signal in this event and the Tech Spec (TS) bases for the scram signal?

	Scram Signal	TS Bases for Scram Setpoint
A.	APRM downscale	To minimize the possibility of exceeding the fuel clad safety limit
B.	IRM upscale	To minimize the possibility of exceeding the fuel clad safety limit
C.	MSIV position	To prevent a fast RPV depressurization and resultant rapid cooldown
D.	MSIV position	To anticipate the pressure and flux transients which occur during normal or inadvertent MSIV closure

Question # Answer	3 D	Question Developer Initials/Date: NTP 1/7/09

Knowledge and Ability Reference Information						RO	SRO
295006 AA2.06 Ability to determine and/or interpret the following as they apply to SCRAM : Cause of reactor scram					Importance Rating	3.5	3.8
Level	**SRO**	**Tier #**	**1**	**Group #**	**1**		

References	TS 2.3		

Explanation:	The plant is starting up (Mode switch in RUN) with 2 TBVs open, when all TBV go open, and the plant scrams. As the TBVs open, RPV pressure will lower until it reaches 850 psig. At this point, all MSIVS close to minimize the cooldown and the plant will scram from MSIV position. TS 2.3 Bases provides the following: a scram on 10% main steam isolation valve (MSIV) closure anticipates the pressure and flux transients which occur during normal or inadvertent isolation valve closure. Answer D is correct. As the RPV depressurizes, water will flash to steam adding negative reactivity which will be displayed as lowering APRMs. Downscale APRMs by themselves, only provide a rodblock – not a scram. An upscale IRM with an associated APRM downscale can cause a scram signal, but as stated, the IRMs would not be a high state prior to the event, and the void formation would only drive power indications downward. Answer A is incorrect. Upscale IRMs can cause a scram signal to prevent loss of margin to the fuel clad safety limit, but not when the mode switch is in run. Answer B is incorrect. The bases provided in answer C is the bases for the MSIV closure on low RPV pressure (850 psig) – not why the reactor scrammed on MSIV position. Answer C is incorrect.

References to be provided during exam:	None	

Learning Objective	2621.850.0.0090 LO 01920 Given various plant indications (and their values) or copies of Control Room/Plant logs, evaluate the indications to determine plant status with respect to the Operating License and Technical Specifications.

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**		**55.43**	**2**		
Time to Complete: 1-2 minutes						

Question 4 **1 Point**

The plant was at rated power when an event occurred, as shown on the timeline below:

0900 USS 1B2 trips

0910 Generator trips, reactor scram signal

0911 The Operator reports indications of an ATWS

0913 An EO is directed by the Control Room to perform Support Procedure actions in the plant

0917 SM declares an Alert emergency classification

0936 **ALL on-site** emergency response facilities are **ACTIVATED** and have assumed command and control functions

0938 The EO notifies the Control Room that a small quantity of contaminated water was spilled while completing his tasks and requests assistance from Radiation Protection (RP)

IAW EP-AA-112, Emergency Response Organization (ERO)/Emergency Response Facility (ERF) Activation and Operation, which of the following states how the SM shall request RP assistance?

The SM requests the assistance to the ….

A. TSC.

B. OSC.

C. EOF.

D. OCC.

Question # Answer	4 A	Question Developer Initials/Date: NTP 1/7/09

Knowledge and Ability Reference Information						RO	SRO
295037 SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown 2.4.37 Knowledge of the lines of authority during implementation of the emergency plan					Importance Rating	3.0	4.1
Level	SRO	**Tier #**	1	**Group #**	1		
References		EP-AA-112		EP-AA-112-200			
Explanation:	The given conditions show that a scram condition is present but that the reactor is not shutdown. An EO is directed to perform in-plant action to facilitate insertion of control rods. The conditions also show that an emergency is declared and that all on-site emergency response facilities (TSC and OSC) are activated and have assumed command and control of the emergency. In this condition, the SM is no longer the emergency director. When the SM requires assistance from plant personnel, the SM makes this request to the TSC, which will then direct the personnel from the OSC. Answer A is correct and answers B and C are incorrect. During non-emergency upset conditions, the Operations Command Center (OCC) is staffed to provide additional support for the upset condition. The TSC provides this function during a declared emergency. Answer D is incorrect.							
References to be provided during exam:	None						
Learning Objective	G-101 DBIG-CT1 LO G-101-DBIG-04 State the command and control turnover requirements of the Station Emergency Director or Corporate Emergency Director.						

Question Source	Bank		Modified Bank		New	X
Question Cognitive Level:	Memory or Fundamental Knowledge		X 1:P	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41		55.43	1		
Time to Complete: 1-2 minutes						

Question 5 **1 Point**

The plant was operating at rated power with 5 Recirculation Loops.

IAW Tech Specs 6.7 and Tech Specs Section 2:

1. Which of the following events will require that a Safety Limit Violation Report be generated?
2. Which of the following states the **MAXIMUM** amount of time from the violation, to submit the Safety Limit Violation Report to the NRC?

	1. Event	2. MAXIMUM AMOUNT OF TIME
A.	RPV pressure peaked at 1276 psig	10 days
B.	RPV water level lowered to 52" TAF	10 days
C.	MCPR lowered to 1.09	3 days
D.	APRMs indicated 106% and **NO** automatic scram occurred	3 days

Question # Answer	5 B	Question Developer Initials/Date: NTP 1/8/09

Knowledge and Ability Reference Information						RO	SRO
295031 Reactor Low Water Level 2.4.30 - Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.					Importance Rating	2.7	4.1
Level	**SRO**	**Tier #**	**1**	**Group #**	**1**		
References		TS 2.1.D		TS 6.7			
Explanation:	There are several safety limits, when violated, require the generation and submission of a Safety Limit Violation Report: RPV pressure exceeds 1375 psig (with irradiated fuel in the RPV), when RPV pressure is > 800 psig and core flow is > 10%, MCPR is < 1.10 for 5 loop operation; RPV water level is < 4' 8" above TAF; If an LSSS is exceeded and a scram is not initiated by the protective instrumentation, an analysis must be performed to verify that a safety limit is not exceeded. When a safety limit violation does occur, the Safety Limit Violation Report shall be submitted to the Commission within 10 days of the violation. Answer B meets both the event criteria and the time requirement and is correct. Answer B is correct. Answer A is incorrect since the pressure is incorrect but the Candidate may confuse the pressure setpoint as 1275 psig. Answer C has the correct event, but has the incorrect time. Answer C is incorrect. The parameters provided in answer D will not result in a scram since the scram setpoint is above the value given. Answer D is incorrect.						
References to be provided during exam:	None						
Learning Objective	2621.850.0.0090 LO 01920 Given various plant indications (and their values) or copies of Control Room/Plant logs, evaluate the indications to determine plant status with respect to the Operating License and Technical Specifications.						

Question Source	Bank		Modified Bank		New	X
Question Cognitive Level:	Memory or Fundamental Knowledge		X 1:D	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41		55.43	2		
Time to Complete: 1-2 minutes						

Question 6 **1 Point**

The plant is in cold shutdown and is cooling down with the Shutdown Cooling System (SDC). The following conditions currently exist:

- RECIRC PUMP SUCTION TEMPS indicates 209 °F
- The Primary Containment is still inerted
- RPV water level is 175" and steady

An event then occurs as shown in the timeline below:

0800 Annunciator RBCCW – SURGE TANK LVL HI/LO alarms

0804 The EO reports the RBCCW Surge Tank indicates 1" and lowering and the Tank makeup valve is full open

0806 The Radwaste Operator reports RB Floor Drain Sump 1-7 high level is in alarm

0808 Maintenance reports that they are unable to quickly mitigate the event

0809 The SM observes Drywell pressure at 1.7 psig and steady and Drywell temperature at 140 °F and steady

0810 The SM starts the 1-hour clock to monitor entry into EAL MA5(1) **(SEE ATTACHED)**

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

A. Trip all Recirculation Pumps IAW ABN-19, RBCCW Failure Response.

B. Operate all available Drywell Coolers, IAW SP-27, Maximizing Drywell Cooling.

C. Isolate the Reactor Water Cleanup System IAW the Secondary Containment Control EOP.

D. Initiate Isolation Condensers by placing the Condensate Return DC valves to OPEN, IAW 307, Isolation Condenser System.

Insert EAL Cold Matrix from EP-AA-1010, page OCGS 3-21 here.

Question # Answer	6 A	Question Developer Initials/Date: NTP 1/8/09

Knowledge and Ability Reference Information						RO	SRO
295018 Partial or Total Loss of CCW 2.1.23 - Ability to perform specific system and integrated plant procedures during all modes of plant operation.					Importance Rating	4.3	4.4
Level	SRO	**Tier #**	1	**Group #**	1		
References		EP-AA-1010		ABN-3		ABN-19	

Explanation:

The plant is < 212 °F and cooling down with SDC with all 3 SDC pumps in service. Then, indications are provided which show an unisolable leak in RBCCW (lowering surge tank level and high level in the floor drain tank, and not corrected quickly). Some time later, the SM starts the 1-hour clock for entry into emergency EAL MA5(1). This EAL entry shows that RPV temperature is > 212 °F for at least 1 hour. Therefore, RPV temperature has reached 212 °F and is rising due to the lack of RBCCW cooling to SDC. With the RBCCW leak and RPV water temperature > 212 °F, the RBCCW ABN directs that all recirculation pumps be tripped. Answer A is correct.

Operation of the Drywell coolers IAW SP-27 is directed from the Primary Containment Control EOP. Conditions show parameters less than the entry conditions (DW temperature & pressure) for the EOP. Thus, the ABN cannot be used. Answer B is incorrect.

With a loss of RBCCW, it is suggested that RWCU be removed from service. The RB floor drain sump 1-7 is an entry into the Secondary Containment Control EOP. In the Secondary Containment Control EOP, it directs isolation of leaking systems, which in this case, is RBCCW – not RWCU. Thus isolation/removal of RWCU is directed from the loss of RBCCW ABN and not the EOP. Answer C is incorrect.

Since the RPV has lost its cooling medium and is heating up, Isolation Condensers can used now that RPV temperature is > 212 °F. But with RPV water level > 160", initiation per the normal procedure is not allowed. Answer D is incorrect.

References to be provided during exam:	TQ-AA-1010 EAL Cold Matrix; page 3-21 inserted after the question	

Learning Objective	2621.828.0.0035 LO 00061 Using the procedure, identify and explain normal and emergency operations of the RBCCW System.

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X **2:RI**
10 CFR Part 55 Content:	**55.41**		**55.43**	**5**		
Time to Complete: 2-3 minutes						

Question 7 **1 Point**

The plant was at power when the following annunciators alarmed:

- RPS MG SET 1 TRIP
- VLDP-1 PWR XFR

The Operator reports that CRD Pump A is running.

Which of the following actions shall the SRO direct?

A. Declare Battery B inoperable IAW ABN-45, Loss of USS 1A2

B. Declare Battery C inoperable IAW ABN-50, Loss of VMCC 1A2

C. Declare V-14-31, DC Steam Inlet to Isolation Condenser A, IAW ABN-51, Loss of VMCC 1B2

D. Declare V-14-33, DC Steam Inlet to Isolation Condenser B, IAW ABN-53, DC Bus A and Panel Failures

Question # Answer	7 B	Question Developer Initials/Date: NTP 1/8/09

Knowledge and Ability Reference Information						RO	SRO
295004 Partial or Total Loss of DC Pwr AA2.03 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER : Battery voltage					Importance Rating	2.8	2.9
Level	**SRO**	**Tier #**	**1**	**Group #**	**1**		
References	ABN-50						

Explanation:	The provided annunciators show that the RPS MG Set 1 has tripped and that Panel VLDP-1 has transferred to its alternate power supply. The common supply to both these loads is 460 VAC VMCC 1A2. The power supply to VMCC 1A2 is USS 1A2. Therefore, either the loss of USS 1A2, which also de-energizes VMCC 1A2, or the loss of VMCC 1A2 by itself, would result in the annunciators provided. But, the Operator reports in the stem that CRD Pump A is running which is powered from USS 1A2. Therefore, USS 1A2 is still energized and only VMCC 1A2 is lost. VMCC 1A2 also provides power to both Battery Bus C chargers C1 and C2, and with the loss of VMCC 1A2, both chargers are gone. This will result in a discharge of Battery C and a reduction in Battery Bus C bus voltage. IAW ABN-50 (which shall be entered), and ABN-45 (which is not entered), Battery C shall be declared inoperable. Answer B is correct and answer A is incorrect since it states the incorrect procedure. The valves listed in answers C & D will also be declared inoperable, depending on which AC bus is lost (USS/VMCC 1A2 or USS/VMCC 1B2). But the ABNs listed are the incorrect ABNs.
References to be provided during exam:	None
Learning Objective	2621.828.0.0012 LO 263-10450 Describe and interpret procedure sections and steps for plant emergency or off-normal conditions that involve this system including personnel allocation and equipment operation in accordance with applicable ABN, SDRP, EOP, EOP Support Procedures, and EPIPs.

Question Source	**Bank**		**Modified Bank**	X	**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**		**55.43**	**5**		
Time to Complete: 1-2 minutes						

Question 8 **1 Point**

The plant was at rated power with I&C performing Lo-Lo RPV water level channel functional testing.

Due to a test error, a Lo-Lo RPV water level signal was simultaneously initiated in **ALL** RPS channels.

Current plant conditions were as follows:

- RPV water level dropped to 115" and has recovered to 186" and steady
- RPV pressure indicates 975 psig and lowering slowly
- Primary Containment parameters are normal

Which of the following methods shall the SRO direct to initiate a cooldown?

A. Open the EMRVs IAW SP-12, Alternate Pressure Control Systems - EMRVs

B. Open the Main Turbine Bypass Valves IAW the RPV Control – No ATWS EOP

C. Open the Isolation Condenser Vents IAW SP-15, Alternate Pressure Control Systems – IC Tube Side Vents

D. Open the RWCU Letdown Flow Controller IAW SP-14, Alternate Pressure Control Systems – Cleanup in Letdown Mode

Question # Answer	8 A	Question Developer Initials/Date: NTP 1/8/09

Knowledge and Ability Reference Information						RO	SRO
295020 Inadvertent Cont. Isolation AA2.04 - Ability to determine and/or interpret the following as they apply to INADVERTENT CONTAINMENT ISOLATION : Reactor pressure					Importance Rating	3.9	3.9
Level	SRO	**Tier #**	1	**Group #**	2		
References		EMG-SP12		RPV Control – No ATWS EOP			
Explanation:	The plant is at rated power when a lo-lo RPV water level signal (86") is initiated in all RPS channels. When a lo-lo RPV water level signal is initiated, the MSIVs, RWCU isolation valves, and Isolation Condenser vent valves (these are all primary containment isolation valves) go closed, and the reactor scrams. None of these isolations are bypassed in the RPV Control – No ATWS EOP. Therefore, with the MSIVs closed, the turbine bypass valves cannot be used. Answer B is incorrect. The IC tube vents cannot be used for 2 reasons: 1) they have isolated on the lo-lo RPV water level signal; and, 2) SP-15 only allows use of the vents as long as the ICs are not required to be isolated. At an RPV water level of 181", the EOP requires that the ICs be isolated. Answer C is incorrect. Re-establishing RWCU can be accomplished through the use of SP-14 (currently RWCU is isolated from the lo-lo RPV water level signal). But just by opening the letdown flow controller, with the isolation valves closed, does not create a cooldown path for the RPV. Answer D is incorrect. From the conditions given, there is no impediment to using the EMRVs for cooldown, other than verifying Torus water level > 90" (normal value is 150". Answer A is correct.							
References to be provided during exam:	None						
Learning Objective	2621.845.0.0052 LO 3055 Given a copy of RPV Control – No ATWS, describe in detail each step						

	or conditional statement, including technical basis, and how to perform each step as required.					
Question Source	**Bank**		**Modified Bank**	X	**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**		**55.43**	5		
Time to Complete: 1-2 minutes						

Question 9 **1 Point**

The plant was at rated power when a Control Room evacuation was declared (**NOT** due to a fire). **ALL** SUBSEQUENT OPERATOR ACTIONS of ABN-30, Control Room Evacuation, were completed prior to evacuating.

ALL required Shutdown Panels have been activated IAW ABN-30, Control Room Evacuation.

Current plant conditions are as follows:

- All control rods are inserted
- RPV pressure indicates 1050 psig and lowering slowly
- RPV water level is 150"
- Torus water level is 151"
- Drywell pressure is 2.8 psig
- Offsite power is supplying the station
- Chemistry reports that Primary Containment Hydrogen is 0.5%

Which of the following actions shall the SRO direct to the RO?

A. Manually trip all Feedwater Pump breakers locally IAW ABN-30, Control Room Evacuation

B. Vent the Drywell due to hydrogen concerns IAW the Primary Containment Control EOP

C. Maintain RPV pressure < 1045 psig with Isolation Condenser B IAW the RPV Control – No ATWS EOP

D. Confirm ALL Recirculation Pump Discharge and Suction Valves closed IAW ABN-30, Control Room Evacuation

Question # Answer	9 C	Question Developer Initials/Date: NTP 1/9/09

Knowledge and Ability Reference Information						RO	SRO
295007 High Reactor Pressure 2.4.34 - Emergency Procedures / Plan: Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.					**Importance Rating**	4.2	4.1
Level	SRO	**Tier #**	1	**Group #**	2		
References		ABN-30		RPV Control – No ATWS EOP			

Explanation:

The plant is at power when an evacuation becomes required. Some of the SUBSEQUENT OPERATOR ACTIONS of ABN-30 include the following: scram, turbine trip, close MSIVs, trip recirculation pumps, trip feedwater and condensate pumps.

The RPV pressure leg of the RPV Control – No ATWS EOP directs that RPV pressure be maintained < 1045 psig with the turbine bypass valves, and can be augmented with the Isolation Condensers, EMRVs and RWCU. Isolation Condenser B is the only pressure control method at the Remote Shutdown Panel. Answer C is correct.

ABN-30 does provide a backup method to trip all Feedwater Pumps locally at the breakers, but this is performed only if the pumps could not be tripped in the Control Room prior to evacuating. The question stem states that all subsequent operator actions, which includes tripping all Feedwater Pumps, has been accomplished. Answer A is incorrect.

There are venting methods, delineated in the Primary Containment Control EOP, to control primary Containment hydrogen. But the value of hydrogen provided in the question stem, is less than the value for entering the Primary Containment Control EOP of 1.5%. Answer B is incorrect.

There are numerous actions performed in the Control Room prior to evacuation and in the plant IAW ABN-30. These include tripping all recirculation Pumps or manually in the plant if required. ABN-30 specifically says to ensure at least one Recirculation Pump suction/discharge valve remains open. If the Candidate gets confused with the components tripped and isolated during the

	evacuation, this is a plausible response. Answer D is incorrect.					
References to be provided during exam:	None					
Learning Objective	2621.845.0.0052 LO 3055 Given a copy of RPV Control – No ATWS, describe in detail each step or conditional statement, including technical basis, and how to perform each step as required.					
Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**		**55.43**	**5**		
Time to Complete: 1-2 minutes						

Question 10 **1 Point**

The plant was at rated power when indications and local reports confirmed an earthquake has just occurred.

The US directs the EOs to conduct a visual inspection of their areas for damage.

5 minutes later, the following events occur:

- TORUS LEVEL HI/LO annunciator alarms
- The Operator reports that TORUS LEVEL WIDE RANGE indicates 139" and lowering
- The EO calls the Control Room and reports flooding in the NW RB corner room from a Core Spray Pump line break, and that water level in the room is above the MAX SAFE value

At the direction of the US, the Operator closes the Core Spray Pumps A/C suction valves and Torus water level stabilizes at 135".

Which of the following actions shall the SRO direct?

A. Manually scram the reactor, IAW ABN-38, Station Seismic Event

B. Perform a rapid power reduction, IAW the Primary Containment Control EOP

C. Initiate a manual reactor shutdown, IAW the Primary Containment Control EOP

D. Emergency Depressurize the RPV, IAW the Secondary Containment Control EOP

Question # Answer	10 A	Question Developer Initials/Date: NTP 1/9/09

Knowledge and Ability Reference Information						RO	SRO
295036 Secondary Containment High Sump/Area Water Level 2.4.8 - Emergency Procedures / Plan: Knowledge of how abnormal operating procedures are used in conjunction with EOP's.					Importance Rating	3.8	4.5
Level	**SRO**	**Tier #**	**1**	**Group #**	**2**		
References	ABN-38						

Explanation:

The plant is at power when an earthquake occurs resulting in a core spray line break downstream of the core spray pump suction valve. A lowering torus water level and flooding in the NW RB Corner Room becomes evident. Two EOPs are entered – Primary Containment Control EOP, and Secondary Containment Control EOP. In the torus water level leg of the PCC EOP, a scram is required if torus water level cannot be maintained above 110". The leak is stopped at 135" (by closing the core spray suction valve). In the SCC EOP, it is necessary to recognize if a primary system is discharging into the secondary containment. In this case, it is not. The SCC EOP then directs a reactor shutdown if water level goes above the max safe value in 2 or more areas. In the question, only 1 area has flooding.

With flooding stopped at 135" and in only one area, the EOPs do not require either a scram or reactor shutdown. But ABN-38, Station Seismic Event, requires a reactor scram if: 1) the seismic event caused a spurious actuation; 2) directly resulted in the inoperability of any safety system or a system required to complete a safe shutdown; or, 3) can potentially affect the public safety. The break in the core spray suction line is a direct result in the loss of a safety system from the earthquake. Also, the torus leak itself was a result of the earthquake and this loss of primary containment integrity could potentially affect public health. Because of this, a manual reactor scram is required IAW the ABN, although not required by the EOPs. Answer A is correct.

A scram is required if a primary system is discharging into the reactor Building and flooding in 2 areas exceeds the max safe value, IAW the Secondary Containment Control EOP. If flooding not from a primary system exceeds the max safe value in 2 areas, then a reactor

	shutdown is required in the same EOP. An emergency Depressurization is required in the Primary Containment EOP if torus water level lowers to 110". The drywell vent header downcomers begin uncovered at this point and the primary containment suppression function is lost. All other answers are incorrect but plausible.					
References to be provided during exam:	None					
Learning Objective						
Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**		**55.43**	**5**		
Time to Complete: 1-2 minutes						

Question 11 **1 Point**

The plant is at rated power when the following annunciator alarmed (among others):

- IP-4A PWR LOST

After being dispatched, Electrical Maintenance reports that the breaker to IP-4A has sustained heavy damage and needs to be replaced.

Which of the following states the plant impact from the event, **AND** the required Tech Spec action?

	Plant Impact	**Required TS Action**
A.	IRMs 11-14 are inoperable	Place the plant in COLD SHUTDOWN within 24 hours (of the event start)
B.	Auto start of the Standby Gas Treatment System	Place the plant in COLD SHUTDOWN within 30 hours (of the event start)
C.	Main Steam Radiation Monitors fail downscale	Place the plant in COLD SHUTDOWN within 24 hours (of the event start)
D.	Reactor Manual Control is inoperable	Place the plant in COLD SHUTDOWN within 30 hours (of the event start)

Question # Answer	11 D	Question Developer Initials/Date: NTP 1/10/09

Knowledge and Ability Reference Information						RO	SRO
262002 UPS A2.01 - Ability to (a) predict the impacts of the following on the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Under voltage				Importance Rating		2.6	2.8
Level	**SRO**	**Tier #**	**2**	**Group #**	**1**		

References	TS 3.7	OP-OC-108-104-1001	RAP-9XF6b

Explanation:	The plant is at power when vital bus IP-4A experiences a loss of voltage. When this occurs, the reactor manual control system becomes inoperable. TS 3.7.A.1.c requires this bus to be energized to make the reactor critical. If the bus is lost while at power, TS 3.7.B requires that the plant be placed in cold shutdown (but does not specify a time). OP-OC-108-104-1001, Guidance for Limiting and Administrative Conditions for Operations, states in this case, the plant shall be placed in the cold shutdown within 30 hours. Answer D is correct. Answers A and C have both the incorrect plant impact (these impacts occur from other bus losses) and incorrect shutdown requirement. Answer B has the correct shutdown statement but the incorrect plant response to the loss of IP-4A.

References to be provided during exam:	TS 3.7	

Learning Objective	2621.850.0.0090 LO 01920 Given various plant indications (and their values) or copies of Control Room/Plant logs, evaluate the indications to determine plant status with respect to the Operating License and Technical Specifications.

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:F	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**		**55.43**	2		
Time to Complete: 1-2 minutes						

Question 12 **1 Point**

A plant startup was in-progress. The following conditions currently exist:

- RPV pressure is 925 psig
- 3 Turbine Bypass Valves are open
- The REACTOR MODE SELECTOR switch is in STARTUP
- All IRMs read between 25-35% on Range 10

A fault in the turbine control system resulted in the simultaneous closing of **ALL** Turbine Bypass Valves and the APRMs peaked at 39%. All systems then responded as designed.

Which of the following Limiting Safety System Settings (LSSS) were exceeded, if any, and the time requirement to notify the NRC from this event?

	LSSS Exceeded	**NRC Notification**
A.	None	None
B.	IRMs	4 hours
C.	APRMs	4 hours
D.	Reactor Low Water Level	8 hour

Question # Answer	12 B	Question Developer Initials/Date: NTP 1/10/09

Knowledge and Ability Reference Information						RO	SRO
215003 Intermediate Range Monitors (IRMs) A2.04 - Ability to (a) predict the impacts of the following on the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Upscale or downscale trips				Importance Rating		3.7	3.8
Level	**SRO**	**Tier #**	**2**	**Group #**	**1**		
References		LS-AA-1020, Table SAF		TS 2.3			
Explanation:	The reactor is starting up with the conditions given, when all turbine bypass valves go closed. This results in a suppression of voids and power rises to 41%. With the Mode Switch in Startup, IRM trips are in force. When power rose to 41% on the APRMS, the LSSS for IRMs of $\leq$ 38.4% was exceeded and a reactor scram occurred. IAW LS-AA-1020 Table SAF, any event that results in actuation of the reactor protection system (RPS) when the reactor is critical except when the actuation results from and is part of a pre-planned sequence during testing or reactor operation, requires a 4-hour notification to the NRC. Answer B is correct. The APRM LSSS is not exceeded. It is not known what RPV water level did from this low power scram and it may have been exceeded, as it does from a rated power scram, but the notification time is incorrect.						
References to be provided during exam:	LS-AA-1020, Table SAF						
Learning Objective	2621.850.0.0090 LO 01920 Given various plant indications (and their values) or copies of Control Room/Plant logs, evaluate the indications to determine plant status with respect to the Operating License and Technical Specifications.						

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPR
10 CFR Part 55 Content:	**55.41**		**55.43**	**2**		
Time to Complete: 1-2 minutes						

Question 13 **1 Point**

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

- **ALL** but 6 control rods indicate green backlight; the remaining 6 control rods indicate position 04
- RECIRC PUMP SUCTION TEMPS indicates 440 °F and lowering
- RPV water level indicates 134" and rising slowly
- Drywell pressure indicates 11 psig
- Drywell temperature indicates 225 °F
- Torus water temperature indicates 153 °F
- Torus water level indicates 160"

Which of the following actions shall the SRO direct? (**SEE ATTACHED**)

A. Initiate Liquid Poison IAW Support Procedure 22, Initiating the Liquid Poison System

B. Emergency Depressurize the RPV IAW the Emergency Depressurization – With ATWS EOP

C. Before RECIRC PUMP SUCTION TEMPS indicates about 425 °F, stop injection into the RPV from the Core Spray System, IAW the RPV Control – No ATWS EOP

D. Terminate and prevent RPV injection from sources external to the Primary Containment not required for adequate core cooling IAW the Primary Containment Control EOP

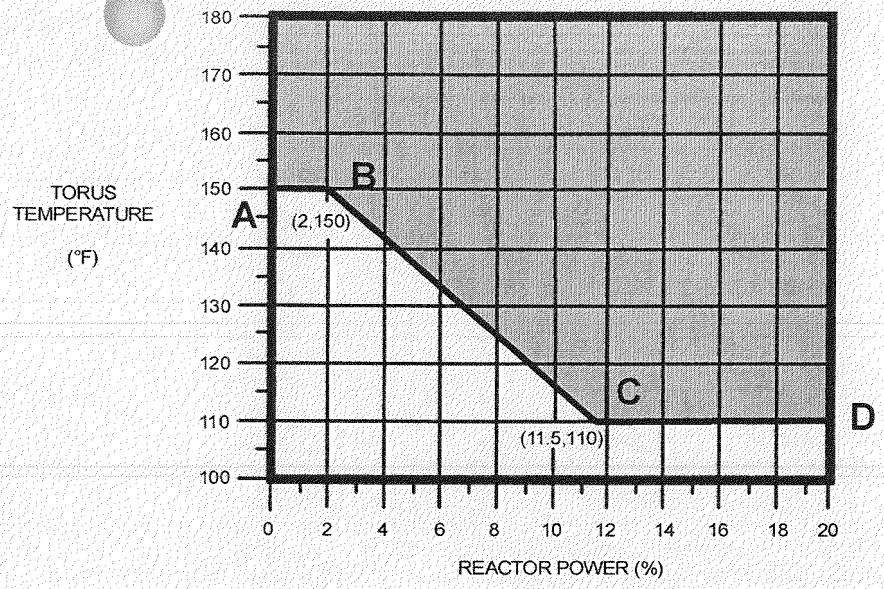
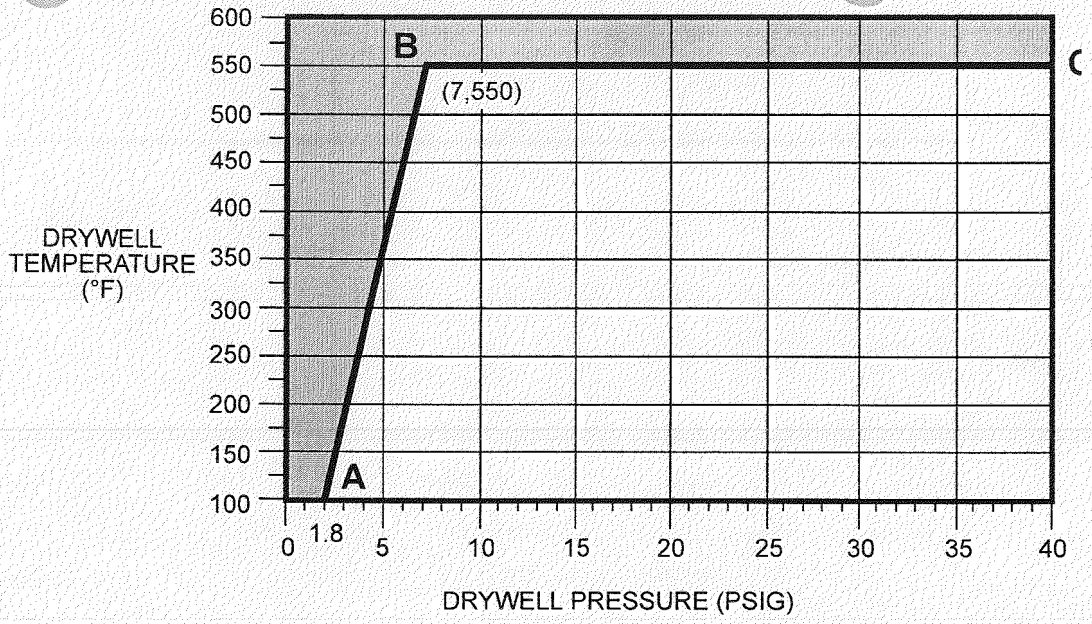
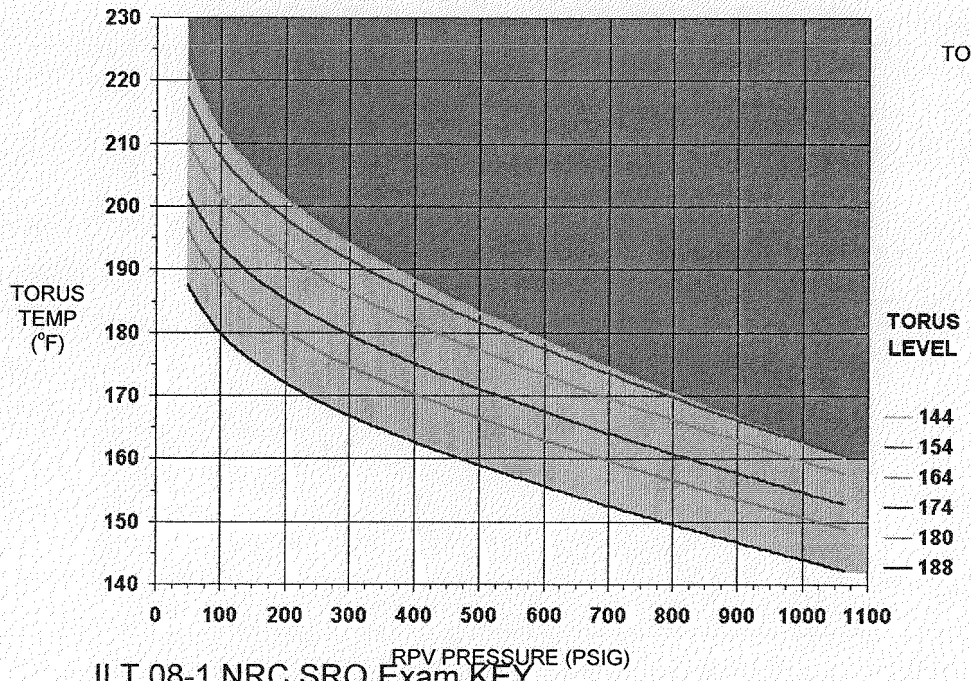
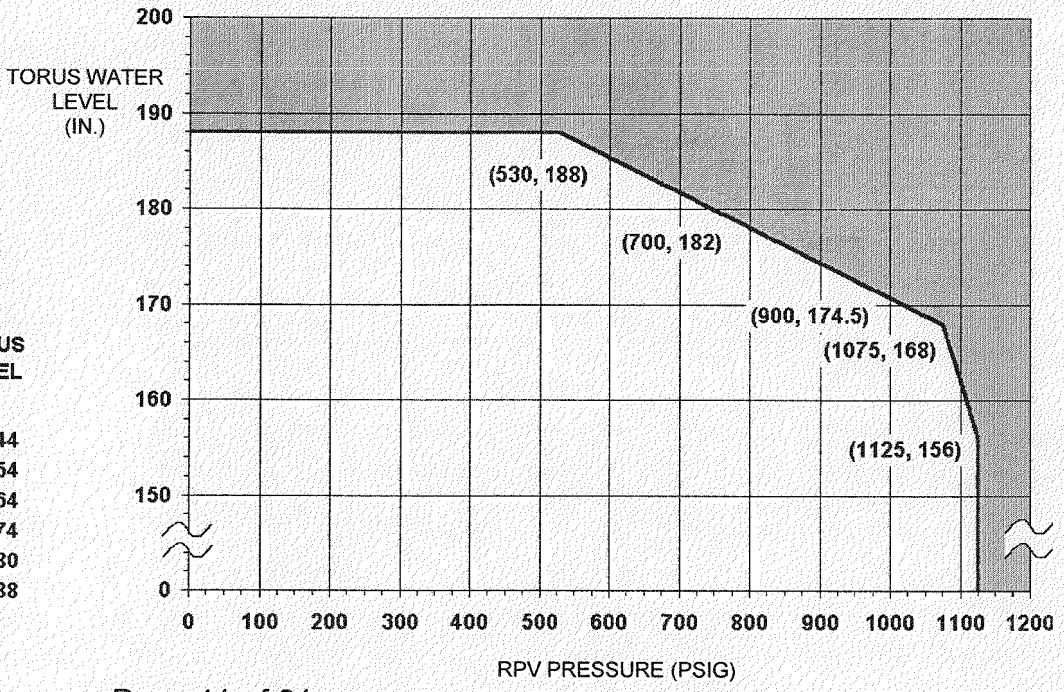


FIG.L BIIT
BORON INJECTION
INITIATION TEMPERATURE

CONTAINMENT SPRAY INITIATION LIMI



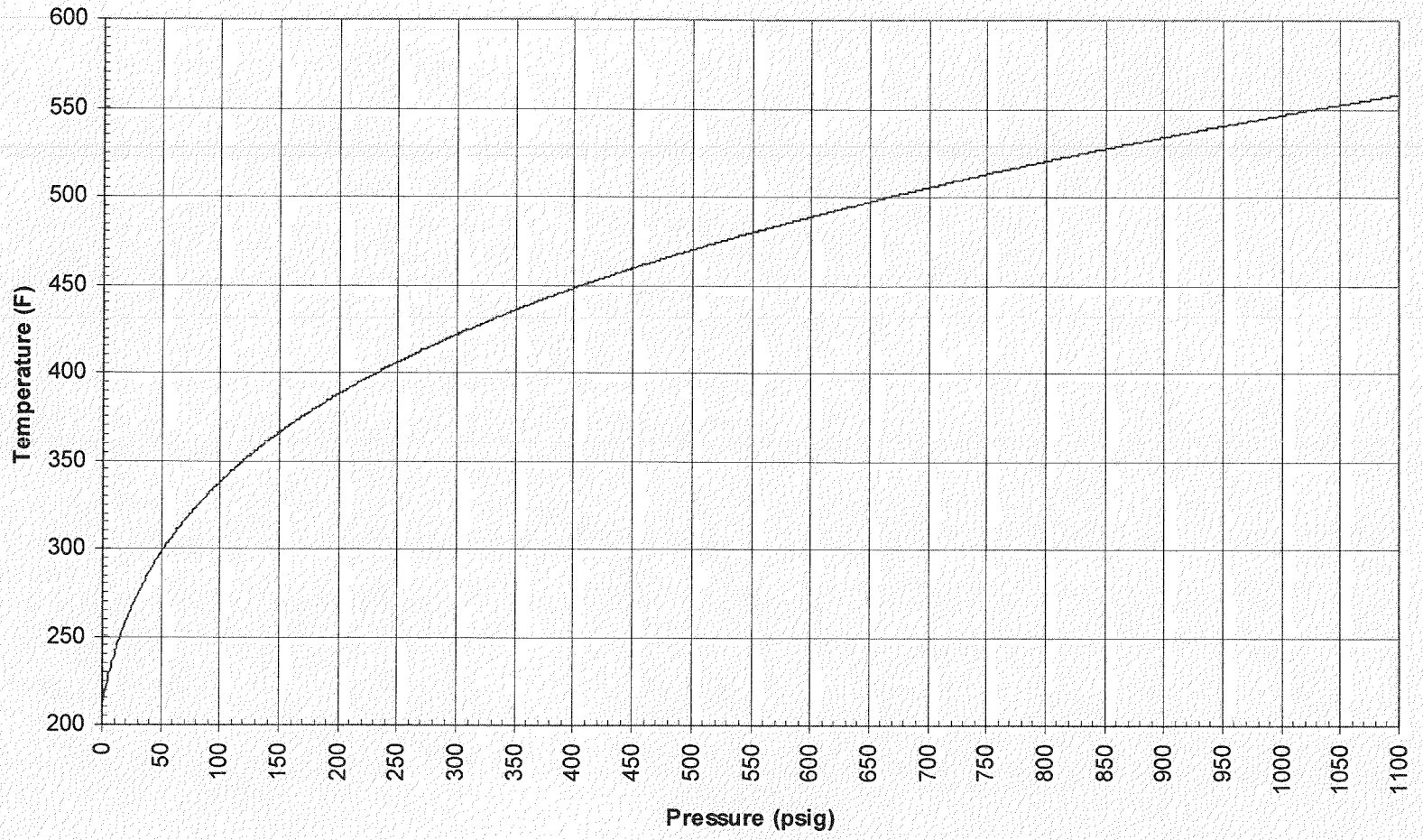




Heat Capacity Temperature Limit

Torus Load Limit

Saturated Steam



Question # Answer	13 C	Question Developer Initials/Date: NTP 1/12/09

Knowledge and Ability Reference Information						RO	SRO
209001 Low Pressure Core Spray 2.1.25 - Conduct of Operations: Ability to interpret reference materials, such as graphs, curves, tables, etc.					Importance Rating	3.9	4.2
Level	**SRO**	**Tier #**	**2**	**Group #**	**1**		
References		RPV Control – No ATWS EOP					

Explanation:

The plant was at power when an event occurred. The conditions provided require entry into the RPV Control – No ATWS and Primary Containment Control EOP. The recirculation pump suction temperature (which is trending down) shows that RPV pressure is about 375 psig and lowering. A note in the RPV Control – No ATWS EOP states that if Core Spray is running (which it is), then to secure Core Spray before RPV pressure drops to 310 psig (which equates to about 425 °F), as long as core cooling is assured. RPV water level is given as 134" and slowly rising; thus, adequate core cooling is assured. With this, and RPV pressure lowering, Core Spray should be prevented from injecting. Answer C is correct.

The indications show that several control rods did not insert to position 00 but inserted to position 04. Under these conditions, the reactor can still be declared shutdown under all conditions and thus the RPV Control – No ATWS is the correct EOP. The conditions show that the Boron Injection Initiation Temperature (BIIT) curve is violated, and SLC should be injected if the RPV Control – With ATWS EOP was the correct EOP. Since there is no ATWS EOP entry, there is no direction to inject SLC due to violation of the BIIT curve. Answer A is incorrect.

Emergency Depressurization would be required if the Heat Capacity Temperature Limit (HCTL) were violated. But the conditions show that the point is on the good side of the HCTL curve and no ED is required. Answer B is incorrect.

Terminating RPV injection from those sources external to the Primary Containment not required for adequate core cooling is appropriate when the Torus Load Limit (TLL) curve is violated. The provided

	conditions show that TLL is not violated and thus termination of external sources is not required. Answer D is incorrect.					
References to be provided during exam:	None					
Learning Objective	2621.845.0.0052 3055 Given a copy of RPV Control – No ATWS, describe in detail each step or conditional statement, including technical basis, and how to perform each step as required					
Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**		**55.43**	5		
Time to Complete: 3-4 minutes						

Question 14 **1 Point**

The plant is in a refuel outage and fuel movements are in-progress on the refuel floor.

The Refuel Platform Operator had just latched onto a spent fuel bundle in the fuel pool and the mast was being raised to the NORMAL UP position. The intended core location for the bundle is in the 4th core quadrant. The following report was then received from the Control Room Operator:

- The SRM ALL IN light is extinguished

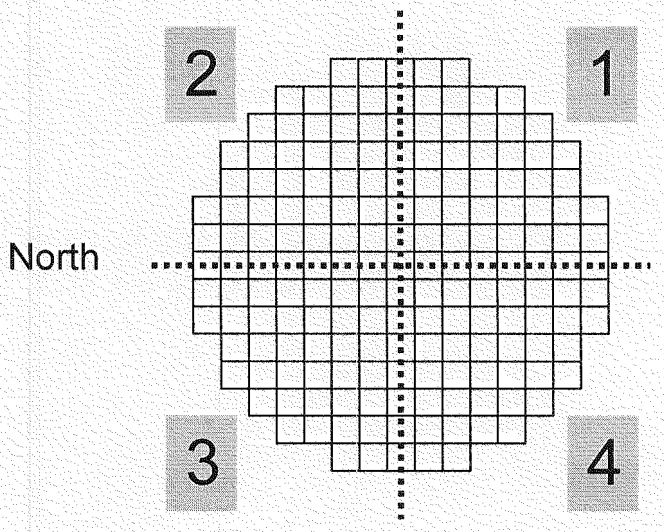
IAW Procedure 205, Reactor Refueling, which of the following directions shall the Fuel Handling Director (SRO) provide?

A. **ALL** core alterations shall be halted.

B. Core alterations shall be halted in the 4th quadrant **ONLY**.

C. Core alterations may continue **ONLY** if SRM 24 indicates > 1 CPS.

D. Core alterations may continue with **NO** further confirmations/verifications.



Question # Answer	14 A	Question Developer Initials/Date: NTP 1/12/09

Knowledge and Ability Reference Information						RO	SRO
215004 Source Range Monitor 2.1.20 - Conduct of Operations: Ability to interpret and execute procedure steps.				Importance Rating		4.6	4.6
Level	**SRO**	**Tier #**	**2**	**Group #**	**1**		
References		205.0		TS 3.9		TS 1.21	

Explanation:

The plant is shutdown with core alterations in progress. A spent fuel bundle is currently being moved within the spent fuel pool, to be inserted into the core area. The control room operator reports to the refuel operator that the SRM all in light is extinguished. Under normal refueling conditions, this light is illuminated and shows that all SRMs are fully inserted. With the light extinguished, one or more SRMs are no longer fully inserted, and thus cannot be considered operable.

Procedure 205 (P&L) requires that a minimum of 2 SRMs are fully inserted, operable and reading at least 1 CPS. The procedure also requires one operable SRM in the quadrant where the core alteration is being performed and one shall be located in an adjacent quadrant.

Since not even the control room operator is able to tell from the panel indications which SRM is not fully inserted, the refuel SRO cannot assume which SRM(s) is/are affected either, and must therefore halt all core alterations – not just alterations in the 4th core quadrant.

TS 3.9 mirrors the same requirement for required SRMs during core alterations as in the procedure. TS 3.9.G goes on to state that if the TS requirements are not met, to cease all core alterations.

TS definition 1.21 defines core alteration, and it only applies to the core area. Loss of SRM operability has no impact on fuel movements in the spent fuel pool. Therefore, all core alterations must cease, but movements in the spent fuel pool may continue. Answer A is correct.

If the Candidate believes the given malfunction only impacts the fourth quadrant, then answer B would appear correct, but it is not.

It is true that an operable SRM must be reading at least 1 CPS IAW procedure 205. But operable SRMs must also be fully inserted. Answer C is incorrect.

If the Candidate thinks that the SRM ALL IN light is normally extinguished when all SRMs are fully inserted, then answer D would

	appear correct. Since the light is ON to show that all SRMs are fully inserted, answer D is incorrect.					
References to be provided during exam:	None					
Learning Objective	2621.812.0.0003 LO 00323 State the responsibilities of the following personnel during refueling operations IAW procedure 205.0: Fuel Handling Director. 2621.812.0.0003 LO 01132 Using plant references, state and interpret the Technical Specification requirements associated with fuel handling.					
Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 2:DR
10 CFR Part 55 Content:	**55.41**		**55.43**	7		
Time to Complete: 1-2 minutes						

Question 15 **1 Point**

The plant was at rated power, with Isolation Condenser A out of service and isolated.

An event then occurred, resulting in the following plant conditions:

- RPV water level indicates 82" and rising
- Drywell temperature indicates 275 °F
- Drywell pressure indicates 2.1 psig
- Breakers GD1 and GC1 indicate green light **ON**
- ARI INITIATED annunciator is in alarm
- ROPS is in BYPASS
- APRMs associated with RPS 1 indicate downscale
- APRMs and LPRMs associated with RPS 2 are oscillating: the APRMs and LPRMs are oscillating between 10 and 55

Which of the following directions shall the SRO direct?

A. Reduce recirculation flow to minimum, IAW the RPV Control – With ATWS EOP

B. Inject the Liquid Poison System IAW Support Procedure 22, Initiating the Liquid Poison System

C. Spray the Drywell IAW Support Procedure 29, Initiation of the Containment Spray System for Drywell Sprays

D. Maintain RPV water level 138" – 175" IAW Support Procedure 19, Feedwater Condensate and CRD System Operation

Question # Answer	15 B	Question Developer Initials/Date: NTP 1/12/09

Knowledge and Ability Reference Information						RO	SRO
211000 Standby Liquid Control System 2.4.6 - Emergency Procedures / Plan: Knowledge of EOP mitigation strategies.					Importance Rating	3.7	4.7
Level	RO	**Tier #**	1	**Group #**	1		
References		RPV Control w/ATWS EOP					

Explanation:

The reactor was at rated power when an event occurred. With RPV water level at 82", a scram should have occurred and a containment isolation signal. Conditions also show that ROPs has been bypassed, which is a step in the ATWS EOP. Also, the APRMs/LPRMs are oscillating in one RPS channel. A power loss could account for the other channel APRMs showing downscale. But given ARI initiated, ROPS manually bypassed and oscillating neutron instrumentation (with no control rod positions provided), an ATWS has occurred.

During an ATWS condition, if oscillations on the LPRMs of 30 watts/cm^2 peak-to-peak occur, then SLC should be initiated IAW SP-22. The conditions are provided that APRMs/LPRMs are oscillating between 10 and 55. Answer B is correct.

In the power leg of the ATWS EOP, if the generator is still on-line, it directs to runback recirculation flow to minimum. But, when RPV water level dropped below 90", all recirculation pumps will automatically trip. Answer A is incorrect.

Conditions of high DW temperature exceed an entry condition for the Primary Containment Control EOP. In the DW temperature leg, spraying the DW is directed only if conditions are within the containment spray initiation limit (CSIL) curve. From the conditions given, the point is on the bad side of the curve and the DW cannot be sprayed from high temperature. DW sprays can also be performed from the DW pressure leg, but it requires DW/Torus pressure > 12 psig. DW pressure is given less than this value. Answer C is incorrect.

When power is >2% in the ATWS EOP, RPV water level should be lowered to below 30" by terminating and preventing. The normal water band of 130-175" is reserved for when the power is <2% during

	an ATWS. Answer D is incorrect.					
References to be provided during exam:	CSIL Curve (provided as part of question 13)					
Learning Objective	2621.845.0.0053 LO 3055A Given a copy of RPV Control – With ATWS, describe in detail each step or conditional statement, including technical basis, and how to perform each step as required.					
Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPK
10 CFR Part 55 Content:	**55.41**		**55.43**	**5**		
Time to Complete: 1-2 minutes						

Question 16 **1 Point**

You have just taken the shift as the SRO. During the previous shift, control rod 30-19 was declared inoperable and valved out of service at position 48. All requirements of Tech Spec 3.2, Reactivity Control, have been verified as satisfactory.

Two hours later, a SJAE malfunction resulted in a degrading condenser vacuum which required a manual scram. The Operator reports the following observations:

- Control rods 30-19 **AND** 30-15 both indicate position 48
- Annunciator COND VAC TRIP 2 10 INCHES is in alarm

Which of the following actions shall the SRO direct?

A. Confirm Recirculation Flow is runback to minimum IAW the RPV Control – With ATWS EOP

B. Bypass the MSIV low-low water level isolation signal IAW Support Procedure 16, Bypassing MSIV Lo-Lo Isolation Interlocks and the RBCCW Interlocks

C. Depressurize the RPV with a cooldown rate below 100 °F/hr using the Main Turbine Bypass Valves IAW the RPV Control – No ATWS EOP

D. Depressurize the RPV with a cooldown rate below 100 °F/hr using Cleanup in Letdown Mode IAW Support Procedure 14, Alternate Pressure Control Systems – Cleanup in Letdown Mode

Question # Answer	16 D	Question Developer Initials/Date: NTP 1/13/09

Knowledge and Ability Reference Information		RO	SRO
214000 RPIS A2.02 - Ability to (a) predict the impacts of the following on the ROD POSITION INFORMATION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Reactor SCRAM	**Importance Rating**	3.6	3.7

Level	SRO	Tier #	2	Group #	2

References	RPV Control – No ATWS EOP	TS 3.2	

Explanation:

The plant is at power when a single control rod is determined to be stuck and is hydraulically isolated at position 48. Tech Spec 3.2 is then verified, which includes shutdown margin with any other control rod (not 30-19) stuck in the full out position. Following the scram, all but 2 control rods show the normal post scram conditions (blank with green backlight). The control rod valved out of service is expected to remain at position 48, but a second control rod also remains at position 48. Because the new SDM calculation has proved that the reactor will remain shutdown with a control rod stuck full out (not 30-19), the reactor is and will remain shutdown under all conditions without boron, with the 2 control rods stuck full-out. Therefore, even if the ATWS EOP is entered, it can be determined that the reactor will remain shutdown under all conditions without boron and the ATWS EOP should be exited and the RPV Control – No ATWS EOP entered.

Even though RPV water level is not stated in the question stem, entry into the RPV Control – w/no ATWS EOP will be entered on low RPV water level from a full power scram. Since the reactor can be concluded shutdown under all conditions without boron, the RPV Control – No ATWS EOP is the correct EOP to enter. In this EOP, the direction to initiate a normal cooldown is correct. But since the provided alarm shows condenser vacuum at 10", this will close and prevent opening of the turbine bypass valves. An alternate method to cooldown is with the RWCU system. Therefore, answer D is correct and answer C is incorrect.

	If the Candidate concludes that the ATWS EOP is the correct EOP to follow, then directing Recirculation flow to minimum would be correct if the turbine were still on-line. There are no indications the turbine is on-line, nor is the ATWS EOP the correct procedure. Answer A is incorrect. Regardless of any conditions, except that an ATWS is in progress, bypassing the MSIV isolation signal would be correct. But since the ATWS EOP is not the correct EOP, performance of this step is incorrect. Answer B is incorrect.

References to be provided during exam:	None	

Learning Objective	2621.845.0.0052 3055 Given a copy of RPV Control – No ATWS, describe in detail each step or conditional statement, including technical basis, and how to perform each step as required.

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X **3:SPK**
10 CFR Part 55 Content:	**55.41**		**55.43**	**5**		
Time to Complete: 1-2 minutes						

Question 17 **1 Point**

The plant was at rated power when the hydrogen monitor for the in-service offgas recombiner was declared inoperable. The alternate recombiner is tagged out of service.

To continue to use the AOG System, which of the following shall the SRO direct, **AND** which states the bases for the hydrogen concentration limit of 4% in Tech Spec 3.6.F, Condenser Offgas Hydrogen Concentration?

	SRO Direction	**TS Bases**
A.	Sample once per day	This represents the flammability limit of hydrogen in air
B.	Sample once per day	This represents the lower limit of detection of hydrogen in steam
C.	Sample every 8 hours	This represents the flammability limit of hydrogen in steam
D.	Sample every 8 hours	This represents the lower limit of detection of hydrogen in air

Question # Answer	17 A	Question Developer Initials/Date: NTP 1/13/09

Knowledge and Ability Reference Information						RO	SRO
271000 Off-gas 2.2.22 - Equipment Control: Knowledge of limiting conditions for operations and safety limits.					Importance Rating	4.0	4.7
Level	**SRO**	**Tier #**	**2**	**Group #**	**2**		
References		TS 3.15		TS 3.6.F			
Explanation:	The plant is at rated power when the offgas recombiner effluent hydrogen monitor fails. There is no indication in the question that the recombiner temperature monitoring is inoperable. Therefore, IAW TS 3.15, daily sampling of the recombiner outlet is required. Sampling on a frequency of 8 hours is intended for when both the hydrogen monitoring and temperature monitoring systems are inoperable. IAW TS 3.6.F bases, the offgas stream is maintained at $\leq$ 4% hydrogen concentration to ensure that the system is operated below the flammability limit of hydrogen in air. Therefore, answer A is correct. The other answers either have the incorrect SRO direction or the incorrect basis, or both. Answer A is correct.							
References to be provided during exam:		TS 3.15					
Learning Objective	2621.850.0.0090 LO 01920 Given various plant indications (and their values) or copies of Control Room/Plant logs, evaluate the indications to determine plant status with respect to the Operating License and Technical Specifications.						

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:F	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**		**55.43**	**2**		
Time to Complete: 1-2 minutes						

Question 18 **1 Point**

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

- COND B FLOW HI POSSIBLE RUPTURE annunciator is in alarm
- SHELL B LVL HI/LO annunciator is in alarm
- ISOL CONDENSER B LEVEL indicates 9.5'
- Isolation Condenser B **CANNOT** be isolated
- RADIATION MONITORS – OFFGAS HI annunciator is in alarm
- RADIATION MONITORS – OFFGAS HI-HI annunciator is in alarm
- MAIN STEAM – RAD HI annunciator is in alarm
- MAIN STEAM LINE RAD MONITORS indicate > 3000 mr/hr
- RPS 1 and RPS 2 SCRAM SOLENOIDS lights are de-energized
- Several Area Radiation Monitors in the Reactor Building are reading slightly above their high setpoint
- The Site Emergency Director has declared a GE EAL (RG1, Radiological Effluent)

Which of the following actions shall the SRO direct?

A. Emergency Depressurize the RPV IAW the Radioactivity Release Control EOP

B. Emergency Depressurize the RPV IAW the Secondary Containment Control EOP

C. Depressurize the RPV to maintain the cooldown rate below 100 °F/hr IAW the RPV Control – No ATWS EOP

D. Rapidly reduce RPV pressure with the Main Turbine Bypass Valves IAW ABN-26, High Main Steam/Offgas/Stack Effluent Activity

Question # Answer	18 A	Question Developer Initials/Date: NTP 1/13/09

Knowledge and Ability Reference Information						RO	SRO
272000 Radiation Monitoring System 2.4.45 - Ability to prioritize and interpret the significance of each annunciator or alarm.					Importance Rating	4.1	4.3
Level	**SRO**	**Tier #**	**2**	**Group #**	**2**		
References		Radioactivity Release Control EOP					

Explanation:

The plant was at rated power when an event occurred. The given conditions show the following: fuel failures as evidenced by offgas and main steam line radiation alarms; a tube break in Isolation Condenser B as evidenced by the high flow annunciator and high water level in the shell. The plant has scrammed as evidenced by the RPS solenoid lights de-energized. The following procedures will be entered: RPV Control – No ATWS EOP (on RPV water level following the scram), Secondary Containment Control EOP (several ARMs in the RB are in alarm), Radioactivity Release Control EOP (indications of an Isolation Condenser tube leak) and ABN-26 (high offgas and main steam radiation monitors).

The requirements to ED in the Rad Release EOP are: indications of fuel damage, and a General Emergency declared due to offsite dose (which has been declared and provided). Therefore, ED is required IAW the Rad Release EOP. Answer A is correct.

ED can be directed from the Secondary Containment Control EOP but there needs to be a discharge of a primary system into secondary containment, and a max safe value exceeded in $\geq$ 2 areas. The indications provided show a general rise in radiation levels in the reactor Building but not to the extent of max safe. Answer B is incorrect.

The RPV Control – No ATWS EOP does direct establishing a normal cooldown, but this is overridden by other EOPs. Answer C is incorrect.

Reducing RPV pressure will reduce the driving head on the leak, but the Main Steam Lime Radiation Monitors shall be isolated IAW ABN-26, when greater than 800 mr/hr, ans thus the turbine bypass valves

	are not available. Answer D is incorrect.					
References to be provided during exam:	Radioactivity Release Control EOP					
Learning Objective	2621.845.0.0058 LO 2483 Using procedure Radioactivity Release Control, evaluate the technical basis for each step and apply this evaluation to determine the correct course of action under emergency conditions.					
Question Source	**Bank**		**Modified Bank**	X	**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X 3:SPR
10 CFR Part 55 Content:	**55.41**		**55.43**	5		
Time to Complete: 1-2 minutes						

Question 19 **1 Point**

The plant is in a refuel outage and fuel movements are in-progress on the refuel floor.

IAW procedure 205.0, Reactor Refueling, which of the following is/are the responsibilities of the Fuel Handling Director (SRO) on the Bridge?

1. Signing for completion of each move on the Fuel Move Sheet.
2. Turning off the Bridge power supply if the Bridge controls fail.
3. Directly supervising the manual movement of fuel and controls in the core.
4. Ensuring all license requirements for refueling are satisfied.

A. 1 **ONLY**

B. 4 **ONLY**

C. 1 and 3

D. 2 and 4

Question # Answer	19 C	Question Developer Initials/Date: NTP 1/14/09

Knowledge and Ability Reference Information					RO	SRO
2.1.40 Knowledge of refueling administrative requirements				Importance Rating	2.8	3.9
Level	**SRO**	**Tier #**	**3**	**Group #**		
References		205.0		TS 1.21		
Explanation:	IAW procedure 205, the FHD (SRO) is responsible for the following: 1) directly supervising all core alterations; 2) having no other concurrent duties during core alterations; 3) signing for completion of each move on the fuel move sheet; 4) maintaining proper communication with the control room licensed operator; 5) assuring proper execution of core alterations IAW procedures and the fuel bundle orientation map; 6) ensuring no other activities in/around the fuel pool and reactor cavity during refuel operations that could distract the bridge operators or create any physical interference with refuel equipment; and, 7) notify the SM and RE of any refuel errors. Of those listed in the question, only selection 1 and 3 (Answer C) is required by procedure as the FHD responsibility. IAW TS 1.21, core alterations includes the manual movement of fuel and controls in the core. Selection 2 is a responsibility of the Fuel Move Spotter and is incorrect. Selection 4 is a responsibility of the Shift Manager and is an incorrect answer.					
References to be provided during exam:	None					
Learning Objective	2621.812.0.0003 LO 00323 State the responsibilities of the following personnel during refueling operations IAW procedure 205.0: Fuel Handling Director.					

Question Source	Bank		Modified Bank		New	X
Question Cognitive Level:	Memory or Fundamental Knowledge		X 1:P	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41		55.43	7		
Time to Complete: 1-2 minutes						

Question 20 **1 Point**

Attached are 2 pages from surveillance test 610.4.002, Core Spray Pump Operability Test. Four (4) proposed procedure changes are annotated on the test (each change is circled and labeled for easy identification).

IAW AD-AA-101, Processing of Procedures and T&RMs, which of the changes will require that the procedure undergo a full review and revision **PRIOR** to implementing the change?

Change #1: Added V-20-27

Change #2: Changed 2F/2F to 1F/2F

Change #3: Changed NZ01B to NZ01D

Change #4: Changed 2700 to 2500

A. Change #1

B. Change #2

C. Change #3

D. Change #4

AmerGen An Exelon Company	OYSTER CREEK GENERATING STATION PROCEDURE	Number **610.4.002**
Title **Core Spray Pump Operability Test**		Revision No. 48

6.0 SYSTEM 1 SURVEILLANCE

6.1 **VERIFY** Section 3.0 Prerequisites are satisfied and **SIGN** Attachment 610.4.002-1. **RECORD** the date of the Surveillance Test.

_____

6.2 IF Core Spray System operation is required during this surveillance,

THEN **CONFIRM** the TEST FLOW RETURN valve, V-20-27, is closed,

Change #1

_____

AND

CONFIRM the Core Spray PUMP DISCHARGE valve is open.

_____

6.3 System Alignment, System 1 (**RECORD** all data entries on Attachment 610.4.002-1 unless directed otherwise).

6.3.1 IF reactor pressure is ≤ 350 psig,

THEN **PERFORM** the following:

a. **UNLOCK** V-20-12, System 1 DISCHARGE Valve, supply breaker (MCC1A21A).

_____

b. **TURN ON** V-20-12, System 1 Discharge Valve, supply breaker (MCC1A21A).

_____

c. CLOSE V-20-12 from the control switch on ~~2F/2F~~ 1F/2F.

Change #2

_____

d. **TURN OFF** breaker for V-20-12 (MCC1A21A).

_____

AmerGen An Exelon Company	OYSTER CREEK GENERATING STATION PROCEDURE	Number 610.4.002
Title **Core Spray Pump Operability Test**		Revision No. 48

8.0 ACCEPTANCE CRITERIA

8.1 The Components tested by this procedure meet Technical Specifications for operability if the follow criteria are met:

- The Core Spray System Pumps Operate as specified in the procedure:

  System 1

  Core Spray Main Pump (NZ01A)

  Core Spray Booster Pump (NZ03A)

  Core Spray Main Pump (NZ01C)

  Core Spray Booster Pump (NZ03C)

  System 2

  Core Spray Main Pump (NZ01B)

  Core Spray Booster Pump (NZ03B)

Change #3 →

  Core Spray Main Pump ~~(NZ01B)~~ (NZ01D)

  Core Spray Booster Pump (NZ03D)

- Core Spray System flow rate:

  System 1 ≥ 3400 gpm (Main and Booster Pumps Running)

Change #4 →

  System 1 ≥ ~~2700~~ 2500 gpm (Main Pump Running only)

  System 2 ≥ 3640 gpm (Main and Booster Pumps Running)

  System 2 ≥ 2900 gpm (Main Pump Running only)

Question # Answer	20 D	Question Developer Initials/Date: NTP 1/14/09

Knowledge and Ability Reference Information						RO	SRO
2.2.6 Knowledge of the process for making changes to procedures.					Importance Rating	3.0	3.6
Level	**SRO**	**Tier #**	**3**	**Group #**			
References	AD-AA-101						

Explanation:

Procedure AD-AA-101, Processing of Procedures and T&RMs, allows changes to procedures prior to a full review and approval. The procedure allows editorial changes and temporary changes to procedures, both of which can be implemented prior to a full review and approval.

Change #1 can be classified as an editorial change since the core spray system 1 test flow return valve is V-20-27, and the addition of the valve number enhances the proper identification of the valve. This change can be implemented prior to a full review and revision process. Answer A is incorrect.

Change #2 is typographical error since there is no control room panel 2F/2F, but the control switch is located on panel 1F/2F. This procedure change can also be controlled as an editorial change. Answer B is incorrect.

Change #3 can also seen to be an editorial change since pump NZ01B is already listed and NZ01D is the correct pump identifier. Answer C is incorrect.

Change #4 appears as it could be controlled as a temporary change, which can be implemented prior to a full review/revision, except that AD-AA-101 specifically prohibits a temporary change which alter technical specification or other regulatory related acceptance criteria, which this clearly is. Therefore, change #4 must proceed with a full review/revision prior to implementing the procedure change. Answer D is correct.

References to be provided during exam:	None	
Learning		

Objective						
Question Source	Bank		Modified Bank		New	X
Question Cognitive Level:	Memory or Fundamental Knowledge		X 1:P	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41		55.43	3		
Time to Complete: 1-2 minutes						

Question 21 **1 Point**

The plant is at rated power with CRD Pump B tagged out of service to replace the pump oil.

The work order requires running surveillance test 617.4.001, CRD Pump Operability Test as a Post Maintenance test (PMT) following work completion.

Which of the following states an additional requirement for the PMT of this pump, if any?

A. The surveillance test is **NOT** adequate by itself. Motor current should also be monitored and documented.

B. The surveillance test is adequate as a PMT and **NO** other actions outside of the surveillance are required.

C. The surveillance test is **NOT** adequate by itself. Bearing temperatures should also be monitored and documented.

D. The surveillance test is **NOT** adequate by itself. A VT-2 leakage inspection should be performed and documented.

Question # Answer	21 C	Question Developer Initials/Date: NTP 1/14/09

Knowledge and Ability Reference Information						RO	SRO
2.2.21 Knowledge of pre- and post-maintenance operability requirements.					Importance Rating	2.9	4.1
Level	**SRO**	**Tier #**	**3**	**Group #**			
References		MA-AA-716-012		617.4.001			
Explanation:	IAW MA-AA-716-012, Post Maintenance Testing, Attachment 1, Generic Post Maintenance Test Matrix, there are 3 types of tests for pump lubricant changeout: bearing temperature, external leakage, and lubrication level checks. The surveillance test does not test or verify any of these recommended actions. Of those actions listed, only answer C specifies a one of the listed actions. Answer C is correct.						
References to be provided during exam:		MA-AA-716-012 Attachment 1			617.4.001 Attachments 1-3		
Learning Objective	2621.828.0.0011 LO 00021 Identify and interpret the test and surveillance procedures for the CRD System, including personnel and equipment allocation.						

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**		**Comprehension or Analysis**			X 2:DR
10 CFR Part 55 Content:	**55.41**		**55.43**	5		
Time to Complete: 1-2 minutes						

Question 22 **1 Point**

As the Shift SRO, you have 3 jobs to assign to 3 EOs on your crew. Below are the estimated dose exposures from each job and the current TEDE for the EOs:

- JOB 1: 200 mrem
- JOB 2: 300 mrem
- JOB 3: 400 mrem
- EO A: 1250 mrem
- EO B: 1650 mrem
- EO C*: 225 mrem

*EO C is a declared pregnant worker

IAW RP-AA-203, Exposure Control and Authorization, and without exceeding the annual dose control level or any federal limits for TEDE, determine who can be assigned which task.

	JOB 1	JOB 2	JOB 3
A.	EO A	EO B	EO C
B.	EO C	EO A	EO B
C.	EO B	EO C	EO A
D.	EO C	EO B	EO A

Question # Answer	22 D	Question Developer Initials/Date: NTP 1/15/09

Knowledge and Ability Reference Information						RO	SRO
2.3.15 Knowledge of radiation exposure limits under normal or emergency conditions.					Importance Rating	3.2	34
Level	SRO	**Tier #**	3	**Group #**			
References		RP-AA-203					
Explanation:	IAW the reference, the TEDE annual dose control level is 2000 mrem. The federal TEDE for a radiation worker is 5000mrem. The federal TEDE limit for a declared pregnant person is 500 mrem. If the Candidate does know either of these limits, then all of the jobs can be assigned to any EO. Since EO C is limited to 500 mrem, EO C can only perform JOB 1. Since EO B is only 350 mrem away from the annual dose control level, then EO C can perform JOB 1 or JOB 2. But since EO C must perform JOB 1, then EO B can only perform JOB 2. EO A can perform any job, but since JOBs 1 & 2 are already taken, then EO A must perform JOB 3. Answer D is correct.						
References to be provided during exam:	None						
Learning Objective							

Question Source	**Bank**		**Modified Bank**	X	**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:D	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**		**55.43**	4		
Time to Complete: 2-3 minutes						

Question 23 **1 Point**

Which of the following EOP actions may cause a rise in the internal dose to workers inside the Reactor Building?

Directing an Operator to ….

A. manually insert control rods using RMCS during an ATWS.

B. insert control rods with the Scram Test Switches during an electric ATWS.

C. perform SP-50, Reactor Building Ventilation Restart, during a refuel floor accident.

D. vent the Drywell IAW SP-36, Venting the Drywell Via The Hardened Vent, during a LOCA.

Question # Answer	23 B	Question Developer Initials/Date: NTP 1/16/09

Knowledge and Ability Reference Information						RO	SRO
2.3.14 Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.					Importance Rating	3.4	3.8
Level	SRO	**Tier #**	3	**Group #**			
References	EMG-SP21						
Explanation:	Shift Management is responsible for the overall safety of plant personnel. During an ATWS, one method used to insert control rods is to individually scram each control rod from the Control Room back panel. During an electric ATWS, the SDV vents and drains remain open. When an individual control rod is scrammed, the control rod over-piston volume flows to the SDV and to an equipment drain tank in the RB. This water is reactor water at the temperature of the RPV. Steam generation in the equipment drain tank can occur which will enter the RB atmosphere causing a rise in the airborne contamination levels, leading to a rise in internal dose. Answer B is correct. Moving control rods during an ATWS is essentially the same as moving control rods any other time and results in no rise in RB airborne contamination levels. Answer A is incorrect. Answers C and D can result in a rise in airborne radiation levels outside of the RB, but no inside the RB. Answers C and D are incorrect.						
References to be provided during exam:	None						
Learning Objective	2621.845.0.0053 LO 3055A Given a copy of RPV Control – With ATWS, describe in detail each step or conditional statement, including technical basis, and how to perform each step as required						

Question Source	**Bank**	X	**Modified Bank**		**New**	
Question Cognitive Level:	**Memory or Fundamental Knowledge**		X 1:P	**Comprehension or Analysis**		
10 CFR Part 55 Content:	**55.41**		**55.43**	**4**		
Time to Complete: 1-2 minutes						

Question 24 **1 Point**

The plant was at rated power when an event occurred as shown in the timeline below:

0800 The reactor was manually scrammed due to rising turbine vibrations

0802 The Operator reports the following:

- All control rods indicate full-in
- RPV water level indicates 150" and rising slowly
- RPV pressure indicates 970 psig and rising slowly
- Primary Containment parameters are normal

0805 The following annunciators alarm:

- S1A BRKR TRIP
- S1B BRKR TRIP

Which of the following actions shall the SRO direct **NEXT** (the **current** time is 0806)?

A. Declare an Unusual Event emergency classification MU1 now, IAW EP-AA-1010

B. Control RPV pressure with the Isolation Condensers IAW ABN-36, Loss of Offsite Power

C. Control RPV pressure with the Turbine Bypass Valves IAW the RPV Control - No ATWS EOP

D. Lineup for injection Fire Water via Core Spray IAW Support Procedure 5, Fire Water Injection for RPV Water Level Control

Question # Answer	24 B	Question Developer Initials/Date: NTP 1/20/09

Knowledge and Ability Reference Information						RO	SRO
2.4.46 Ability to verify that the alarms are consistent with the plant conditions.					Importance Rating	4.2	4.2
Level	SRO	**Tier #**	3	**Group #**			

References	RAP-S1f RAP-T1d	ABN-36	RPVC – No ATWS EOP

Explanation:

The plant was at power when a manual scram was inserted. All control rods inserted and RPV water level and pressure are in an expected band. The annunciators provided show a loss power from Startup Transformers SA and SB. This results in a loss of offsite power. When this occurs, EDG 1 and EDG 2 fast start and load onto 4160 VAC Busses C & D. If alarms for Breaker 1C/1D 86 Lockout were also received, this would have resulted in the loss of the EDGs supplying the emergency busses and a station blackout would result.

ABN-36 directs that the Isolation Condensers be used to control RPV pressure (since the loss of power closed all MSIVs). Answer B is correct.

IAW EP-AA-1010, the loss of both startup transformers would require an unusual event classification after 15 minutes of the loss of power. Since answer A says to declare now, it is incorrect and answer A is incorrect.

When the offsite power sources are lost, both RPS Busses are lost which results in the isolation of the MSIVs. Thus the turbine bypass valves cannot be used for RPV pressure control. Answer C is incorrect.

Water level is given in the question as 150" and rising slowly prior to the loss of offsite power and the loss of Feedwater/Condensate. There are no indications of leaks or breaks in the primary system. If RPV water level did lower substantially, the EOP directs starting CRD and SLC first. Also, fire water would only be used if Core Spray were unavailable and there are no indications that it is not available. Answer D is incorrect.

References to be provided during exam:	EP-AA-1010 Hot Matrix	
Learning Objective	2621.801.0.0001 LO 1407 Given specific plant conditions and appropriate abnormal procedures (ABNs), discuss the actions which should be taken to implement the selected procedures.	

Question Source	**Bank**		**Modified Bank**		**New**	X
Question Cognitive Level:	**Memory or Fundamental Knowledge**			**Comprehension or Analysis**		X **3:SPK**
10 CFR Part 55 Content:	**55.41**		**55.43**	**5**		
Time to Complete: 1-2 minutes						

Question 25 **1 Point**

The plant was at rated power when a main transformer fire began, which was extinguished in 16 minutes. The SM declared an **Unusual Event** emergency classification due to the fire.

IAW EP-AA-112-100-F-01, Shift Emergency Director Checklist, which of the following actions is **REQUIRED** of the Shift Emergency Director?

A. Notification to Lacey Township within 60 minutes of the event.

B. Activation of the Emergency Response Facilities (ERF) (TSC, OSC, JNC).

C. Determination of Protective Action Recommendations (PARs) (shelter, evacuate).

D. Activation of Emergency Exposure Controls, if necessary (authorize emergency exposure, and/or potassium iodide).

Question # Answer	25 D	Question Developer Initials/Date: NTP 1/20/09

Knowledge and Ability Reference Information						RO	SRO
2.4.40 Knowledge of the SRO's responsibilities in emergency plan implementation.					Importance Rating	2.7	4.5
Level	**SRO**	**Tier #**	**3**	**Group #**			
References		EP-AA-112-100-F-01		EP-AA-1010		OC LER 2008-001	
Explanation:	The plant was at rated power when a main transformer fire began and was extinguished in 16 minutes. The SM declared an Unusual Event emergency classification due to the fire. In this condition, and IAW the reference, the SM shall initiate Activation of Emergency Exposure Controls (authorize emergency exposure, and/or potassium iodide), if required. Answer D is correct. Because the emergency class is only a UE, notification to Lacey Township is not required (this is required for a GE classification). Answer A is incorrect. Because this is a non-security threat UE, activation of the ERFs are not required. Answer B is incorrect. Because the emergency class is not a GE, determining PARs is not required. Answer C is incorrect.						
References to be provided during exam:	None						
Learning Objective	G-101 DBIG-CT1 LO G-101-DBIG-01 List the responsibilities of the Shift Emergency Director to include: 1) Classification of the event; 2) Activating the Emergency Response Organization; 3) PAR determination; 4) Required notifications; 5) Activating ERDS; 6) Personnel assembly, accountability, and evacuation of non-essential personnel; 7) Determination if the OSC is to remain activated at the Alert classification; 8) Maintaining a record of Emergency Plan related activities.						

Question Source	Bank		Modified Bank		New	X
Question Cognitive Level:	Memory or Fundamental Knowledge		X 1:F	Comprehension or Analysis		
10 CFR Part 55 Content:	55.41		55.43	5		
Time to Complete: 1-2 minutes						