1	Points: 1.00

Unit 1 had an automatic reactor trip and safety injection occur from full power.

- 1RY8010A, 1A Pressurizer Safety Valve, indicates OPEN.
- Unit 1 RCS pressure is 1150 PSIG and lowering.

1BEP-0, Reactor Trip or Safety Injection is in progress at step 12, "CHECK IF RCS IS INTACT" with the following parameters:

- NO CNMT area radiation monitors are above their ALERT ALARM setpoints.
- CNMT pressure is 0.4 PSIG and stable.
- Both CNMT floor drain sump levels indicate 23 inches and stable.

The operators must...

A. immediately transition to 1BEP-1, Loss of Reactor or Secondary Coolant because transition criteria are met.

B. continue in 1BEP-0 until transition criteria to 1BEP-1, Loss of Reactor or Secondary Coolant is met.

C. transition to 1BEP ES-0.0, Rediagnosis, to transition to 1BEP-1, Loss of Reactor or Secondary Coolant.

D. declare 50.54(x) criteria is met because 1BEP-0 is not designed to respond to the accident in progress.

Answer: B

Answer Explanation:

A is incorrect: Operators will continue in 1BEP-0. It is improper to wait at a diagnostic step when there are more diagnostics to be reviewed.

B is CORRECT: Operators will continue in 1BEP-0 to step 24, which will return the crew to step 7, With a Pzr safety valve open, the PRT rupture disk will fail at 100 PSIG PRT pressure, causing CNMT radiation, pressure and sump levels to rise, which directs transition to 1BEP-1.

C is incorrect: 1BEP ES-0.0 cannot be entered until 1BEP-0 has been exited. This allows the proper diagnosis to be made in the EOP network.

D is incorrect: 1BEP-0 is designed to handle a vapor space LOCA, and 50.54(x) is to be declared only if current procedures will not protect the public.

Question 1 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	13295
User-Defined ID:	
Cross Reference Number:	
Topic:	Transition to BEP-1 with vapor space leak
Num Field 1:	3.8
Num Field 2:	4.5
Text Field:	008G2.4.14
Comments:	Source: New Question, 2/3/14, RFP Cognitive Level: High Reference: 1BEP-0, step 12 K/A 008G2.4.14 Pressurizer Vapor Space Accident: Knowledge of general guidelines for EOP usage. Question meets K/A - Candidate must evaluate the accident as a vapor space leak (it is not presented explicitly as such) to when the transition criteria will be met, and apply rules of usage for EOPs to a Pressurizer vapor space leak. 10CFR55.41(b)(10)

Associated objective(s):

GIVEN a set of plant conditions, DIAGNOSE and ANALYZE a Loss of Reactor or Secondary Coolant

2 **Points: 1.00**

Unit 1 had an automatic reactor trip and safety injection occur from full power.

Twenty minutes after the initial transient:

- No RCP's are running.
- Core exit TC's read 580°F.
- PZR level is off-scale low.
- RCS pressure is 1310 psig.

The operators begin withdrawing more steam from the S/G's and raise the AFW flow rate to maintain S/G levels.

How and why will ECCS flow change as a result of these operator actions?

ECCS flowrate will...

A. remain the same. The ECCS pumps will maintain a constant pressure for a specific size of RCS leak.

B. remain the same. Cooling down the RCS will raise subcooling, but will not affect RCS pressure.

C. increase. Cooldown of RCS will lower Pzr spray temperature, lowering pressurizer pressure, allowing it to refill.

D. increase. As the RCS cools down, its pressure lowers, and the ECCS pumps operate against a lower head.

Answer: D

Answer Explanation:

A is incorrect: ECCS pumps discharge flowrate will vary with RCS pressure, which is affected by both leak size and any cooldown of the RCS.

B is incorrect: As RCS pressure lowers, the ECCS injection flow will rise. Cooling down the RCS will lower its temperature and pressure.

C is incorrect: With no RCPs running, there is no Pzr spray flow, so changes in RCS temperature will not affect Pzr spray temperature.

D is CORRECT: Cooling the RCS lowers its temperature and pressure, lowering leak flow and raising injection flow.

Question 2 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	8071
User-Defined ID:	
Cross Reference Number:	
Topic:	Post loca cooldown effect on ECCS flowrate
Num Field 1:	3.0
Num Field 2:	3.3
Text Field:	009EK2.03
Comments:	Source: New question, 2/3/14 RFP Cognitive level: High Reference: 1BEP ES-1.2 background steps 8 and 11 K/A 009EK2.03 Knowledge of the interrelations between the small break LOCA and the following: S/Gs. Question meets K/A - Candidate must evaluate the effect on the ECCS flowrate of using the S/Gs to cooldown the RCS. 10CFR55.43(b)(5)

Associated objective(s):

GIVEN a set of plant conditions, DIAGNOSE and ANALYZE a Post LOCA Cooldown and Depressurization

3	Points: 1.00

Which ONE of the following parameters differentiates between a LOCA and a steam line break inside containment?

A. Containment humidity

B. Containment pressure

C. Containment radiation

D. Containment temperature

Answer: C

Answer Explanation:

A is incorrect: CNMT humidity will rise for both a LOCA and a steam line break inside containment.

B is incorrect: CNMT pressure will rise for both a LOCA and a steam line break inside containment.

C is CORRECT: The background document to BEP-0 for the diagnostic step of transitioning to BEP-1 for a LOCA states that "abnormal containment radiation, pressure or containment floor drain sump level is indicative of a high energy line break in containment....For smaller size breaks containment pressure and sump level may not rise for a period of time; however, containment radiation would be apparent. EP-1 is used for breaks in the RCS."

D is incorrect: CNMT temperature will rise for both a LOCA and a steam line break inside containment.

Question 3 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28630
User-Defined ID:	
Cross Reference Number:	
Topic:	contrast LOCA and steam break
Num Field 1:	3.7
Num Field 2:	3.7
Text Field:	011EA2.13
Comments:	Source: Byron exam bank Cognitive Level: Memory Reference: 1BEP-0, Reactor Trip or Safety Injection K/A 011EA2.13 Ability to determine or interpret the following as they apply to a Large Break LOCA: Difference between overcooling and LOCA indications. Question meets K/A - Candidate must know the effects of a steam line break on the various sensors in CNMT as compared with a primary LOCA. 10CFR55.41(b)(5)

Associated objective(s):

Given a set of plant conditions, DIAGNOSE and ANALYZE a faulted steam generator.

4	Points: 1.00

Unit 1 is at 26% power.

The 1A RCP breaker tripped open due to undervoltage on Bus 157.

What automatic or required manual action will occur as a result of the trip of the RCP?

A. The reactor will automatically trip due to the open RCP breaker.

B. The reactor will automatically trip due to RCS loop low flow condition.

C. The reactor will be manually tripped by the operator.

D. A normal plant shutdown will be initiated.

Answer: C

Answer Explanation:

A is incorrect: The single loop loss of flow trip is blocked below P-8 (30% power).

B is incorrect: The RCP Breaker Open trip requires 2 of 4 breakers open to generate a trip.

C is CORRECT: No AUTO trip is expected due to power < P-8. Administrative direction for a RCP trip in these conditions is to trip reactor.

D is incorrect: There is no administrative direction to shutdown the reactor in this situation; the instruction is to trip the reactor.

Question 4 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	410
User-Defined ID:	
Cross Reference Number:	
Topic:	Action taken on RCP trip
Num Field 1:	3.7
Num Field 2:	4.1
Text Field:	015AK1.02
Comments:	Source: Byron exam bank Cognitive level: Memory Reference: BAR 1-BP-3.7, 1-BP-3.5 K/A 015AK1.02 Knowledge of the operational implications of the following concepts as they apply to Reactor Coolant Pump Malfunctions (Loss of RC Flow): Consequences of an RCPS failure. Question meets K/A - Candidate must know the effects of a loss of RC flow on the operating plant, and the actions that must be taken in response to the loss. 10CFR55.41(b)(7)

Associated objective(s):

ANALYZE and PREDICT the effect that a loss of (a) Reactor Coolant Pumps will have on the following: Reactor Protection System

DESCRIBE the operational limitations, and the reasons for them, on the Reactor Coolant Pump regarding: The Conditions That Dictate a Trip of the Reactor Coolant Pump by the Operator

EVALUATE the response of the 6.9 KV and 4 KV buses for the following condition: Bus undervoltage

5 **Points: 1.00**

Unit 1 is in MODE 5.

- RCS drain down activities are in progress for refueling.
- 1A RH pump is RUNNING in Shutdown Cooling mode.

The following occurs:

- 1A RH Pump amps, discharge pressure and flow begin to fluctuate (Amps cycle up and down by 10 amps, and pressure cycles up and down by 20 PSIG).

With the above conditions and per 1BOA PRI-10, "Loss of RH Cooling", the Unit 1 Operators will INITIALLY...

A. open 1A RH pump RWST suction valve (1SI8812A) to raise Unit 1 Reactor Vessel level, to stop boiling in the reactor vessel.

B. reduce 1A RH Pump flow OR adjust charging or letdown to raise Unit 1 Reactor Vessel level, to restore RH Pump NPSH.

C. trip the 1A RH Pump, because of vortexing and air entrainment in the pump.

D. trip the 1A RH Pump, then start the 1B RH Pump, because of 1A RH pump impeller failure.

Answer: B

Answer Explanation:

A is incorrect: The given conditions indicate a loss of pump NPSH, not core boiling. If not responded to properly, eventually core boiling could take place.

B is CORRECT: Either of the procedurally directed actions will restore RH pump NPSH.

C is incorrect: Vortexing is not indicated, because that results in pressure, flow, and pump amps all lowering, not fluctuating up and down.

D is incorrect: Pump impeller degradation would result in lower pressure, amps and flow, not fluctuation of the parameters.

Question 5 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	15153
User-Defined ID:	
Cross Reference Number:	
Topic:	Actions on loss of RH cooling
Num Field 1:	3.9
Num Field 2:	4.1
Text Field:	025AK3.03
Comments:	Source: Modified from Byron exam bank Cognitive Level: Memory Reference: 1BOA PRI-10 K/A 025AK3.03 Knowledge of the reasons for the following responses as they apply to the Loss of Residual Heat Removal System: Immediate actions contained in EOP for Loss of RHRS. Question meets K/A - Candidate must know the reasons for the actions they are taking in response to a casualty to the RHR system. 10CFR55.41(b)()

Associated objective(s):

DISCUSS the purpose of 1/2BOA PRI-10, Loss of RH Cooling

6	Points: 1.00

Unit 1 is at 100% power.

- Due to transmitter failures, 1PI-455A is failed at 1700 PSIG and 1PI-457 is failed at 2500 PSIG.

To maintain both Pzr PORVs CLOSED in AUTO, the NSO will verify/place the Pressure Control Switch to...

A. CH 455/456, and this will allow Master Pressure Controller 1PK-455A to be placed in AUTOMATIC.

B. CH 455/456, and this will require Master Pressure Controller 1PK-455A to be maintained in MANUAL.

C. CH 457/458, and this will allow Master Pressure Controller 1PK-455A to be placed in AUTOMATIC.

D. CH 457/458, and this will require Master Pressure Controller 1PK-455A to be maintained in MANUAL.

Answer: B

Answer Explanation:

A is incorrect: The PORVs will remain closed, but the Master Pressure Controller output would fail low, so it can't be returned to AUTOMATIC.

B is CORRECT: The PORVs will remain closed, and the Master Pressure Controller must be manually controlled since channel 455 controls it and is failed low.

C is incorrect: 1RY455A would OPEN, and since channel 457 is failed high, it would drive the Master Pressure Controller output high.

D is incorrect: 1RY455A would OPEN. The second part of the distracter is correct - in this case the Master Pressure Controller must still be manually controlled.

Question 6 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	5713
User-Defined ID:	
Cross Reference Number:	
Topic:	Effect of multiple failed pressure channels
Num Field 1:	2.9
Num Field 2:	3.0
Text Field:	027AK3.02
Comments:	Source: New question, 2/4/14 RFP Cognitive Level: High Source: UFSAR section 7.7.1.5 and Figure 7.7-4 K/A 027AK3.02 Knowledge of the reasons for the following responses as they apply to the Pressurizer Pressure Control Malfunctions: Verification of alternate transmitter and/or plant computer prior to shifting flow chart transmitters. Question meets K/A - Candidate must understand the master pressure controller must be maintained in manual with the stated alternate transmitter failed when the control switch is selected to normal or alternate transmitters. Candidate must also know the alternate transmitter control scheme to realize a PORV would open if shifted to alternate scheme. 10CFR55.41(b)(3)

Associated objective(s):

ANALYZE a given set of plant conditions and DETERMINE which instrument has failed: Pressurizer Pressure Channel

ANALYZE a given set of plant conditions and DETERMINE the required actions per 1/2BOA INST-2, Operation with Failed Instrument Channel

DESCRIBE the actions necessary to stabilize the plant following a Process Instrumentation malfunction

7 **Points: 1.00**

Unit 1 was at 100% power when an ATWS occurred.

- The crew is currently implementing 1BFR S.1, Response to Nuclear Power Generation/ATWS, Step 6 RNO for, "Check If the Following Trips Have Occurred: Reactor Trip" to trip the reactor LOCALLY.

If the Reactor Trip Breakers will NOT open, which are the MINIMUM breakers that must be opened to shutdown the reactor?

A. The motor AND generator breakers, on EITHER Rod Drive Motor-Generator set

B. The motor OR generator breaker, on EITHER Rod Drive Motor-Generator set

C. The motor AND generator breakers, on BOTH Rod Drive Motor-Generator sets

D. The motor OR generator breakers, on BOTH Rod Drive Motor-Generator sets

Answer: D

Answer Explanation:

A is incorrect: This would shut down 1 RD MG set, which will not shutdown the reactor.

B is incorrect: This would shut down 1 RD MG set, which will not shutdown the reactor.

C is incorrect: This would shut down both RD MG sets, which will shutdown the reactor, but is not the minimum number of breakers that must be opened.

D is CORRECT: This would shut down both RD MG sets, which will shutdown the reactor. 1 motor or generator breaker on both sets will de-energize the rod drive system, dropping the rods into the core.

Question 7 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	11521
User-Defined ID:	
Cross Reference Number:	
Topic:	RD MG breakers open for ATWS
Num Field 1:	2.9
Num Field 2:	3.1
Text Field:	029EK2.06
Comments:	Source: New question, 2/5/14 RFP Cognitive Level: High Reference: UFSAR section 7.7.1.2 & 1BFR S.1 Step 6 K/A 029EK2.06 ATWS Knowledge of the interrelations between the ATWS and Breakers, relays and disconnects. Question meets K/A - Candidate must understand the power supply arrangement for the Rod Drive system, not simply have 1BFR S.1 memorized (which directs ALL the breakers to be opened). 10CFR55.41(b)(6)

Associated objective(s):

Given a specific Functional Restoration S-Series Procedure step, STATE the basis for the actions described in that step

WHICH of the following AUTOMATIC actions occur when HIGH activity is sensed by the Blowdown Afterfilter 0A Outlet Radiation Monitor, 0PR16J?

A. Blowdown Monitor Tank valve 0WX58A OPENS and Condenser Inlet Header valve 0WX119A CLOSED to prevent contaminating the Main Condenser.

B. Secondary Sampling System inlet valves _PS179A-D, CLOSE to prevent high radiation at the Secondary Sampling System ONLY.

C. Secondary Sampling System inlet valves _PS179A-D, CLOSE to prevent high radiation at the Primary Sampling System AND the Secondary Sampling System.

D. Blowdown Sample Isolation valves _SD005A-D to S/G Blowdown Demins CLOSE to prevent contaminating the demineralizers.

Answer: A

Answer Explanation:

A is CORRECT: The listed valves do realign as shown, for the reason shown per BOP AR/PR11T1.

B is incorrect: High radiation does isolate the Secondary Sampling System, but from a high radiation signal from _PR008J, not 0PR16J.

C is incorrect: The Primary Sampling System does get input from the blowdown system, but is not isolated by _PS179A-D, and not by 0PR16J

D is incorrect: _SD005's do NOT close on a high radiation signal from any monitor.

Question 8 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	8459
User-Defined ID:	
Cross Reference Number:	
Topic:	Blowdown isolation on high rads
Num Field 1:	3.9
Num Field 2:	4.1
Text Field:	038EK3.04
Comments:	Source: Modified from bank Cognitive Level: Memory Reference: BOP AR/PR-11T1 K/A 038EK3.04 Steam Generator Tube Rupture: Knowledge of the reasons for the following responses as they apply to the SGTR: Automatic actions provided by each PRM Question meets K/A - Candidate must know how valves are automatically realigned on a high radiation signal caused by a SGTR, and why these actions are incorporated into the plant design. 10CFR55.41(b)(11)

Associated objective(s):

DISCUSS operation of the steam generator during the following plant condition: S/G Tube Leak

9	Points: 1.00

Unit 1 was at 100% power, when the following sequence of events occurred:

- 09:30 A Main Steamline break has occurred on Unit 1.
- 09:45 Operators are executing 1BFR P.1, "Response to Imminent Pressurized Thermal Shock Condition".
- 10:00 A Unit 1 RCS soak is determined to be required. RCS pressure is currently stable at 800 psig.

The following Unit 1 RCS Cold Leg temperatures are subsequently recorded:

- 10:00 240°F
- 10:30 220°F
- 11:00 215°F
- 11:30 200°F
- 12:00 200°F
- 12:30 200°F
- 13:00 200°F

With the above conditions, the EARLIEST time AFTER WHICH the Unit 1 RCS cooldown can be resumed is:

A. 11:30

B. 12:00

C. 12:30

D. 13:00

Answer: C

Answer Explanation:

A is incorrect: Temperature has not been stable for an hour, it cooled down 20° in the last half hour.

B is incorrect: Temperature has not been stable for an hour, it has been stable for 30 minutes.

C is CORRECT: Temperature has been stable for an hour, so this is the earliest a further cooldown can start, in accordance with 1BFR P.1.

D is incorrect: Temperature has been stable for 90 minutes, so this in NOT the "earliest" a further cooldown could be started.

Question 9 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	14571
User-Defined ID:	
Cross Reference Number:	
Topic:	BFR P.1 soak time
Num Field 1:	4.1
Num Field 2:	4.4
Text Field:	040AK1.01
Comments:	Source: Bank Cognitive Level: High Reference: 1BFR P.1 step 24 K/A 040AK1.01 Steam Line Rupture: Knowledge of the operational implications of the following concepts as they apply to Steam Line Rupture: Consequences of PTS Question meets K/A - Candidate must operate within the limits of the procedure to prevent any further pressurized thermal shock to the reactor vessel after the severe cooldown caused by the steam line rupture. 10CFR55.41(b)(5)

Associated objective(s):

Without the use of the P-Series Procedure, DISCUSS the steps required to restore the critical safety function to within specifications

10 **Points: 1.00**

Unit 2 NSO reports the loss of ALL AC power to both 4KV ESF busses.

- The NSO actuated the manual reactor trip switches on both 2PM05J and 2PM06J.
- One of the reactor trip breakers failed to open (remains closed).
- The DRPI panel is deenergized.
- Reactor power is 1% and lowering.
- Negative SUR is indicated on the intermediate range instruments.

In response to these conditions, the next immediate operator action the NSO is required to take is to...

A. verify the Main Turbine is tripped.

B. dispatch an EO to start an Emergency Diesel Generator locally.

C. manually actuate Main Steamline Isolation.

D. start BOTH Auxiliary Feedwater Pumps.

Answer: C

Answer Explanation:

A is incorrect: Loss of the ESF busses does not cause a reactor trip, so 2BEP-0 is not yet entered; this is the 2nd immediate action from 2BEP-0.

B is incorrect: This is a BOA action directed from step 3 of 2BEP-0 when a single ESF bus is not energized. Both busses are de-energized so 2BCA 0.0 is entered directly. This is also the 2nd immediate action in 2BFR S.1, but that procedure is also not implemented.

C is CORRECT: 2BCA 0.0 is entered directly and is the controlling procedure until exited or BSTs are directed to be implemented. BCA-0.0 step 1 action is satisfied and the next step is to main steam line isolate.

d is incorrect: This is the 3rd action of 2BFR S.1, after tripping the reactor and turbine. 2BFR S.1 is not entered because the reactor trip criteria of 2BCA 0.0 are satisfied.

Question 10 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	8680
User-Defined ID:	
Cross Reference Number:	
Topic:	Actions for loss all AC with trip breaker shut
Num Field 1:	4.6
Num Field 2:	4.4
Text Field:	055G2.4.49
Comments:	Source: Bank Cognitive Level: Memory Reference: 2BCA 0.0 Step 1 RNO K/A 055G2.4.49 Station Blackout: Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. Question meets K/A - Candidate must remember the immediate action procedure steps in response to a loss of all AC power. 10CFR55.41(b)(10)

Associated objective(s):

LIST all Immediate Actions for CA-0.0

STATE the entry conditions of CA-0.0

11	Points: 1.00

Unit 1 is at 100% power.

- Bus 142 Reserve Feed ACB 1424 is OPEN and removed from the cubicle for maintenance.
- Bus 142 SAT Feed ACB 1422 tripped open due to an internal mechanical problem of the breaker.
- 1B DG automatically started and DG Output Breaker ACB 1423 closed.

Which Tech Spec LCO(s) apply to this situation?

A. 3.0.3

B. 3.8.1 AC Sources - Operating AND 3.8.9 Distribution Systems - Operating

C. 3.8.1 AC Sources - Operating ONLY

D. 3.8.9 Distribution Systems - Operating ONLY

Answer: C

Answer Explanation:

A is incorrect: TS 3.0.3 does not apply, since this situation is addressed by a LCOAR.

B is incorrect: Bus 142 IS still operable, and in fact would be powered from 1B DG when the supply breaker trips.

C is CORRECT: 3.8.1 Condition A applied when ACB 1424 was taken out of service, and Condition D applies when ACB 1422 tripped open.

D is incorrect: Bus 142 IS still operable, and in fact would be powered from 1B DG when the supply breaker trips.

Question 11 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	5549
User-Defined ID:	
Cross Reference Number:	
Topic:	SAT feed breaker trip at power - LCOAR
Num Field 1:	3.1
Num Field 2:	4.2
Text Field:	056G2.2.36
Comments:	Source: New question, 2/7/2014 RFP Cognitive Level: Memory Reference: TS 3.8.1 and TS 3.8.9 K/A 056G2.2.36 Loss of Off-site Power: Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations. Question meets K/A - Candidate must know the LCO entry conditions for the given situation, which is a loss of off-site power combined with relevant maintenance activities. 10CFR55.41(b)(5)

Associated objective(s):

DESCRIBE the actions necessary to stabilize the plant following the Loss of Offsite Power

ANALYZE a given set of plant conditions pertaining to the Loss of Offsite Power, and DETERMINE, LOCATE and APPLY any applicable Technical Specification or Technical Requirements Manual required actions

12	Points: 1.00

Both units are at 100% power.

- DC Bus 211 Battery Charger DC Output Breaker CB-2 tripped 10 minutes ago, and cannot be reclosed.

The status of DC Bus 211 is CURRENTLY...

A. energized, and can be supplied power from DC Bus 111 crosstie.

B. energized, and can be supplied power from DC Bus 212 crosstie.

C. de-energized, and can be supplied power from DC Bus 111 crosstie.

D. de-energized, and can be supplied power from DC Bus 212 crosstie.

Answer: A

Answer Explanation:

A is CORRECT: The battery maintains power until it is depleted (about 2 hours under normal loads before the bus voltage is too low to cross-tie). The cross-tie is from the opposite unit's same division DC bus.

B is incorrect: The bus does stay powered, but the cross-tie supply is not DC Bus 212. This is the opposite division bus on the same unit, so could be considered a possible supply.

C is incorrect: The battery output breaker is AF-2, and would isolate the battery charger on a trip, just like AF-1. But it also isolates the battery, which would de-energize Bus 211. DC 111 is the cross-tie supply.

D is incorrect: The battery output breaker is AF-2, and would isolate the battery charger on a trip, just like AF-1. But it also isolates the battery, which would de-energize Bus 211. DC 212 is not the cross-tie supply.

Question 12 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28631
User-Defined ID:	
Cross Reference Number:	
Topic:	Crosstied DC Bus power supply
Num Field 1:	3.4
Num Field 2:	3.5
Text Field:	058AA1.01
Comments:	Source: Bank Cognitive Level: Memory Reference: 2BOA Elec-3, Att A, Step 6 K/A 058AA1.01: Loss of DC Power: Ability to operate and/or monitor the following as they apply to the Loss of DC power: Cross-tie of the affected dc bus with the alternate supply. Question meets K/A - Candidate must know the source of alternate power to a DC bus, and whether the bus stays energized or loses power on a trip of the battery charger, ie, whether the battery and charger are independent supplies to the DC bus. 10CFR55.41(b)(6)

Associated objective(s):

Given a set of plant conditions or parameters indicating a Loss of a DC Bus and a set of plant procedures, IDENTIFY the correct procedure(s) to be utilized and DISCUSS required operator actions

13	Points: 1.00

Unit 2 is at 100% power.

- The Essential Service Water (SX) system has developed a large leak, and the temperatures of components served by SX are rising.

2BOA PRI-7, ESSENTIAL SERVICE WATER MALFUNCTION, has been entered with the following conditions:

- 2A RCP motor radial bearing temperature is 130°F and rising.
- 2A RCP motor thrust bearing temperature is 135°F and rising.
- 2A RCP lower radial bearing temperature is 135°F and rising.
- 2A RCP seal leakoff temperature is 150°F and rising.

If ALL listed temperatures continue to rise at a constant 5°F per minute, the operators will be required to trip the reactor and the Reactor Coolant Pump in no more than...

A. 9 minutes.

B. 12 minutes.

C. 17 minutes.

D. 18 minutes.

Answer: B

Answer Explanation:

A is incorrect: It would take 9 minutes for seal leakoff temperature to reach 195°F, but its limit is 235°F.

B is CORRECT: It takes 12 minutes for motor thrust bearing temperature to reach 195°F, the most limiting parameter listed.

C is incorrect: It would take lower radial bearing 17 minutes to reach its limit of 225°F.

D is incorrect: It would take seal leakoff 18 minutes to reach its limit of 235°F.

Temperature limits are:

- motor radial bearing: 195°F
- motor thrust bearing: 195°F
- lower radial bearing: 225°F
- seal leakoff: 235°F

Question 13 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28632
User-Defined ID:	
Cross Reference Number:	
Topic:	Evaluate temperature rise on RCPs
Num Field 1:	2.8
Num Field 2:	3.1
Text Field:	062AA2.06
Comments:	Source: New, 2/10/14 RFP Cognitive Level: High Reference: 2BOA PRI-7, Table A K/A 062AA2.06 Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: The length of time after the loss of SWS flow to a component before that component may be damaged Question meets K/A – Candidate must be able to determine the length of time based on the temperature rise of equipment, until the equipment must be shutdown to prevent equipment damage. 10CFR55.41(b)(8)

Associated objective(s):

ANALYZE a given set of plant conditions and DETERMINE the required actions per 1/2BOA PRI-7/1BwOA PRI-8, Essential Service Water Malfunction

14	Points: 1.00

Unit 1 is at 100% power.
If Instrument Air is lost to 1CV182, Seal Injection Charging Flow Control Valve, the valve will fail...

A. OPEN, causing seal injection flow to RISE.

B. OPEN, causing seal injection flow to LOWER.

C. CLOSED, causing seal injection flow to RISE.

D. CLOSED, causing seal injection flow to LOWER.

Answer: B

Answer Explanation:

A is incorrect: 1CV182 fails open, which causes seal injection flow to lower. If candidate thinks the valve is throttled open for more seal injection flow, they would pick this choice.

B is CORRECT: 1CV182 is in the charging line, downstream of the tapoff for seal injection. It is normally throttled partially open. When instrument air is lost, it will fail open, allowing more flow down the charging line, and less seal injection flow.

C is incorrect: If 1CV182 failed closed, it would cause seal injection flow to lower. The valve will fail closed on a loss of control power, but fails open on loss of IA.

D is incorrect: If candidate thinks the valve fails closed on loss of IA, and that the valve is throttled closed for less seal injection flow, they would pick this choice.

Question 14 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28633
User-Defined ID:	
Cross Reference Number:	
Topic:	AOV failure position
Num Field 1:	2.9
Num Field 2:	3.3
Text Field:	065AA2.08
Comments:	Source: Bank Cognitive Level: High Reference: M-64 sheet 3B K/A 065AA2.08 Loss of Instrument Air: Ability to determine and interpret the following as they apply to the Loss of Instrument Air: Failure modes of air-operated equipment. Question meets K/A - Candidate must know the effect of the failure position of the air operated valve, so must not only determine, but interpret it. 10CFR55.41(b)(7)

Associated objective(s):

Given a copy of the Loss of Instrument Air Procedure, DISCUSS the basis of each step, note or caution in the procedure

15 **Points: 1.00**

Unit 1 had an automatic reactor trip and safety injection occur from full power.

- 1BCA-1.2, LOCA Outside Containment, Step 2 "Try to Identify and Isolate break", is in progress.
- 1SI8835, SI Pumps to Cold Legs Isolation Valve has just been CLOSED.

Positive indication that the leak is isolated is...

A. RH pump flows begin LOWERING

B. CETC temperatures begin LOWERING.

C. SI pump discharge pressures begin RISING.

D. RCS pressure begins RISING.

Answer: D

Answer Explanation:

A is incorrect: A rise is RCS pressure COULD cause RH system flow to lower, but so could closing the SI valve even if the leak wasn't isolated because it would reduce an injection flowpath.

B is incorrect: CETC lowering could be caused by more effective cooling, but not necessarily because the leak is isolated.

C is incorrect: SI flow will lower, and pressure rise, when the flowpath is reduced. This doesn't mean the leak is isolated.

D is CORRECT: The note on page 5 states if RCS pressure begins to RISE, the ECCS valve(s) should remain closed. This is the only acceptable criteria to determine the leak is isolated.

Question 15 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	17986
User-Defined ID:	
Cross Reference Number:	
Topic:	Leak outside CNMT isolation
Num Field 1:	3.5
Num Field 2:	3.9
Text Field:	E04EK2.1
Comments:	Source: Bank Cognitive Level: Memory Reference: 1BCA 1.2 K/A E04EK2.1 LOCA Outside Containment: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features. Question meets K/A - Candidate must know the effect of isolating a LOCA outside CNMT with a manual "feature", in this case, the SI valve. This is part of the safety system for a LOCA. 10CFR55.41(b)(8)

Associated objective(s):

EXPLAIN the intent of each, note, and caution of CA-1.1 and CA-1.2

16 **Points: 1.00**

Which of the following conditions requires implementation of 2BCA 1.1, Loss of Emergency Coolant Recirculation?

A. CV/SI Pump Suction Valves from RH, 2CV8804A and 2SI8804B can NOT be opened.

B. 2SI8811A and 2SI8811B, CNMT Sump Isolation Valves, can NOT be opened.

C. Only ONE RH pump can be started.

D. CENT CHG pump miniflow isolation valves 2CV8110, 2CV8111, 2CV8114 AND 2CV8116 failed OPEN.

Answer: B

Answer Explanation:

A is incorrect: 2BCA 1.2 does not address supplying CV and SI pumps from RH. The procedure attempts to restore a recirculation path from CNMT sumps to RH pumps and failing that, cooling down the RCS while conserving the RWST water supply.

B is CORRECT: SI8811 valves failing to open are addressed by 2BCA 1.2; this is a transition to this procedure.

C is incorrect: BOTH RH pumps failing to start are addressed by 2BCA 1.2; a single pump not running will not transition to this procedure.

D is incorrect: The miniflow isolation valves are deliberately opened when isolating leakage paths, but this is plausible in that it would remove water from CNMT to the RWST.

Question 16 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	8684
User-Defined ID:	
Cross Reference Number:	
Topic:	CA 1.1 component response
Num Field 1:	4.0
Num Field 2:	4.0
Text Field:	E11EA1.1
Comments:	Source: Bank Cognitive Level: Memory Reference: 2BCA 1.1 K/A E11EA1.1 Loss of Emergency Coolant Recirculation: Ability to operate and/or monitor the following as they apply to the Loss of Emergency Coolant Recirculation: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features. Question meets K/A - Candidate must be able to operate and monitor the correct safety systems and components in regards to a Loss of Recirculation to rectify what the procedure is designed to address.. 10CFR55.41(b)(8)

Associated objective(s):

Given a set of plant conditions, EVALUATE whether entry into CA-1.1 and CA-1.2 is appropriate

17	Points: 1.00

Unit 1 operators are responding to a reactor trip.

- The Unit 1 CST ruptured and is slowly draining to ground level.
- Both Unit 1 Auxiliary Feedwater Pumps (AFP) automatically started when Unit 1 Steam Generator levels lowered below the automatic start setpoint.
- All Unit 1 SG levels are steady at 10% NR.
- An EO reports the AFPs' suction pressures are lowering at a constant rate of 1 PSI per minute.

When annunciator 1-3-E7, AF PUMP SX SUCT VLVS ARMED alarms, both AFPs will...

A. continue to run, and 1AF006A & B and 1AF017A & B (SX to AF Supply Valves) will automatically open.

B. continue to run, and 1AF006A & B and 1AF017A & B (SX to AF Supply Valves) must be manually opened from the Main Control Room.

C. trip, and 1AF006A & B and 1AF017A & B (SX to AF Supply Valves) will automatically open, and both AFPs will automatically restart.

D. trip, and 1AF006A & B and 1AF017A & B (SX to AF Supply Valves) will automatically open, and both AFPs must be manually restarted from the Main Control Room.

Answer: A

Answer Explanation:

A is CORRECT: The SX supply valves will automatically open at 18.1 PSIA (which is the setpoint for the listed alarm), and the AFP trip setpoint is 16.5 PSIA, so if pressure is only lowering at 1 PSI per minute, it will take 90 seconds to reach the pump trip setpoint after the valves begin to open. As soon as they start to open, SX pressure at about 100 PSIG will fill the AFP suction line, raising pressure.

B is incorrect: The SX supply valves would have to be manually opened if SG level rose above the Low-2 level (18% on Unit 1) because this signal will reset, but in the stem, level is still at 10%, maintaining the auto open signal.

C is incorrect: The AFPs would trip if pressure dropped below 16.5 PSIA, but that would not happen at the given trend. They would automatically restart if pressure did drop below the trip setpoint, then recovered.

D is incorrect: The AFPs would trip if pressure dropped below 16.5 PSIA, but that would not happen at the given trend. They would automatically restart if pressure did drop below the trip setpoint, then recovered.

Question 17 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	873
User-Defined ID:	
Cross Reference Number:	
Topic:	AF pump supply and start
Num Field 1:	3.7
Num Field 2:	3.9
Text Field:	E05AK2.1
Comments:	Source: New, 2/11/14 RFP Cognitive Level: High Reference: AF suction pressure EC K/A E05AK2.1 Loss of Secondary Heat Sink: Knowledge of the interrelations between the Loss of Secondary Heat Sink and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features. Question meets K/A - The plant is in danger of a loss of secondary heat sink (low SG level with ruptured CST) and the candidate must evaluate the plant conditions to choose the correct automatic or manual features that protect it in this situation. 10CFR55.41(b)(7)

Associated objective(s):

DESCRIBE the back-up water source for the Auxiliary Feedwater System. Include when it is automatically supplied, and how to isolate it

18	Points: 1.00

Both units are at 100% power with the following plant conditions on Unit 1:

Voltage Regulator	ON
Generator Field Amps	110 and RISING
Generator Field Forcing alarm	LIT

The Unit 1 NSO will...

A. place the Voltage Regulator to OFF and LOWER the field amps to <100 using the VOLTAGE ADJUSTER.

B. place the Voltage Regulator to OFF and LOWER the field amps to <100 using the BASE ADJUSTER.

C. leave the Voltage Regulator in ON and LOWER the field amps to <100 using the BASE ADJUSTER.

D. leave the Voltage Regulator in ON and LOWER the field amps to <100 using the VOLTAGE ADJUSTER.

Answer: B

Answer Explanation:

A is incorrect: The Voltage Adjuster is used for normal operations, but has apparently failed because output voltage is rising.

B is CORRECT: The correct answer is contained in BAR 1-19-B6 which states to shift the auto voltage regulator to off and then use the Base Adjuster to reduce field current to <100 amps. The reason for this is to prevent a turbine/generator/reactor trip if >P-8 or turbine/generator if <P-8.

C is incorrect: The voltage regulator must be turned off, and the Base Adjuster is used to control excitation when the VR is off.

D is incorrect: The voltage regulator must be turned off. With the VR in ON, the Base Adjuster will not control voltage, and given the conditions, the Voltage Adjuster will not work.

Question 18 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28636
User-Defined ID:	
Cross Reference Number:	
Topic:	Field forcing
Num Field 1:	3.8
Num Field 2:	3.7
Text Field:	077AA1.03
Comments:	Source: Bank Cognitive Level: High Reference: BAR 1-19-B6, Generator Field Forcing K/A 077AA1.03 Generator Voltage and Electric Grid Disturbances: Ability to operate and/or monitor the following as they apply to Generator Voltage and Electric Grid Disturbances: Voltage Regulator Controls. Question meets K/A - Candidate must demonstrate the ability to properly operate the Voltage Regulator given indications of a problem with Generator Voltage. 10CFR55.41(b)(5)

Associated objective(s):

Given the Main Generator is connected to the grid with the WTA Voltage Regulator in automatic control, PREDICT how the Main Generator Excitation System will respond to the following: Failure of the WTA Voltage Regulator

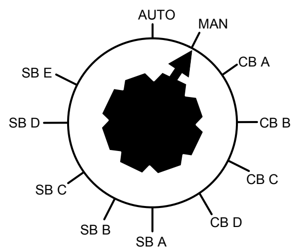
19	Points: 1.00

Unit 1 is at 95%.

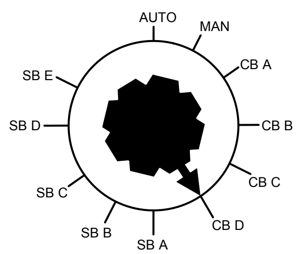
- Control Bank D rods are stepping out because of a failure of the Master Cycler in the Rod Control System.

To which position must the NSO place the Rod Bank Select Switch to remove the Master Cycler from control?

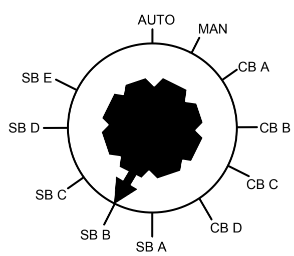
A.



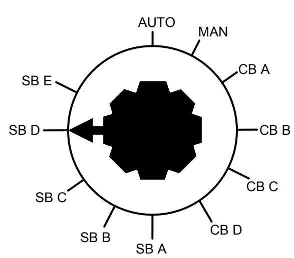
B.



C.



D.



Answer: D

Answer Explanation:

A is incorrect: The Master Cycler is still in the control circuit in Manual.

B is incorrect: The Master Cycler is still in the control circuit in CB D.

C is incorrect: The Master Cycler is still in the control circuit in SB B.

D is CORRECT: The Master Cycler is part of the rod control circuit in Auto, Manual, and bank select for CB A, CB B, CB C, CB D, SB A and SB B. SB C, D and E have a separate pulser-oscillator which has no Master Cycler.

Question 19 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28668
User-Defined ID:	
Cross Reference Number:	
Topic:	Rod select switch for uncontrolled rod withdrawal
Num Field 1:	3.5
Num Field 2:	3.2
Text Field:	001AA1.01
Comments:	Source: New 3/7/2014 RFP Cognitive Level: High Reference: 1BOA ROD-1 K/A 001AA1.01 Continuous Rod Withdrawal - Ability to operate and/or monitor the following as they apply to the CRW: Bank Select Switch. Question meets K/A – Candidate must have the ability to operate the Rod Bank Select Switch in the proper way, for the proper reason, with an Uncontrolled Rod Withdrawal. 10CFR55.41(b)(7)

Associated objective(s):

Given a set of plant conditions or parameters indicating Uncontrolled Rod Motion, DISCUSS the operator actions required to be promptly performed to stabilize the plant or mitigate the consequences of the event or casualty

20 **Points: 1.00**

The BST for Inventory was evaluated for the following indications:
- RVLIS < 100%
- Pzr Level > 17%.

BFR I.3, "Response to Voids in Reactor Vessel" was directed by the status tree.

If this should happen when performing a natural circulation cooldown...

A. it is crucial that BFR I.3 is IMMEDIATELY entered so that the vessel void doesn't interfere with natural circulation.

B. BFR I.3 MUST be performed as time permits, to ensure long term cooling is available.

C. BFR I.3 should <u>NOT</u> be performed because the natural circulation procedure will address actions to operate with the void.

D. it is important that BFR I.3 <u>NOT</u> be used, since the actions performed have the potential to cause core uncovery when in natural circulation.

Answer: C

Answer Explanation:

A is incorrect: This is a logical conclusion in that an uncontrolled void would interfere with natural circulation. However, the natural circulation procedure addresses it.

B is incorrect: Ordinarily this BFR would be done as time permits, but the background document specifically states it should not be used in this situation.

C is CORRECT: The background document states the BFR I.3 should not be used, because voiding may occur and the procedure will address the problem.

D is incorrect: If the candidate does not understand the intent and relationship between BFR I.3 and BEP ES-0.2, they could conclude that core uncovery could result.

Question 20 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	8614
User-Defined ID:	
Cross Reference Number:	
Topic:	vessel void during natural circ
Num Field 1:	4.0
Num Field 2:	4.6
Text Field:	028G2.4.21
Comments:	Source: Bank Cognitive Level: Memory Reference: 1BST-6, 1BEP ES-0.2 K/A 028G2.4.21 Pressurizer Level Malfunction: 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. Question meets K/A - The safety function of RCS Inventory is assessed by Byron Status Trees; there are no paths higher than "yellow". This questions tests the candidates' knowledge of the logic used to decide on a course of action that coordinates and prioritizes the functional restoration procedures and emergency procedures. 10CFR55.41(b)(5)

Associated objective(s):

DISCUSS the steps required to restore the critical safety function to within specifications

STATE the basis for the actions described in steps, notes, and cautions

21 **Points: 1.00**

A low flow liquid release is in progress through 0WX896, Release Tank Outlet Valve.

- 0PR001 Liquid Radwaste Effluent Rad Monitor is in HIGH ALARM for the Release Tank discharge header.
- After 30 seconds, the discharge header high radiation condition cleared.

An operator was observing 0WX896 during the transient. With NO operator action, the 0WX896 valve...

A. closed after a 15 second time delay, then 0WX896 reopened when the high radiation condition cleared.

B. closed after a 15 second time delay, and operator action is required to reopen 0WX896.

C. immediately closed, then 0WX896 reopened when the high radiation condition cleared.

D. immediately closed, and operator action is required to reopen 0WX896.

Answer: D

Answer Explanation:

A is incorrect: There is no time delay for the valve to close, although a time delay is a common practice to prevent spurious short-duration perturbations in a signal from needlessly affecting system operation. When the condition clears, the CW blowdown reset PB is depressed at 0PL01J to allow the valves to be reopened. Some automatic actions self-restore after the initiating signal has cleared, but not this valve.

B is incorrect: There is no time delay for the valve to close, although a time delay is a common practice to prevent spurious short-duration perturbations in a signal from needlessly affecting system operation.

C is incorrect: When the condition clears, the CW blowdown reset PB is depressed at 0PL01J to allow the valves to be reopened.

D is CORRECT: 0RE-PR001 closes 0WX353 and 0WX896 will autoclose on high radioactivity or low blowdown flow.

Question 21 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28637
User-Defined ID:	
Cross Reference Number:	
Topic:	WX valve autoclosure
Num Field 1:	3.6
Num Field 2:	3.9
Text Field:	059AA2.05
Comments:	Source: Bank Cognitive Level: Memory Reference: BOP WX-120, 6E-0-4030WX179 K/A 059AA2.05 Accidental Liquid Release: The occurrence of automatic safety actions as a result of a high PRM system signal. Question meets K/A - Candidate must know the interlock design for high radiation in a release. 10CFR55.41(b)(11)

<u>Question 21 Table-Item Links</u>

<u>LORT Question References</u>

K A #1 - 068000A302RO - 3.6 SRO - 3.6

SYS - 4030 WX179

Associated objective(s):

Given the appropriate procedure and plant parameters, DESCRIBE the "Operating Section" for a Liquid Release

22	Points: 1.00

Both Units are at 100% power.

An electrical fire has required evacuation of the Main Control Room.

- 0/1/2BOA PRI-5, Control Room Inaccessibility were entered by both units.
- The Unit 2 NSO tripped the Unit 2 reactor. While verifying the Unit 2 reactor trip, the NSO saw automatic SI had actuated on Unit 2.
- At that point, all personnel had to leave the Main Control Room.
- At the Remote Shutdown Panel, the Unit 2 Supervisor and NSO have determined the Unit 2 SI was spuriously actuated.

The Unit 2 Safety Injection __(1)__ be terminated by steps in 2BOA PRI-5, ______(2)_____.

	____(1)____	__________________(2)__________________
A.	WILL	because the indications and controls used in the emergency procedures are NOT available at the Remote Shutdown Panel.
B.	WILL	without checking for ECCS termination criteria, because 2BOA PRI-5 is written assuming NO SI will be required.
C.	will NOT	because the indications and controls used in the emergency procedures ARE available at the Remote Shutdown Panel.
D.	will NOT	because the procedure assumes NO SI in is progress and 2BOA PRI-5 contains NO SI termination steps.

Answer: A

Answer Explanation:

A is CORRECT: BEP procedures are not designed to work outside the MCR, and BOA PRI-5 contains the relevant SI termination evaluation and direction.

B is incorrect: BOA PRI-5 does check ECCS termination criteria at ATT F step 3.

C is incorrect: BOA PRI-5 does terminate SI, and the RSDP does not have EOP controls and indications.

D is incorrect: BOA PRI-5 does terminate SI, and does contain the necessary steps.

Question 22 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	17539
User-Defined ID:	
Cross Reference Number:	
Topic:	PRI-5 with SI
Num Field 1:	4.2
Num Field 2:	4.5
Text Field:	068AK3.18
Comments:	Source: New 2/13/14 RFP Cognitive Level: High Reference: 2BOA PRI-5 K/A 068AK3.18 Knowledge of the reasons for the following responses as they apply to the Control Room Evacuation: Actions contained in EOP for control room evacuation emergency task. Question meets K/A - Candidate must evaluate the situation and understand the reasons the BOA and BEP actions are as written. 10CFR55.41(b)(10)

Associated objective(s):

Given a set of plant conditions or parameters indicating a Control Room Inaccessibility condition and a set of plant procedures, IDENTIFY the correct procedure(s) to be utilized and DESCRIBE required operator actions

23	Points: 1.00

Unit 1 experienced an inadvertant manual Safety Injection.
- NO automatic SI signal is present.

What action(s) must be performed to close (and have stay closed) Cent Charging Pump Cold Leg Injection Valves 1SI8801A/B to allow alignment of normal charging?

A. The control switches must be taken to the CLOSE position ONLY.

B. SI must be RESET, then the valves will automatically CLOSE.

C. The reactor trip breakers must be cycled prior to taking the control switches to CLOSE position.

D. SI must be RESET prior to taking the control switches to CLOSE position.

Answer: D

Answer Explanation:

A is incorrect: Some valves and components can be reset or stopped with an initiating signal present; for example: SI signal can be blocked and reset with the initiating signal still present.

B is incorrect: Some valves will automatically reposition when the initiating signal is removed, for example, SI miniflow valves will reposition when SI is reset.

C is incorrect: Some valves and signals require P-4 to be reset: Feedwater Isolation.

D is CORRECT: If SI is not reset, the valves will close, but will immediately stroke back open.

Question 23 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	16839
User-Defined ID:	
Cross Reference Number:	
Topic:	Reclosing SI injection valves
Num Field 1:	3.4
Num Field 2:	3.9
Text Field:	E02EK2.1
Comments:	Source: Bank Cognitive Level: Memory Reference: 6E-1-4030SI06 K/A E02EK2.1 SI Termination: Knowledge of the interrelations between SI Termination an the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features. Question meets K/A - Candidate must know the signals that must be reset to allow control of components when terminating SI. 10CFR55.41(b)(7)

Associated objective(s):

DESCRIBE the Sequence of Events that occur on a Safety Injection to include: What valves reposition

Unit 1 was at 100% power.

- Unit 1 was manually tripped and an automatic Safety Injection and Main Steam Line Isolation occurred.
- 1BEP ES-1.1, SI Termination has been completed.
- The crew has identified the 1A Steam Generator (SG) is at 5% NR level and 1270 PSIG, and is implementing 1BFR H.2, Response to Steam Generator Overpressure.
- 1B - 1D SGs are all at 40% NR level and 1175 PSIG.

The crew will...

A. open 1MS018A, 1A SG PORV.

B. open ALL MSIVs and dump steam from ALL steam generators using the Condenser Steam Dumps.

C. open ONE 1A SG Safety Valve locally.

D. feed 1A SG at maximum rate until 1A SG level is within 10% - 50% NR level.

Answer: A

Answer Explanation:

A is CORRECT: 1A SG PORV can be used to dump steam from the affected SG (1A SG).

B is incorrect: MSIVs are not opened, and if an MSIV bypass were to be opened, it is only for the affected 1A SG.

C is incorrect: SG safety valves are not opened manually when the SG is at pressure; they are opened in SD conditions manually for testing.

D is incorrect: AF flow is maximized in the case of a loss of heat sink, and the stated levels are the normal post trip control levels.

Question 24 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28639
User-Defined ID:	
Cross Reference Number:	
Topic:	AF for SG overpressure
Num Field 1:	3.0
Num Field 2:	3.2
Text Field:	E13AK2.2
Comments:	Source: New 2/14/14 RFP Cognitive Level: High Reference: 1BFR-H.2 K/A E13AK2.2 Steam Generator Overpressure: Knowledge of the interrelations between the Steam Generator Overpressure and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility. Question meets K/A - Candidate must know the methods available and allowed to remove heat from a SG in an overpressure condition. 10CFR55.41(b)(4)

Associated objective(s):

Given a set of plant conditions, DIAGNOSE and ANALYZE a Response to Steam Generator Overpressure

25	Points: 1.00

Unit 1 had an automatic reactor trip and safety injection in response to a RCS LOCA.

Several days later, the crew has aligned Post LOCA purge to lower containment radiation levels. While the purge is in progress, Area Radiation Monitor 1AR011J goes to HIGH ALARM status.

The Post LOCA Purge Unit Filter is...

A. isolated when 1VQ003 (only) closes.

B. isolated when 1VQ005A (only) closes.

C. isolated when both 1VQ003 and 1VQ005A close.

D. NOT isolated because NEITHER 1VQ003 or 1VQ005A close.

Answer: B

Answer Explanation:

A is incorrect: 1VQ003 is interlocked with 1AR012J (train B) which is not stated to be in alarm in the stem of the question.

B is CORRECT: 1VQ005A is interlocked with 1AR011J to shut on high radiation in the area.

C is incorrect: 1VQ003 is not interlocked with 1AR011J, but because of the odd number, the candidate may assume it is.

D is incorrect: The candidate may logically assume that the "Post LOCA" filter unit would not be isolated on high radiation in containment, so that containment radiation could be reduced via this flowpath.

Question 25 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28638
User-Defined ID:	
Cross Reference Number:	
Topic:	CNMT Purge isolation
Num Field 1:	3.1
Num Field 2:	3.2
Text Field:	E16AA1.1
Comments:	Source: New 2/13/14 RFP Cognitive Level: High Reference: BOP VQ-7. BOP AR/PR-11T1 K/A E16AA1.1 High Containment Radiation: Ability to operate and/or monitor the following as they apply to the Containment High Radiation: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features. Question meets K/A - Candidate must be able to determine the function of the interlocks and automatic features to isolate containment under a high radiation condition. The candidate must analyze the given condition that only one train has performed an interlock function to know if and how the isolation occurred. 10CFR55.41(b)(9)

Associated objective(s):

DESCRIBE the systems and flow paths that can be used to control containment pressure

26	Points: 1.00

Unit 1 had a reactor trip and safety injection, due to a small break RCS LOCA.

- 1BEP ES-1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION is in progress at step 23 to "Check if SI accumulators should be isolated."

A failure to isolate the SI accumulators would lead to...

A. loss of RCS inventory from backfill to the accumulators.

B. overfill of the Pressurizer because of excess water injection from the accumulators.

C. loss of natural circulation capabilities due to nitrogen collecting in Steam Generator U-tubes.

D. excessive RCS cooldown due to cold accumulator water injection.

Answer: C

Answer Explanation:

A is incorrect: Accumulators will not backfill from the RCS, but this is a concept from a SGTR accident that the candidate may confuse.

B is incorrect: Accumulators may fill the Pressurizer, but that would not be an "overfill" and is not a reason to isolate them.

C is CORRECT: The SG U-tubes are are the high point in the primary system where gasses may collect. Gasses in the U-tubes would prevent water flow and heat transfer for natural circulation.

D is incorrect: The accumulators have already injected most of their contents and the remaining water would not cooldown.

Question 26 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28640
User-Defined ID:	
Cross Reference Number:	
Topic:	Isol accum in Post LOCA cooldown
Num Field 1:	3.4
Num Field 2:	4.0
Text Field:	E03AK1.1
Comments:	Source: Bank Cognitive Level: Memory Reference: Background for 1BEP ES-1.2 K/A E03AK1.1 LOCA Cooldown and Depressurization: Knowledge of the operational implications of the following concepts as they apply to the LOCA Cooldown and Depressurization: Components, capacity, and function of emergency systems. Question meets K/A - Candidate must know the operational consequences of the operation of the accumulators when they function in their emergency role. 10CFR55.41(b)(8)

Associated objective(s):

Given a copy of the Post-LOCA Cooldown and Depressurization Procedure, DISCUSS the basis of each step, note or caution in the procedure

27 **Points: 1.00**

Unit 1 has a natural circulation cooldown in progress per 1BEP ES-0.2 Natural Circulation Cooldown.

- RHR has just been placed in the shutdown cooling mode.

At this point, the operators will...

A. stop dumping steam from all S/G's because RHR cooling will sufficiently cool the steam generators.

B. stop dumping steam from all S/G's because the thermal difference caused by dumping steam will interfere with RHR forced circulation.

C. continue dumping steam from all S/G's to cool the S/G's to prevent voiding in the S/G tubes.

D. continue dumping steam from all S/G's to assist in core heat removal, since RHR cooling alone is not sufficient to remove decay heat generation.

Answer: C

Answer Explanation:

A is incorrect: Operators will continue to dump steam. RHR cooling won't cool the SG tubes very effectively.

B is incorrect: Operators will continue to dump steam. Steaming the SG won't interfere with RH flow.

C is CORRECT: Per the procedure, the operators will continue to dump steam to cool the SG U-tubes.

D is incorrect: RHR flow is sufficient to cool the RCS after the SG cooling is secured.

Question 27 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	8615
User-Defined ID:	
Cross Reference Number:	
Topic:	SG cooldown while on RH cooling
Num Field 1:	3.4
Num Field 2:	3.8
Text Field:	E09EA2.2
Comments:	Source: New 3/10/14 RFP Cognitive Level: Memory Reference: 1BEP ES-0.2 K/A E09EA2.2 - Natural Circulation Operations - Ability to determine and interpret the following as they apply to Natural Circulation Operations: Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments. Question meets K/A – Candidate must have the ability to adhere to the procedures for natural circulation cooldown. 10CFR55.41(b)(5)

Associated objective(s):

GIVEN a set of plant conditions, DIAGNOSE and ANALYZE a Natural Circulation Cooldown

28	Points: 1.00

Unit 1 is in MODE 3 at NOP and NOT.

- "1D" RCP experiences high temperatures and is stopped.

Which ONE of the following describes how flow is affected by stopping the pump?

A. Flow through the running RCPs increase.

B. Flow through the idle loop will increase.

C. Total loop flow will decrease below 75% of previous flow.

D. Total RCS core flow will stay the same.

Answer: A

Answer Explanation:

A is CORRECT: System head loss will lower, so flow through the running RCPs rises, going through the core and now also backwards through the idle loop.

B is incorrect: There will be lower, reverse flow through the idle loop.

C is incorrect: Total loop flow will rise, because there is now another flowpath: through the idle loop.

D is incorrect: Core flow will lower, since some flow will bypass the core through the idle loop.

Question 28 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	6894
User-Defined ID:	
Cross Reference Number:	
Topic:	RCS flowrates with tripped RCP
Num Field 1:	2.8
Num Field 2:	3.0
Text Field:	003K5.05
Comments:	Source: Bank Cognitive Level: High Reference: Byron ILT System Lesson Plan I1-RC-XL-02/Chapter 13: Reactor Coolant Pump K/A 003K5.05 Reactor Coolant Pump System - Knowledge of the operational implications of the following concepts as they apply to the RCPS: The dependency of RCS flow rates upon the number of operating RCPs Question meets K/A - Candidate must analyze the change in system head, consider whether the idle loop flowrate lowers or stops, and realize the core experiences bypass flow. 10CFR55.41(b)(5)

Associated objective(s):

ANALYZE and PREDICT the effect that a loss of (a) Reactor Coolant Pumps will have on the following: RCS Loop Flows, Temperatures

29	Points: 1.00

Unit 1 is at 100% power.

- 0B PW Make-up Pump is running.
- 0A PW Makeup Pump is in standby.
- An automatic makeup to the VCT occurs, and the 0B PW Makeup Pump subsequently trips.

What is the result of this event if NO operator action is taken?

A. Only boric acid flow will continue, and VCT level rise will stop at 55%.

B. 0A PW pump will be running, and VCT level rise will stop at 55%.

C. 0A PW pump will be running, and VCT level rise will stop at 73%.

D. The Boric Acid Transfer Pump will trip when alarm 1-9-B6, PW FLOW DEVIATION comes in.

Answer: B

Answer Explanation:

A is incorrect: 0A PW makeup pump will start and maintain blended makeup flow, not just boric acid flow.

B is CORRECT: The 0A PW Makeup pump is interlocked to start whenever PW flow is demanded by the RMCS from Unit 1 (0B pump is interlocked with Unit 2 RMCS). So when the auto makeup initiated, the 0A PW Makeup pump started. When the 0B Pump tripped, there was NO major perturbation in flow (CV-111A will throttle to provide required PW flow. The auto makeup will terminate when VCT level reaches to 55%.

C is incorrect: 0A PW pump will start, but auto makeup will stop at the normal band - 55%. 73% is the beginning of the HUT divert band, which the candidate may think stops the makeup or that makeup continues until diversion begins.

D is incorrect: On a PW/Total flow deviation existing for 30 seconds, an alarm is received and valves CV-110B and CV-111B would close. BATP Pump (if auto started by RMCS) will continue to run until the VCT level demand has cleared.

Question 29 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	16874
User-Defined ID:	
Cross Reference Number:	
Topic:	VCT makeup
Num Field 1:	3.1
Num Field 2:	3.1
Text Field:	004K1.06
Comments:	Source: Modified from Bank Cognitive Level: High Reference: BOP CV-7 K/A 004K1.06 Knowledge of the physical connections and/or cause-effect relationships between the CVCS and the following systems: Makeup system to VCT. Question meets K/A - Candidate must know the automatic functions of the Reactor Makeup Control System and apply the knowledge to the stated situation. 10CFR55.41(b)(5)

Associated objective(s):

LIST the sources of pure water and boric acid.

EXPLAIN the pure water and boric acid flowpaths (as applicable) through the RMCS, and the reason for each flowpath, for the following system conditions: Automatic or Manual Operation

DESCRIBE the operation of the boric acid blender, boric acid flow controller/totalizer, and the primary water flow controller/totalizer.

30	Points: 1.00

Unit 1 is in MODE 5.

- 1A Train RH is in shutdown cooling mode.
- RCS temperature is being maintained at 180°F.
- RCS pressure is 350 PSIG.

Which ONE of the following would indicate a tube leak in the 1A RH Heat Exchanger?

A. INCREASING RH return flow to the RCS

B. DECREASING RH system boron concentration

C. LOWERING CC Surge Tank level

D. LOWERING Pressurizer level

Answer: D

Answer Explanation:

A is incorrect: If candidate thinks CC leaks into RH, the discharge flow would be thought to rise.

B is incorrect: Boron concentration would change slightly if CC leaked into the RCS. RH pressure is higher than CC pressure, so leakage will be into CC.

C is incorrect: RH leaks into CC system, so CC surge tank level will rise.

D is CORRECT: RH leaks out of the RCS into the CC system, so Pzr level will lower.

Question 30 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28642
User-Defined ID:	
Cross Reference Number:	
Topic:	Effect of RHR HX tube leak
Num Field 1:	2.5
Num Field 2:	2.6
Text Field:	005K6.03
Comments:	Source: Modified from bank question # 16812 Cognitive Level: High Reference: 1BOA PRI-7 K/A 005K6.03 Knowledge of the effect of a loss of malfunction of the following on the Residual Heat Removal System: RHR Heat Exchanger Question meets K/A - Candidate must analyze the relative pressures of the RH and CC system to know there will be leakage out of the RCS through the RH heat exchanger, which will cause Pzr level to lower. 10CFR55.41(b)(3)

Associated objective(s):

DISCUSS the purpose and operation of the following component: RH Heat Exchanger

31	Points: 1.00

What are the power supplies to the SI Accumulator Isolation Valves?

	1SI8808A	1SI8808B
A.	131X2A	131X2A
B.	132X2A	132X2A
C.	132X2A	131X2A
D.	131X2A	132X2A

Answer: D

Answer Explanation:

A is incorrect: Candidate may consider that A & B, and C & D have same power supplies.

B is incorrect: Typically power supplies are alternated even and odd with trains, making this plausible.

C is incorrect: Candidate may remember the "insides" and "outsides" have same supplies making this a plausible choice.

D is CORRECT: This is the correct power supply lineup, but is unusual in the the A & D are from Div 11 and B & C are from Div 12 power supplies.

Question 31 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28643
User-Defined ID:	
Cross Reference Number:	
Topic:	Accum Isol valve power supplies
Num Field 1:	2.5
Num Field 2:	2.9
Text Field:	006K2.02
Comments:	Source: New 2/17/2014 RFP Cognitive Level: Memory Reference: BOP SI-E1 K/A 006K2.02 Emergency Core Cooling System - Knowledge of bus power supplies to the following: Valve operators for accumulators. Question meets K/A - Candidate must remember the power supplies to the accumulator isolation valves. 10CFR55.41(b)(7)

Associated objective(s):

DESCRIBE the Accumulators and the RWST including: Construction

32	Points: 1.00

Which of the following parameters indicates that the PRT rupture disk has ruptured following a Pressurizer PORV failing OPEN?

A. Pressurizer pressure LOWERING

B. Relief line temperatures RISING

C. PRT temperature LOWERING

D. Pressurizer level LOWERING

Answer: C

Answer Explanation:

A is incorrect: Pzr pressure will not lower, because the PORV is controlled by Pzr pressure. If pressure lowers, PORV will close.

B is incorrect: Relief line temperatures will lower, if there is any change at all, when the PRT ruptures. They rose when the PORV opened.

C is CORRECT: The PRT is a saturated system, so when it ruptures at 100 PSIG, it will go to CNMT pressure and temperature will lower accordingly.

D is incorrect: Any change in Pzr level will be affected very little, if at all, by the PRT rupturing.

Question 32 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	14035
User-Defined ID:	
Cross Reference Number:	
Topic:	PRT temperature
Num Field 1:	2.6
Num Field 2:	2.7
Text Field:	007A1.03
Comments:	Source: Bank Cognitive Level: High Reference: Byron ILT System Lesson Plan I1-RY-XL-01, Pressurizer K/A 007A1.03 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the Pressurizer Relief Tank System controls including: Monitoring quench tank temperature. Question meets K/A - Candidate must understand the relationship between Psat and Tsat, and predict the qualitative change in the temperature in the PRT when the pressure changes. 10CFR55.41(b)(14)

Associated objective(s):

STATE the normal operating pressure, temperature, and level of the PRT

LIST the sources which discharge into the PRT

STATE the internal design pressure of the PRT. DISCUSS how the PRT is protected from exceeding this pressure

33	Points: 1.00

Unit 2 is at 100% power.

- RCS leakage has been detected.
- A leaking Pressurizer PORV is suspected.

The specific Unit 2 PZR PORV that is leaking can be identified by checking Unit 2...

A. RCDT level trending NORMALLY after closing a Unit 2 PORV block valve.

B. VCT level trending NORMALLY after closing a Unit 2 PORV block valve.

C. PORV temperature on MCB indication RISING with both PORV block valves OPEN.

D. PRT temperature and pressure RISING with both PORV block valves OPEN.

Answer: B

Answer Explanation:

A is incorrect: PORVs discharge to the PRT, not the RCDT. There will be no change to the RCDT whether or not a block valve is shut.

B is CORRECT: VCT level will slowly lower because of the RCS leakage through the PORV. Closing the block valve on the leaking PORV will stop that leakage and hence identify the leaking PORV.

C is incorrect: Tailpipe temperature is common to both PORVs.

D is incorrect: PRT is common to both PORVs.

Question 33 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	8686
User-Defined ID:	
Cross Reference Number:	
Topic:	Identifying leaking PORV
Num Field 1:	3.6
Num Field 2:	3.8
Text Field:	007A4.10
Comments:	Source: Bank Cognitive Level: High Reference: P&ID M-135, sheet 5 K/A 007A4.10 Ability to manually operator and/or monitor in the control room: Recognition of leaking PORV/code safety. Question meets K/A - Operator must be able to differentiate what method will identify a leaking PORV using control room indications supplied. 10CFR55.41(b)(7)

Associated objective(s):

STATE the function of the Motor Operated Isolation Valves, and DISCUSS when they would be used

34	Points: 1.00

Unit 1 was just shutdown for a refueling outage after 500 days of continuous operation.

- CC and SX are aligned to provide maximum cooling.
- At 0650 the first train of RH is initially placed in shutdown cooling.
- At 0700 CC Heat Exchanger outlet temperature reaches 100°F and is RISING at 1°F per minute at a constant rate.

When will the CC Heat Exchanger outlet temperature initially reach the maximum permitted temperature limit?

A. 0705

B. 0720

C. 1005

D. 1020

Answer: B

Answer Explanation:

A is incorrect: 0705 is plausible as at 0705 we will reach the normal design limit of 105 degrees.

B is CORRECT: Per a statement in BOP CC-1 and T.S. Bases of 3.7.7 (pg.3), the normal design temperature of CC is 105 degrees. Temperature may be allowed to go to 120 degrees not to exceed a 3 hour time frame. The correct answer is correct based on 20 minutes time to reach 120 degrees.

C is incorrect: 1005 is plausible based on the 3 hour time limit after reaching 105 degrees but you would be greater than 120 degrees which is not permissible.

D is incorrect: 1020 is plausible based on the same logic used above accept that this includes the time necessary to reach 120 degrees.

Question 34 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28289
User-Defined ID:	
Cross Reference Number:	
Topic:	CC temperature rise
Num Field 1:	2.9
Num Field 2:	3.1
Text Field:	008A1.02
Comments:	Source: 2012 Byron NRC exam Cognitive Level: High Reference: BOP CC-1 K/A 008A1.02 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CCWS controls including:CCW temperature Question meets K/A - Candidate must calculate the time to reach the temperature limit for CC; this is a prediction of the change in temperature. 10CFR55.41(b)(5)

Associated objective(s):

DESCRIBE plant critical parameters and system response to using the RH Heat Exchanger including effects on the CC System

35 **Points: 1.00**

Both Units are at 100% power

- The Unit 0 CC pump and heat exchanger is aligned to Unit 2.
- The Unit 0 CC pump is not running.

What action (if any) is required if the Unit 0 CC Pump is determined to be inoperable?

A. No action is required because the CC LCO is satisfied for BOTH units.

B. Enter 3.0.3 for BOTH units.

C. Enter the LCOAR for LCO 3.7.7, Component Cooling Water, for Unit 2 ONLY.

D. Enter the LCOAR for LCO 3.7.7, Component Cooling Water, for BOTH units.

Answer: A

Answer Explanation:

A is CORRECT: With the Unit 0 CC Pump inoperable, the LCO is still met even though it is a "shared" component that affects both Units. As long as the Unit-specific Pumps remain operable, the CC system is operable with TWO flow paths operable. Alignment of valves as necessary is considered in the Safety Analysis.

B is incorrect: If the Unit 0 CC pump were substituting for one of the Unit 1 CC pumps, this would be correct.

C is incorrect: This would be correct for a failure of the Unit 0 CC heat exchanger, because both units rely on it as a second flowpath.

D is incorrect: This would be correct in many cases for a failure that affect 2 trains or both units, as the candidate could assume since the Unit 0 CC train is capable of supporting either unit.

Question 35 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	9183
User-Defined ID:	
Cross Reference Number:	
Topic:	TS 3.7.7 (CC) entry evaluation
Num Field 1:	3.9
Num Field 2:	4.6
Text Field:	008G2.2.42
Comments:	Source: Bank Cognitive Level: High Reference: TS 3.7.7 K/A 008G2.2.42 Component Cooling System: Ability to recognize system parameters that are entry-level conditions for Technical Specifications. Question meets K/A - Candidate must recognize that in this case, the LCO for TS 3.7.7 is fully met. This is a plausible question because the candidates are used to questions that involve failures that require an action because the LCO is not fully met. 10CFR55.41(b)(7)

Associated objective(s):

Given applicable reference material, ANALYZE a given set of plant conditions and DETERMINE Component Cooling Water Tech Spec/TRM operability requirements.

36 **Points: 1.00**

Unit 1 is at 100% power.

- A control valve failure caused pressurizer level to lower to 10%.
- Pressurizer level has subsequently been recovered to the program level.

The Variable Pressurizer Heaters (Group C) will remain DE-ENERGIZED until...

A. the control switch for the heaters is momentarily placed to the CLOSE position.

B. the MCC breaker for the heaters is LOCALLY reclosed.

C. level reaches NORMAL program level.

D. the level bistable is manually reset.

Answer: A

Answer Explanation:

A is CORRECT: The control switch for the variable heaters must be cycled back to CLOSE to turn them back on.

B is incorrect: The breaker did not trip open so does not have to be reset locally.

C is incorrect: Variable heaters must be turned back on, although the backup heaters will re-energize automatically when level is restored if there is a demand signal for them.

D is incorrect: The level bistable resets itself when level is restored.

Question 36 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	2845
User-Defined ID:	
Cross Reference Number:	
Topic:	Pzr level interlock
Num Field 1:	3.0
Num Field 2:	3.9
Text Field:	010K4.02
Comments:	Source: Bank Cognitive Level: High Reference: 6E-1-4030RY07 K/A 010K4.02 Knowledge of Pzr Pressure Control System design features and/or interlocks which provide for the following: Prevention of uncovering Pzr heaters. Question meets K/A - Candidate must know the entire control schema for the low Pzr level interlock that protects the Pzr heaters, not just that the heaters are deenergized at low level, but that the heaters must be reset upon restoration of level. Neglect to reset the heaters will interfere with the proper operation of the pressure control system. 10CFR55.41(b)(7)

Associated objective(s):

Concerning the operation of the Pressurizer Heaters: DIFFERENTIATE between back-up and variable heaters referring to function and control setpoints

Concerning the operation of the Pressurizer Heaters: EXPLAIN All Associated Interlocks

Unit 1 was at 100% power.

- Power was lowered because of a secondary system problem.
- RCS pressure has risen to 2265 PSIG.

What is the status of the Pressurizer Spray valves, and the Variable Pzr Heaters (Group C)?

Spray Valves Heaters

A.

B.

C.

D.

Answer: B

Answer Explanation:

A is incorrect: Spray valves start to open at 2260 PSIG increasing, so at 2265 PSIG they are open. Variable heaters shut off at 2250 PSIG increasing.

B is CORRECT: Spray valves start to open at 2260 PSIG increasing, so at 2265 PSIG they are open. Variable heaters shut off at 2250 PSIG increasing.

C is incorrect: Spray valves start to open at 2260 PSIG increasing. Variable heaters shut off at 2250 PSIG increasing.

D is incorrect: Spray valves start to open at 2260 PSIG increasing.

Question 37 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28645
User-Defined ID:	
Cross Reference Number:	
Topic:	Pressure control on downpower (picture)
Num Field 1:	3.6
Num Field 2:	3.5
Text Field:	010A3.02
Comments:	Source: New 2/19/2014 RFP Cognitive Level: High Reference: Byron ILT System lesson plan I1-RY-XL-01, Chapter 14, Pressurizer, pages 8 & 10 K/A 010A3.02 Pressurizer Pressure Control System: Ability to monitor automatic operation of the Pzr PCS including: Pzr Pressure. Question meets K/A - Candidate must know how the Pressurizer Pressure Control System automatically operates during a normal power and pressure change, and must evaluate the situation and apply that knowledge to determine the status of the stated pressure control components. 10CFR55.41(b)(7)

Associated objective(s):

Given plant conditions which indicate a change in plant load, EXPLAIN the response of the pressurizer as it functions to maintain pressure

38	Points: 1.00

Which of the following identifies the PRIMARY protection afforded by the Over Power Delta Temperature (OPDT) Trip?

A. DNB

B. Ejected Rod

C. Excessive Kw/ft

D. Startup Accident

Answer: C

Answer Explanation:

A is incorrect: DNB protection is provided by OTDT and Pressurizer pressure low along with parameters that deal primarily with reduced reactor coolant flow.

B is incorrect: Ejected rod accident protection is provided by P.R. High positive rate trip (5% in 2 sec.)

C is CORRECT: The OPDT trip setpoint is PRIMARILY designed to prevent exceeding peak fuel centerline temperature at high power. Secondary functions of OPDT would be to "back-up" the OTDT which would be a DNB function, and PR neutron flux high, which would be an ejected rod function.

D is incorrect: Startup accident protection is provided by S.R., I.R. and P.R low setpoints.

Question 38 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28375
User-Defined ID:	
Cross Reference Number:	
Topic:	OPDT trip
Num Field 1:	3.1
Num Field 2:	3.3
Text Field:	012K5.02
Comments:	Source: Bank Cognitive Level: Memory Reference: UFSAR page 7.2-5 K/A 012K5.02 Reactor Protection System Knowledge of the operational implications of the following concepts as the apply to the RPS: Power density Question meets K/A - Candidate must have knowledge of operational implication of concept of power density (Kw/ft) as it relates to the reactor protection system (OPDT Reactor Trip). 10CFR55.41(b)(6)

Associated objective(s):

DESCRIBE the accident that each Reactor Trip protects against

39 **Points: 1.00**

Unit 1 is in MODE 3.

- RCS pressure has been lowered to 1850 psig during a plant cooldown.
- P-11, Pzr Low Pressure SI Block Permissive bypass permissive is LIT and appropriate actions have been taken as required by the shutdown procedure.

Subsequently a steamline break occurs downstream of the MSIVs.

With NO operator action, what is the ESF response to this leak?

A. For a large size break, a steam line isolation will occur, however an SI will **NOT** occur.

B. For a large size break, **BOTH** a steamline isolation and an SI will occur.

C. A steamline isolation will occur on a large OR small break, but an SI will **ONLY** occur on a large break.

D. An SI will occur on a large OR small break, but a steamline isolation will **ONLY** occur on a large break.

Answer: A

Answer Explanation:

A is CORRECT: The Steamline SI signal is procedurally blocked when below P-11. Before being blocked, an SI and a Main Steam line isolation will occur on steamline low pressure or rate of change. After the signal is blocked, the SI is blocked, but a MSLI will occur if there is a rapid lowering of steam line pressure, as will occur on a large break.

B is incorrect: Before being blocked, an SI and a Main Steam line isolation will occur on steamline low pressure or rate of change.

C is incorrect: In some circumstances, an SI will occur with NO Main Steam line isolation, such as High CNMT pressure. High high CNMT pressure will initiate a MSLI.

D is incorrect: As noted for A, a Main Steam line isolation can occur with no SI, on a rate of change such as seen for a large steam line break. A smaller break will not initiate a SI and MSLI.

Question 39 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28646
User-Defined ID:	
Cross Reference Number:	
Topic:	Steamline isolation or SI below P-11
Num Field 1:	2.9
Num Field 2:	3.4
Text Field:	013K1.16
Comments:	Source: Bank Cognitive Level: High Reference: 1BGP 100-5, Plant Shutdown and Cooldown K/A 013K1.16 Engineered Safety Features Actuation System: Knowledge of the physical connections and/or cause effect relationships between the ESFAS and the following systems: MRSS Question meets K/A - Candidate must know the effect of low main steam pressure on the actuation of the ESF system. 10CFR55.41(b)(8)

Associated objective(s):

LIST the setpoints and DESCRIBE coincidences, functions and EXPLAIN how to reset the following ESF Systems/Components following actuation: Safety Injection

40	Points: 1.00

Unit 2 is at 100% power.

- 2A and 2C Reactor Containment Fan Coolers (RCFC) are operating in FAST speed.
- 2B and 2D RCFCs are stopped and in standby.
- Normal cooling water lineup for the RCFCs exists.

What will be the status of the RCFCs 2 minutes after an SI signal occurs concurrent with a loss of offsite power?

A. Only 2B and 2D RCFCs running in SLOW speed with cooling from Containment Chilled Water.

B. Only 2B and 2D RCFCs running in SLOW speed with cooling from Essential Service Water (SX).

C. ALL RCFCs running in SLOW speed with cooling from Containment Chilled Water.

D. ALL RCFCs running in SLOW speed with cooling from Essential Service Water (SX).

Answer: D

Answer Explanation:

A is incorrect: The ESF busses re-energized from the EDGs so all RCFCs have power restored, and cooling shifts from normal CNMT Chilled Water to SX on an SI.

B is incorrect: The ESF busses re-energized from the EDGs so all RCFCs have power restored.

C is incorrect: Cooling shifts from normal CNMT Chilled Water to SX on an SI.

D is CORRECT: The ESF busses re-energized from the EDGs so all RCFCs have power restored, and cooling shifts from normal CNMT Chilled Water to SX on an SI.

Question 40 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	5197
User-Defined ID:	
Cross Reference Number:	
Topic:	RCFC actuation with SI and LOOP
Num Field 1:	4.1
Num Field 2:	4.3
Text Field:	022A3.01
Comments:	Source: Bank Cognitive Level: High Reference: 1BEP-0 K/A 022A3.01 Ability to monitor automatic operation of the Containment Cooling System, including: Initiation of safeguards mode of operation. Question meets K/A - Candidate must evaluate the combination of SI signal with a loss of offsite power to determine how the RCFCs will respond automatically. 10CFR55.41(b)(7)

Associated objective(s):

DESCRIBE the operation of the reactor containment fan coolers during normal operation. Compare/Contrast this with operation during a Loss of Coolant Accident conditions

41 **Points: 1.00**

Unit 1 is at 100% power.

- Pressurizer pressure is 1750 PSIG and slowly lowering.
- NEITHER reactor trip breaker is OPEN.
- SI has NOT automatically actuated.
- NO operator actions have yet been taken.

The NSO will actuate manual...

A. SI and then perform immediate actions of 1BEP-0, Reactor Trip or Safety Injection.

B. SI and then perform immediate actions of 1BFR-S.1, Response to Nuclear Power Generation/ATWS.

C. reactor trip and then perform immediate actions of 1BEP-0, Reactor Trip or Safety Injection.

D. reactor trip and then perform immediate actions of 1BFR-S.1, Response to Nuclear Power Generation/ATWS.

Answer: C

Answer Explanation:

A is incorrect: Manual SI is not implemented yet in 1BEP-0 until step 4, when the reactor is successfully tripped. If the reactor doesn't trip in step 1, then 1BFR S.1 is implemented.

B is incorrect: Manual SI is not implemented yet in 1BEP-0 until step 4, when the reactor is successfully tripped. If the reactor doesn't trip in step 1, then 1BFR S.1 is implemented, but a manual SI is expressly not done in 1BFR S.1.

C is CORRECT: The reactor has failed to automatically trip when pressure lowered below 1885 PSIG, but the manual actions to trip the reactor have not yet been taken, so 1BEP-0 is implemented. Auto SI should have actuated at 1829 PSIG, but did not. Manual SI is not implemented yet in 1BEP-0 until step 4, when the reactor is successfully tripped. If the reactor doesn't trip in step 1, then 1BFR S.1 is implemented, but a manual SI is expressly not done in 1BFR S.1..

D is incorrect: The reactor has failed to automatically trip, but the manual actions to trip the reactor have not yet been taken, so 1BEP-0 is implemented.

Question 41 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28667
User-Defined ID:	
Cross Reference Number:	
Topic:	Directed actions on ATWS with SI
Num Field 1:	3.8
Num Field 2:	4.5
Text Field:	012 G2.4.14
Comments:	Source: New 3/5/2014 RFP Cognitive Level: High Reference: 1BEP-0, 1BFR-S.1 K/A 012 G2.4.14 Reactor Protection System - Knowledge of general guidelines of EOP usage. Question meets K/A - Candidate must determine that an automatic reactor trip failed, and know the actions to be taken. The candidate must know the reason SI is not done yet (not yet at proper step in 1BEP-0, and is not manually done is 1BFR S.1). This is knowledge of general guidelines for EOP usage. 10CFR55.43(b)(5)

Associated objective(s):

Given a set of plant conditions, EVALUATE whether entry into FR-S.1 or S.2 are required

42	Points: 1.00

Unit 1 has experienced an automatic reactor trip, safety injection actuation and containment spray actuation.

- 1BEP-0, Reactor Trip or Safety Injection, is in progress at Attachment B, Step 10.g, "Verify SX Cooling Tower alignment".
- The Unit 2 NSO notified the Unit 1 Supervisor that Bus 241 is faulted and cannot be energized.
- SX Tower Fan 0F tripped and can NOT be started in HIGH speed.
- Outside air temperature is 85°F.

The NSO will close the appropriate riser valve(s) and...

A. open bypass valve 0SX162B.

B. open bypass valves 0SX162B and C.

C. shutdown all but 1 SX pump per unit.

D. shutdown all but 2 RCFCs.

Answer: D

Answer Explanation:

A is incorrect: Bypass valves are all to be closed. Candidate might assume that because the expected response was not obtained, that the correct action is to reopen a bypass valve on Unit 1.

B is incorrect: Bypass valves are all to be closed. Candidate might assume that because the expected response was not obtained, that the correct action is to reopen the bypass valves on the idle cells.

C is incorrect: Candidate may realize the risers and bypass valves from Bus 241 cannot be closed, and decide that SX pump runout must be prevented.

D is CORRECT: Bus 241 supplies SX fans 0C and 0D, and fan 0F was tripped in the stem. Since fewer than 6 SX fans (5) can be run in High speed, only 2 RCFCs are to be run if outside air temperature is >76°F, in accordance with 1BEP-0.

Question 42 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28647
User-Defined ID:	
Cross Reference Number:	
Topic:	RCFC to be stopped on CS
Num Field 1:	3.9
Num Field 2:	4.1
Text Field:	026K3.01
Comments:	Source: New Cognitive Level: High Reference: 1BEP-0 K/A 026K3.01 Containment Spray System: Knowledge of the effect that a loss or malfunction of the CSS will have on the following: CCS (CNMT Cooling System). Question meets K/A - Candidate must evaluate the plant conditions and determine that the CCS is affected by the failures of the cooling system for CNMT Spray system. 10CFR55.41(b)(10)

Associated objective(s):

Given a set of plant conditions or parameters indicating a Safety Injection, and a set of plant procedures, IDENTIFY the correct procedures to be utilized, and DISCUSS required operator actions

43	Points: 1.00

The first stage of the Moisture Separator Reheater uses ____(1)____ for heating, and exhausts to the ___(2)___ Feedwater Heaters.

	______(1)_______	__(2)__
A.	4th Stage Extraction Steam	15A/B
B.	4th Stage Extraction Steam	17A/B
C.	Main Steam	15A/B
D.	Main Steam	17A/B

Answer: A

Answer Explanation:

A is CORRECT: HP turbine 4th stage extraction steam goes to the first stage reheat of the MSR and 15 heater.

B is incorrect: Main steam goes to the 17 heater.

C is incorrect: Main steam goes to the MSR 2nd stage.

D is incorrect: Main steam goes to the MSR 2nd stage, and to the 17 heater.

Question 43 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	14121
User-Defined ID:	
Cross Reference Number:	
Topic:	MSR supply from TG
Num Field 1:	2.5
Num Field 2:	2.6
Text Field:	039K1.05
Comments:	Source: Bank Cognitive Level: Memory Reference: Byron ILT System lesson plan - Main Turbine and Reheaters, I1-MT-XL-01 K/A 039K1.05 Main and Reheat Steam System - Knowledge of the physical connections and/or cause-effect relationships between the MRSS and the following systems: T/G (Turbine Generator). Question meets K/A - Candidate must know how the reheat steam system is connected to the Main Turbine. 10CFR55.41(b)(5)

Associated objective(s):

SKETCH a one line diagram of the 1st and 2nd Stage Moisture Separator Reheater Steam System and label the Moisture Separator Reheater, 2nd Stage Reheat Steam Supply, 1st Stage Reheat Steam Supply, Hot and Cold Reheat Headers and Relief Valves, Start-up Purge Valves (MS067), Shut-off Valves (MS009), Reheat Control Valves (MS010, MS147) and Bypass (MS068), Leak-off Valves (MS114, MS115), Extraction Steam Supply Valves (ES56) and Bypass (ES57) and the Non Return Check Valves (ES062)

Unit 1 is at 20% power, raising power after a refueling outage.

- 1C Turbine Driven Feedwater pump is in service.
- 1A Steam Generator (SG) level rose to 90% NR level due to a Feedwater Flow instrument malfunction.
- 1B, 1C and 1D SG levels remained at normal program level.
- The NSO switched controlling Feedwater Flow channels for the 1A SG.

The crew will immediately...

A. reset the Feedwater Isolation signal and restore 1A SG to normal level.

B. respond to the Main Turbine trip and stabilize Reactor power at 15% to 20%.

C. respond to the automatic Reactor trip and manually trip the Main Feedwater Pumps.

D. check that no Feedwater Pumps are running and manually trip the Reactor.

Answer: D

Answer Explanation:

A is incorrect: A Feedwater Isolation signal results, but so does a Main Feedwater pump trip, so resetting the FWI signal won't suffice.

B is incorrect: The Main Turbine trips, but because power is <P-8 (30%), no automatic reactor trip results. Because of the loss of feedwater also, the crew cannot stabilize power per 1BOA TG-8 (which this implies).

C is incorrect: The Main Turbine trips, but because power is <P-8 (30%), no automatic reactor trip results.

D is CORRECT: The P-14 signal will cause a Feedwater Isolation, trip the Main Turbine and trip the Main Feedwater pumps. BAR 1-18-A1 directs a reactor trip, since no feedwater pumps are running.

Question 44 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28649
User-Defined ID:	
Cross Reference Number:	
Topic:	Actions on P-14 SG level
Num Field 1:	2.7
Num Field 2:	3.1
Text Field:	059A2.03
Comments:	Source: New Cognitive Level: High Reference: BAR 1-18-A1 K/A 059A2.03 Main Feedwater System: Ability to (a) predict the impacts of the following malfunctions or operations on the MFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Overfeeding event. Question meets K/A - Candidate must predict the impact of the overfeeding event - a loss of feedwater - and use procedures - respond by tripping the reactor. This action is directed by the BAR. 10CFR55.41(b)(5)

Associated objective(s):

Given a set of plant conditions or parameters indicating an Excessive FW Flow condition, DISCUSS the operator actions required to be promptly performed to stabilize the plant or mitigate the consequences of the event or casualty

45	Points: 1.00

A loss of DC Bus ______ will prevent the 1A Auxiliary Feedwater pump from automatically starting on a Safety Injection signal.

A. 111

B. 112

C. 113

D. 114

Answer: A

Answer Explanation:

A is CORRECT: Cannot start from MCR or RSDP, or automatically without DC 111.

B is incorrect: DC 112 does not interface with the 1A AFP.

C is incorrect: DC 113 does not interface with the 1A AFP.

D is incorrect: DC 114 does not interface with the 1A AFP.

Question 45 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	16008
User-Defined ID:	
Cross Reference Number:	
Topic:	1A AFP start on control power loss
Num Field 1:	3.7
Num Field 2:	3.7
Text Field:	061K2.02
Comments:	Source: New Cognitive Level: Memory Reference: 6E-1-4030AF01 K/A 061K2.02 Auxiliary Feedwater System - Knowledge of bus power supplies to the following: AFW electric driven pump Question meets K/A - Candidate must know the DC bus power supply that provides power to the automatic start logic of the AFW electric driven pump. 10CFR55.41(b)(7)

Associated objective(s):

Given a set of plant conditions or parameters indicating a Loss of a DC Bus and a set of plant procedures, IDENTIFY the correct procedure(s) to be utilized and DISCUSS required operator actions

46	Points: 1.00

Unit 1 has experienced a fault on Bus 6 in the Switchyard, causing a Loss of Offsite Power condition.
The following conditions are noted on the 1A Diesel Generator:

- Generator Output: 5750 KW
- Generator Current: 915 amps

Which ONE of the following indicates the MAXIMUM length of time the 1A Diesel generator can operate under the given circumstances?

A. Shutdown immediately

B. 2 hours

C. 2000 hours

D. No time limit

Answer: C

Answer Explanation:

A is incorrect: An immediate shutdown would be required if loading exceeded 6050 KW.

B is incorrect: The 2 hour limit is if loading is between 5935 KW and 6050 KW.

C is CORRECT: The 2000 hour limit is if loading is between 5500 KW and 5935 KW. The stem has load at 5750 KW.

D is incorrect: No limit if loading is below 5500 KW.

Question 46 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	7381
User-Defined ID:	
Cross Reference Number:	
Topic:	DG loading time limits
Num Field 1:	4.1
Num Field 2:	4.4
Text Field:	062K3.02
Comments:	Source: Bank Cognitive Level: Memory Reference: BOP DG-11 K/A 062K3.02 AC Distribution - Knowledge of the effect that a loss or malfunction of the AC Distribution System will have on the following: ED/G. Question meets K/A - Candidate must know the load limits for the ED/G on a loss of offsite power to the AC busses. 10CFR55.41(b)(8)

Associated objective(s):

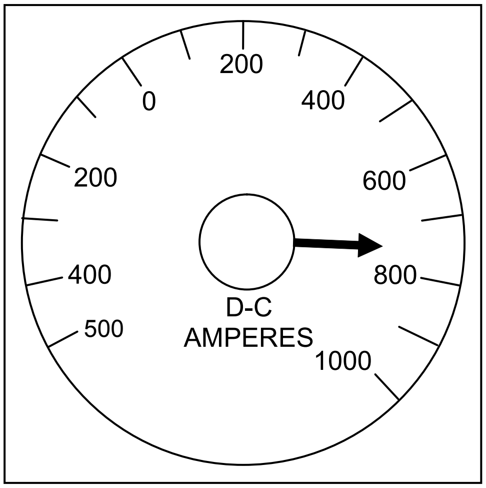
DESCRIBE the actions necessary to stabilize the plant following the Loss of Offsite Power

Given a step, note or caution from 1/2BOA ELEC-4 , Loss of Offsite Power, EXPLAIN the basis of that note, caution or step

DISCUSS the operation of the generator and exciter including: Rating and Time Limits

Unit 1 has experienced a Loss of All AC power.

At 1300, DC Bus 112 125V Batteries have a suspected ground with a discharge rate as shown on the meter:



The approximate time of discharge for the batteries is __(1)__ .

If a 400 amp ground is isolated, the batteries will last until approximately __(2)__ .

Consider each situation SEPARATELY.

	__(1)__	__(2)__
A.	1500	1900
B.	1500	2300
C.	1600	1900
D.	1600	2300

Answer: A

Answer Explanation:

A is CORRECT: The meter reads about 760 amps, and the table on DC-2T1 gives a 2 hour battery life for 768 amps. When 400 amps is removed by ground isolation, that leaves about 360 amps of current draw for an expected life of 6 hours.

B is incorrect: 10 hours is the battery life for 248 amps draw.

C is incorrect: 3 hours is the battery life for 600 amps draw, the next lower number reading on the meter.

D is incorrect: 3 hours is the battery life for 600 amps draw, the next lower number reading on the meter. 10 hours is the battery life for 248 amps draw.

Question 47 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	20681
User-Defined ID:	
Cross Reference Number:	
Topic:	DC 125V battery capacity
Num Field 1:	2.5
Num Field 2:	3.3
Text Field:	063A1.01
Comments:	**Provide BOP DC-2T1 to candidates** Source: New Cognitive Level: High Reference: BOP DC-2T1 K/A 063A1.01 DC Electrical Distribution - Ability to predict and/or monitor changes in parameters associated with operating the DC electrical system controls including: battery capacity as it is affected by discharge rate. Question meets K/A - Candidate must read a meter to determine the rate of discharge, and then predict a change in the discharge rate based on operating the DC distribution system. 10CFR55.41(b)(8)

Associated objective(s):

ANALYZE a set of plant conditions involving the DC Electrical Distribution System and DETERMINE proper system response upon receipt of a ground

48 **Points: 1.00**

Bus 142 lost offsite power and 1B Diesel Generator failed to automatically start.

- 1B Diesel Generator is being started locally per 1BOA ELEC-3, "Loss of 4KV ESF Bus" Attachment D, "Local Start of 1B D/G", to re-energize Bus 142.
- Isolation switches 43IS-1, 43IS-2, 43IS-3, and 43IS-4 on the 1B D/G Control Panel are placed in the ISOL position.

Placing the 1B D/G 43IS switches in the ISOL position:

A. BYPASSES the Bus 142 Load Sequencing timers allowing manual loading of the 1B D/G.

B. ISOLATES the 1B D/G controls AND indications from the Main Control Room.

C. BLOCKS BOTH the 1B D/G Test Mode and Emergency Mode Trips.

D. BLOCKS the 1B D/G Test Mode Trips ONLY.

Answer: B

Answer Explanation:

A is incorrect: The isolation switches do NOT bypass the sequencer.

B is CORRECT: The isolation switches are used to isolate potentially shorted or grounded control systems, leaving only the local controls and indications for running the EDG. When the switches are isolated, the DC Control Power for the EDG is verified to be available by checking the lights LIT. This is part of the troubleshooting process to restore electrical power.

C is incorrect: Test mode trips are bypassed when in emergency mode, not by the isolation switches.

D is incorrect: Emergency trips are never bypassed.

Question 48 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	11492
User-Defined ID:	
Cross Reference Number:	
Topic:	DC control power EDG Isolation Switches
Num Field 1:	2.6
Num Field 2:	3.8
Text Field:	063G2.2.20
Comments:	Source: Bank Cognitive Level: Memory Reference: 1BOA ELEC-3 K/A 063G2.2.20 DC Electrical Distribution - Knowledge of the process for managing troubleshooting activities. Question meets K/A - Candidate must know the process of troubleshooting a loss of DC power for the emergency diesel generators by manipulating the control circuits. 10CFR55.41(b)(10)

Associated objective(s):

Given a step, note or caution from 1/2BOA ELEC-3, Loss of 4KV ESF Bus, EXPLAIN the basis of that note, caution or step

49 **Points: 1.00**

Unit 2 had a Loss of Offsite Power.

- The 2A DG had a catastrophic failure resulting in an ongoing fire in the 2A DG room.
- The 2A DG room is uninhabitable due to fire and CO_2 hazards.
- 2BOA ELEC-6, "2A DG Failure With Possible Missle Generation" has been implemented.

Regarding the operation of the 2B DG, carrying Bus 242 ESF loads, the operators are required to...

A. transfer the contents of the 2B DG Diesel Oil Storage Tank to the Outside Diesel Oil Storage Tank.

B. initiate FP to the 2B DG Day Tank room to prevent the fire from migrating to the Day Tank.

C. initiate FP to the 2A diesel oil storage tank room to prevent the fire from migrating to the storage tank.

D. locally control 2B DG Fuel Oil Transfer pumps in "HAND" at 2PL08J to maintain 2B Day Tank level between 80% and 110%.

Answer: D

Answer Explanation:

A is incorrect: While the 2B diesel oil system is threatened by this failure, there is no procedural direction to transfer the storage tanks in the Aux Building to the Outside DO Storage Tank.

B is incorrect: 2B DG Day Tank fire is prevented by cycling the pumps to prevent spillage through the overflow line to the 2A DG room.

C is incorrect: There is no need to initiate FP to the storage tank room; the areas are physically separated.

D is CORRECT: The 2nd caution in 2BOA Elec-6 directs the operators to treat the 2B overflow line as damaged if it cannot be verified as intact. Under the conditions given, no one can verify the line intact. 2BOA Elec-6 is an unique procedure for the only one of the 4 EDGs that have this vulnerability. The caution is very explicit for this particular situation.

Question 49 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	19288
User-Defined ID:	
Cross Reference Number:	
Topic:	Loss of FO transfer system on Unit 2
Num Field 1:	3.2
Num Field 2:	3.3
Text Field:	064K6.08
Comments:	Source: Bank Cognitive Level: High Reference: 2BOA ELEC-6 K/A 064K6.08 Emergency Diesel Generators - Knowledge of the effect of a loss or malfunction of the following will have on the ED/G system: Fuel oil storage tanks. Question meets K/A - Candidate must know that the overflow line from the 2B fuel oil storage tank which is located in the 2A DG room can be damaged, and must know the effect on the DG and the way to compensate by hand controlling the fuel oil transfer pumps from the downstairs storage tank to the day tank. 10CFR55.41(b)(7)

Associated objective(s):

Given a set of plant conditions or parameters indicating the loss of a 4KV ESF bus or a Diesel Generator Malfunction and a set of plant procedures, IDENTIFY the correct procedure(s) to be utilized and DISCUSS required operator actions

50	Points: 1.00

A normal release of the 0C Gas Decay Tank is in progress.

0GW014, Waste Gas Discharge Control Valve will automatically CLOSE, if...

A. the GW Vent Header reaches the HIGH pressure setpoint.

B. ALL Aux Building Exhaust Fans are tripped.

C. a "HIGH Alarm" occurs on 0PR13J, Gas Decay Tank Cubicle Rad Monitor.

D. a "HIGH Alarm" occurs on 0PR02J, Gas Decay Tank Effluent Rad Monitor.

Answer: D

Answer Explanation:

A is incorrect: High pressure in the vent header does not close 0GW014.

B is incorrect: Loss of vent fans does not close 0GW014.

C is incorrect: A high alarm on this monitor has no automatic actions.

D is CORRECT: The automatic response of a high alarm on this monitor is to close 0GW014.

Question 50 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	18001
User-Defined ID:	
Cross Reference Number:	
Topic:	High rad termination of GDT release
Num Field 1:	4.0
Num Field 2:	4.3
Text Field:	073K4.01
Comments:	Source: Bank Cognitive Level: Memory Reference: BARs RM11-3-0PR02J and 0PR13J K/A 073K4.01 Process Radiation Monitoring - Knowledge of PRM system design features(s) and/or interlock(s) which provide for the following: Release termination when radiation exceeds setpoint. Question meets K/A - Candidate must know the high radiation alert on the GDT effluent radiation monitor will close the waste gas discharge valve. 10CFR55.41(b)(11)

Associated objective(s):

STATE the interlocks associated with the AR/PR system and purpose of each including:
PR: Gas Decay Tank Effluent

51 **Points: 1.00**

A liquid release is in progress from Release Tank 0WX01T.

- An RM-11 alarm is received and acknowledged to be 0PR01J, Liquid Radwaste Effluent Rad Monitor, with a DARK BLUE Color.

What is the impact of this alarm and appropriate action(s), if any?

A. EQUIPMENT FAILURE is indicated; VERIFY with RW operator that release flow rate has NOT changed.

B. DETECTOR FAILURE is indicated; VERIFY with RW operator that release flow rate has NOT risen.

C. OPERATE FAILURE is indicated; VERIFY with RW operator that the release has TERMINATED.

D. OPERATE FAILURE is indicated; VERIFY with RW operator that release flow rate has NOT changed.

Answer: C

Answer Explanation:

A is incorrect: Dark Blue indicates an Operate Failure.

B is incorrect: Dark Blue indicates an Operate Failure.

C is CORRECT: The DARK BLUE Color on the RM-11 means an Operate Failure has occurred, which could be several things from detector failure to loss of sample flow, but the exact cause will not be readily apparent at the RM-11. Since this is the case, the output will be generated to any auto actuation components as if the monitor is in a HIGH alarm condition. For 0PR01J, this will close the liquid release isolation valve, stopping the release.

D is incorrect: Even with proper blowdown in service and monitored, the release will be terminated on an Operate Failure.

Question 51 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28653
User-Defined ID:	
Cross Reference Number:	
Topic:	0PR01J Operate failure interlock
Num Field 1:	2.5
Num Field 2:	2.9
Text Field:	073A2.01
Comments:	Source: Bank Cognitive Level: Memory Reference: BAR RM11-1-0PR01J K/A 073A2.01 Process Radiation Monitoring (PRM) System - Ability to (a) predict the impacts of the following malfunctions or operations on the PRM system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Erratic or failed power supply Question meets K/A - Candidate must know the meaning of the indication of an Operate Failure, and the impact of the interlock to verify proper control of the malfunction. 10CFR55.41(b)(13)

Associated objective(s):

STATE the interlocks associated with the AR/PR system and purpose of each including:
PR: Liquid Radwaste Effluent

52	Points: 1.00

Both units are at 100% power.

- The suction line to the 2B SX pump sheared completely off at the pump.

Which trains of SX are affected by the subsequent room flooding?

A. Unit 2 B Train ONLY

B. Unit 2 A Train and Unit 2 B Train

C. Unit 1 B Train and Unit 2 B Train

D. Unit 1 A and B Train and Unit 2 A and B Train

Answer: C

Answer Explanation:

A is incorrect: 1B SX pump is in the same room as the 2B SX pump so it will also be affected.

B is incorrect: 2A SX pump is in a separate flood sealed room, so will not be affected by flooding in the B train room. Candidate may think both pumps of a single unit are in the same room.

C is CORRECT: 1B and 2B SX pumps are in a common, flood sealed room. Flooding in the room will affect both units' B trains.

D is incorrect: Units' trains are in separate flood sealed rooms in the 330' level of the Aux Building. Candidate may think flooding in one room will also affect the other room.

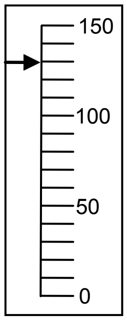
Question 52 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28654
User-Defined ID:	
Cross Reference Number:	
Topic:	SX room flooding
Num Field 1:	2.8
Num Field 2:	3.2
Text Field:	076K4.06
Comments:	Source: New Cognitive Level: Memory Reference: 0BOA PRI-8 K/A 076K4.06 Service Water System - Knowledge of SWS design feature(s) and/or interlock(s) which provide for the following: Service water train separation. Question meets K/A - Candidate must know the Essential Service Water (SX) pumps are train separated in flood seal protected rooms, but share the room with the same train pump for the other unit. This is a design feature to ensure train separation in case of catastrophic flooding because the pumps are below grade and the SX tower basins would flood the room in the event of a sheared pipe. PRA for SX (46%) and Internal Flooding (14%) shows they are extremely high risk initiating events for CDF analysis, so the candidates should know the methods and design that mitigates that risk. 10CFR55.41(b)(7)

Associated objective(s):

PREDICT the effect on plant systems of an SX component or system failure

Both units are at 100% power.

- The Instrument Air Header pressure gauge on 0PM01J indicates as shown:



What is the status of the Instrument Air system?

Instrument Air system pressure is...

A. within its normal range.

B. above its normal range and the IA receiver relief valves should be open.

C. below its normal range and the IA dryers should have automatically bypassed.

D. below its normal range and all available Service Air Compressors should have automatically started.

Answer: B

Answer Explanation:

A is incorrect: The normal range for instrument air is 110 - 115 PSIG.

B is CORRECT: The gauge indicates 129 PSIG, considerably above its normal range, and above the IA receiver relief valve setpoint of 125 PSIG.

C is incorrect: The IA dryers bypass at 90 PSIG, which is considerably below the indicated pressure.

D is incorrect: The SAC auto start at various SA pressures, all well below the indicated IA pressure. The highest pressure is the Lead SAC which shuts off at 118 PSIG, so at the given pressure, any SAC running is a malfunction (which would be the cause of the high IA pressure). NO SAC "should" have automatically started.

Question 53 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	3194
User-Defined ID:	
Cross Reference Number:	
Topic:	IA monitoring
Num Field 1:	3.1
Num Field 2:	3.2
Text Field:	078A3.01
Comments:	Source: New 3/10/2014 RFP Cognitive Level: Memory Reference: Byron ILT System LP for IA: I1-SA-XL-01 K/A 078A3.01 Instrument Air System - Ability to monitor automatic operation of the IAS, including: Air pressure Question meets K/A - Candidate must have the ability to monitor the pressure gauge in the control room as shown, and know the automatic effects of the high pressure on the IA system; specifically, the automatic operation of relief valves.

Associated objective(s):

STATE the normal Service Air and Instrument Air operating pressures

54	Points: 1.00

To manually open the 1A RH Pump suction from the Containment Recirculation Sump isolation valve (1SI8811A) from the Main Control Room, the...

A. Charging Pump suction from RH crossover valve (1CV8804A) must be closed.

B. 1A RH Pump RWST suction valve (1SI8812A) must be closed.

C. CS Pump suction from the Containment Sump isolation valve (1CS009A) must be closed.

D. Safety Injection Pump mini flow valve(s) 1SI8813, or BOTH 1SI8814 and 1SI8920, must be closed.

Answer: B

Answer Explanation:

A is incorrect: 1SI8811A must be OPEN to OPEN 1CV8804A, but there is no interlock otherwise between them.

B is CORRECT: 1SI8812A must be closed to prevent draining RWST to CNMT sump.

C is incorrect: 1SI8811A must be OPEN to OPEN 1CS009A, but there is no interlock otherwise between them

D is incorrect: SI Pump miniflow recircs must be closed to open 1SI/CV8804A/B, and vice-versa, but no interlock with 1SI8812A.

Question 54 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	10283
User-Defined ID:	
Cross Reference Number:	
Topic:	Operating 1SI8811A from the MCB interlocks
Num Field 1:	4.0
Num Field 2:	3.8
Text Field:	006A4.02
Comments:	Source: Bank Cognitive Level: High Reference: 1BEP ES-1.3, Attachment A K/A 006A4.02 Emergency Core Cooling System - Ability to manually operate and/or monitor in the control room: Valves. Question meets K/A – Candidate must know the required interlocks to operate the ECCS valve supplying the RH pumps for SI recirculation flow. 10CFR55.41(b)(7)

Associated objective(s):

DESCRIBE the valve interlocks, including purpose, for the following: _SI8811 A and B

ANALYZE a given set of plant conditions and DETERMINE RH System Tech Spec/TRM operability requirements

55	Points: 1.00

Unit 1 is at 100% power.

- Which event is an entry condition into 1BOA PRI-11, Loss of Containment Integrity?

A. One emergency air lock door open.

B. Report of overall containment integrated leakage failing acceptance criteria.

C. Closure of 1CC053, Penetration Cooling Supply Header Isolation Valve.

D. The failure of a containment isolation valve to meet its stroke test time.

Answer: B

Answer Explanation:

A is incorrect: BOTH doors open (and presumably unable to shut) of either entrance is a failure of CNMT integrity and entry conditions for the listed BOA. 1 door open of either entrance still keeps CNMT intact.

B is CORRECT: Failure of the integrated leak rate test means that CNMT integrity is breached, and an entry condition to the BOA.

C is incorrect: 1CC053 trips shut on high flow, as often happens when a second CC pump is started. This is not indicative by itself of a loss of CNMT integrity and is not an entry condition to the BOA.

D is incorrect: This is a TS failure of 1 CNMT penetration valve. This is not a loss of integrity, although it would lead to a TS LCOAR for 3.6.3 (not 3.6.1, which is the Containment Tech Spec.)

Question 55 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	7380
User-Defined ID:	
Cross Reference Number:	
Topic:	Entry conditions Pri-11
Num Field 1:	3.8
Num Field 2:	4.2
Text Field:	103K3.02
Comments:	Source: New 2/26/2014 RFP Cognitive Level: Memory Reference: 1BOA Pri-11 K/A 103K3.02 Containment System - Knowledge of the effect that a loss or malfunction of the containment system will have on the following: Loss of containment integrity under normal conditions. Question meets K/A - Candidate must know what malfunctions will indicate a loss of containment integrity with the plant in normal at-power conditions. Question is put in terms of entry conditions for the BOA, which IS the indication of a loss of containment integrity, and provides an objective measurement of knowledge. 10CFR55.41(b)(9)

Associated objective(s):

ANALYZE a given set of plant conditions and DETERMINE if entry into 1/2BOA PRI-11, Loss of Containment Integrity, is required

56	Points: 1.00

Unit 1 is at 100% power.

- A power reduction is begun with Rod Mode Switch in AUTOMATIC.
- The Movable Gripper Coil of Rod H-8 in Control Rod D has failed open and cannot be energized.

When Control Bank D is stepped in, what is the effect on the plant due to this blown fuse?

A. Control Bank D rods are stopped from moving by a Rod Control Urgent Failure alarm.

B. Rod H-8 immediately falls fully into the core when the Movable Gripper Coil de-energizes.

C. Rod H-8 stays in its current position as the rest of Control Bank D is inserted by the Reactor Control Unit demand.

D. As Rod H-8 Stationary Gripper Coil deenergizes and then reenergizes, Rod H-8 ratchets several steps into the core every time CB D is moved a step, until it is fully inserted.

Answer: D

Answer Explanation:

A is incorrect: An urgent failure alarm will not be generated in this case; there are no inputs to it. A regulation failure alarm is caused by a mismatch between demand current and lift coil current. The lift coils are working properly, so there is no regulation failure-Urgent Failure.

B is incorrect: Rod H-8 would fall fully into the core if the Stationary Gripper Coil deenergized.

C is incorrect: Rod H-8 would stay in its current position if the Lift Coil deenergized.

D is CORRECT: NORMALLY: the movable gripper holds the rod drive shaft when the stationary gripper deenergizes. The lift coil (which was energized before the movable gripper, in this case) will deenergize, lowering the rod. The stationary gripper will reenergize, grasping the rod, and movable gripper will deenergize.
With a deenergized movable gripper, when the stationary gripper deenergizes, there is nothing to hold the rod, so it will fall into the core. The stationary gripper reenergizes 1/3 second later, grasping the rod and stopping its inward travel. This is repeated until the rod is on the bottom of the core.

Question 56 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28655
User-Defined ID:	
Cross Reference Number:	
Topic:	CRDM movable gripper failure
Num Field 1:	3.4
Num Field 2:	3.6
Text Field:	001K1.03
Comments:	Source: New 2/26/2014 RFP Cognitive Level: High Reference: Byron ILT System Lesson Plan for Rod Drive: I1-RD-XL-01 K/A 001K1.03 Control Rod Drive System - Knowledge of the physical connections and/or cause-effect relationships between the CRDS and the following: CRDM Question meets K/A - Candidate must know how the Control Rod Drive Mechanism works to move the control rod for normal operations and deduce how it will operate given a failure. 10CFR55.41(b)(2)

Associated objective(s):

DESCRIBE the sequence of events required to insert and withdraw a rod one step

57 **Points: 1.00**

Unit 1 is at 75% power.

- The Controlling Pressurizer Level Channel 1LT-459 fails HIGH.

Over the next 10 minutes, with NO operator action, charging flow will go to approximately...

A. 52 GPM, and Pzr Backup heaters will stay OFF.

B. 52 GPM, and Pzr Backup heaters will turn ON.

C. 150 GPM, and Pzr Backup heaters will stay OFF.

D. 150 GPM, and Pzr Backup heaters will turn ON.

Answer: B

Answer Explanation:

A is incorrect: Candidate may think that as level lowers, heaters will be blocked by the low level interlock. Level would reach 17% in about 50 minutes with no operator action.

B is CORRECT: Indicated controlling level goes high, with program level at 40%. Charging flow goes to Auto Minimum of 52 GPM, so actual Pzr level lowers. The 5% level high mismatch turns on the Pzr Backup heaters.

C is incorrect: This is the response for a LT failing LOW. Charging will maximize, level will rise raising pressure, so heaters stay off.

D is incorrect: Candidate may realize a channel failure will cause BU heaters to turn on, but think it causes charging to rise also.

Question 57 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28656
User-Defined ID:	
Cross Reference Number:	
Topic:	Pzr LT failure effect on pressure control
Num Field 1:	3.2
Num Field 2:	3.7
Text Field:	011K3.03
Comments:	Source: New 2/27/2014 RFP Cognitive Level: High Reference: Byron ILT System Lesson Plan - Pressurizer - I1-RY-XL-01 Chapter 14 K/A 011K3.03 Pressurizer Level Control System - Knowledge of the effect that a loss or malfunction of the Pzr LCS will have on the following: Pzr PCS (Pressure Control System) Question meets K/A - Candidate must evaluate the failure, compare their idea of plant response to the listed choices and determine how the Pzr pressure response and system will respond to a level failure. A time limit is added to provide a parameter to limit the suggested responses; this also requires the candidate to evaluate not only the qualitative response, but to quantify the response. 10CFR55.41(b)(7)

Associated objective(s):

Given a set of plant conditions or parameters indicating a malfunction in the Pressurizer Level Control System, DISCUSS the integrated plant response to the event/casualty with no operator action

Unit 1 is in MODE 2, preparing for a reactor startup.

- Control Bank rods are being withdrawn in MANUAL.

For the Control Bank rods, which of the following describes the status of the DRPI rod bottom lights and control rods at the moment the ROD AT BOTTOM annunciator alarm clears?

A. Bank A rod bottom lights OFF, banks B, C, & D rod bottom lights ON and > 9 steps on bank A.

B. Banks A & B rod bottom lights OFF, banks C & D rod bottom lights ON and > 9 steps on bank C and D rods.

C. Banks A, B, C and D rod bottom lights OFF and all Control Rods < 3 steps.

D. Banks A, B, C and D rod bottom lights ON and any Bank D Control Rod > 3 steps.

Answer: A

Answer Explanation:

A is CORRECT: Control Bank A withdraws first in MANUAL, so its Rod At Bottom light goes off first, when 9 steps withdrawn.

B is incorrect: Control Bank B rod bottom light will go off when its bank is withdrawn 3 steps.

C is incorrect: 3 steps is the setpoint for shutdown bank rod bottom lights.

D is incorrect: 3 steps is the setpoint for shutdown bank rod bottom lights.

Question 58 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	18404
User-Defined ID:	
Cross Reference Number:	
Topic:	Rod at bottom indication on rod withdrawal
Num Field 1:	3.3
Num Field 2:	3.1
Text Field:	014A4.01
Comments:	Source: Bank Cognitive Level: Memory Reference: Annunciator 1-10-E6 K/A 014A4.01 Rod Position Indication System - Ability to manually operate and/or monitor in the control room: Rod selection control. Question meets K/A - Candidate is manually selecting and operating the Control Bank Rods, and monitoring the response of the Rod At Bottom portion of the Rod Position Indication System. 10CFR55.41(b)(7)

Associated objective(s):

DESCRIBE the operation of the Rod Position Indication System

59	Points: 1.00

A loss of AC Instrument Bus ____ will cause the Scaler Timer and Audio Count Rate Drawer on 1PM07J to be inoperable.

A. 111

B. 112

C. 113

D. 114

Answer: D

Answer Explanation:

A is incorrect: 111 powers N31, 35 and 41

B is incorrect: 112 powers N32, 36 and 42

C is incorrect: 113 powers N43 and the Comparator and Rate Drawer

D is CORRECT: 114 powers N44 and the Detector Current Defeat Drawer

Question 59 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28657
User-Defined ID:	
Cross Reference Number:	
Topic:	AC Inst power supply to NI cabinet control drawer
Num Field 1:	3.3
Num Field 2:	3.7
Text Field:	015K2.01
Comments:	Source: New 2/27/2014 RFP Cognitive Level: Memory Reference: 1BOA INST-1 K/A 015K2.01 Nuclear Instrument System - Knowledge of bus power supplies to the following: NIS channels, components and interconnections. Question meets K/A - Candidate must know the power supply to the Comparator Defeat drawer section of the NIS that is used to defeat a failed channel. 10CFR55.41(b)(7)

Associated objective(s):

ANALYZE a given set of plant conditions and DETERMINE: The Expected Plant Response for Repositioning Switches, Defeating Channels, or Tripping Bistables

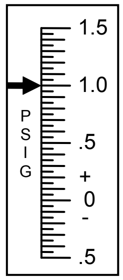
60 **Points: 1.00**

Unit 2 is at 100% power.

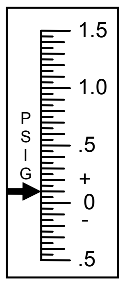
- Unit 2 has the CNMT Mini-purge system in operation.

2VQ05C, CNMT Mini-flow Purge Exhaust fan, must be stopped before CNMT pressure is less than which one of the indications shown on the CNMT ΔP gauge, per Tech Spec requirements?

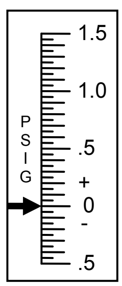
A.



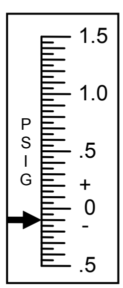
B.



C.



D.



Answer: D

Answer Explanation:

A is incorrect: This indicates +1.0 PSIG, the upper limit.

B is incorrect: This indicates +0.1 PSIG, which may be confused with the real limit.

C is incorrect: This indicates 0 PSIG, which my be thought of as the lower limit.

D is CORRECT: This indicates -0.1 PSIG, the TS lower limit.

Question 60 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28659
User-Defined ID:	
Cross Reference Number:	
Topic:	CNMT Purge TS pressure limit
Num Field 1:	3.0
Num Field 2:	3.3
Text Field:	029A1.03
Comments:	Source: New 2/27/14 RFP Cognitive Level: High Reference: BOP VQ-6 and TS 3.6.4 K/A 029A1.03 Containment Purge System - Ability to predict and/or monitor changes in parameters to prevent exceeding design limits associated with operating the Containment Purge System controls including: Containment pressure, temperature, and humidity. Question meets K/A - Candidate know the Tech Spec Limits for Containment, and apply the pressure limit while reading the gauge shown. 10CFR55.41(b)(9)

Associated objective(s):

DESCRIBE the systems and flow paths that can be used to control containment pressure

61 **Points: 1.00**

The operators have just started aligning the Unit 2 Remote Shutdown Panel following a control room evacuation and trip from 100% power.

- Pressurizer level is determined to be 91% and trending up.
- Letdown is isolated.

Which of the following actions is required?

A. Maintain CC flow to thermal barriers and stop all CV pumps, and monitor the RCP's on the process computer.

B. Verify/place 2FHC-121 in AUTOMATIC to stop the upward Pressurizer level trend.

C. Continue aligning the RSDP controls and bypass 2CV121.

D. Reduce charging through the RCP seals to 3 gpm per pump.

Answer: A

Answer Explanation:

A is CORRECT: This is the action on 1BOA PRI-5 Operator Action Summary page if Pzr level is >90%.

B is incorrect: Even with 2FHC-121 in automatic, minimum charging with no letdown will fill the Pzr.

C is incorrect: Bypassing 2CV121 will still allow charging flow to fill the Pzr.

D is incorrect: Seal injection flow will eventually fill the Pzr.

Question 61 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	19282
User-Defined ID:	
Cross Reference Number:	
Topic:	Control of Pzr level rise from RSDP
Num Field 1:	4.2
Num Field 2:	4.1
Text Field:	002G2.4.34
Comments:	Source: Bank Cognitive Level: Memory Reference: 2BOA PRI-5 OAS K/A 002G2.4.34 Reactor Coolant - Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects. Question meets K/A - Candidate must know the required actions contained on the Operator Action Summary to protect the Reactor Coolant System while taking actions outside the Control Room. 10CFR55.41(b)(10)

Associated objective(s):

Given a set of plant conditions or parameters indicating a Control Room Inaccessibility condition and a set of plant procedures, IDENTIFY the correct procedure(s) to be utilized and DESCRIBE required operator actions

62	Points: 1.00

Unit 2 is at 100% power.

- The selected steam pressure channel for 2B Steam Generator fails LOW.

Feed flow to 2B SG will lower, feed flow to the other Unit 2 SGs will lower __(1)__ than feed flow to the 2B SG, and the operator must select the alternate ___(2)___.

	_(1)_	____(2)____
A.	less	steam flow channel
B.	less	feed flow channel
C.	more	steam flow channel
D.	more	feed flow channel

Answer: A

Answer Explanation:

A is CORRECT: Steam pressure density compensates steam flow, so lowering steam pressure will make indicated steam flow lower. Lowering steam flow will cause the feed pump speed control program to lower DP, lowering feed flow to the other SG also, but less than to the 2B SG. The alternate steam flow channel is selected for control.

B is incorrect: Feed flow channel is not failed, but the lowering feed flows may lead the candidate to choose swapping feed channels.

C is incorrect: Lowering DP will cause the other SG feed flow to lower less than 2B.

D is incorrect: Lowering DP will cause the other SG feed flow to lower less than 2B. Feed flow channel is not failed, but the lowering feed flows may lead the candidate to choose swapping feed channels.

Question 62 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	5090
User-Defined ID:	
Cross Reference Number:	
Topic:	Steam pressure channel failure
Num Field 1:	3.2
Num Field 2:	3.4
Text Field:	035A2.05
Comments:	Source: New Cognitive Level: High Reference: 2BOA Inst-2 K/A 035A2.05 Steam Generator System - Ability to (a) predict the impacts of the following malfunctions or operations on the SG; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Unbalanced flows to the SGs. Question meets K/A - Candidate must know that flow will be unbalanced, and qualify the difference between the most impacted SG and the others, and must know the step from the procedure that will correct the problem. 10CFR55.41(b)()

Associated objective(s):

ANALYZE a given set of plant conditions and DETERMINE which instrument has failed: Steam Pressure Channel

ANALYZE a given set of plant conditions and DETERMINE the required actions per 1/2BOA INST-2, Operation with Failed Instrument Channel

DESCRIBE the actions necessary to stabilize the plant following a Process Instrumentation malfunction

DESCRIBE the expected plant response for the failures listed in TKO T.OA11-03 thru T.OA11-20 including: Alarm Status Changed, Automatic Actions That Happen and Controls and Permissives That are Affected

63 **Points: 1.00**

Unit 1 is at 100% power.

Which ONE of the following combination of failures will cause the steam dumps to open?

	1PT-505 failed	1PT-506 failed
A.	low	low
B.	low	high
C.	high	low
D.	high	high

Answer: A

Answer Explanation:

A is CORRECT: 1PT-505 low lowers rod control Tref below Tave, which provides a temperature mismatch signal to the Load Reject controller. 1PT-506 going low will arm the steam dumps on a load rejection signal.

B is incorrect: 1PT-506 high will not arm the steam dumps.

C is incorrect: 1PT-505 high will bring Tref at or above Tave, so the steam dumps will not have a temperature mismatch signal to open.

D is incorrect: 1PT-505 high will bring Tref at or above Tave, so the steam dumps will not have a temperature mismatch signal to open. 1PT-506 high will not arm the steam dumps.

Question 63 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	10237
User-Defined ID:	
Cross Reference Number:	
Topic:	Steam pressure transmitter failure effects on steam dumps
Num Field 1:	2.7
Num Field 2:	2.9
Text Field:	041K6.03
Comments:	Source: New Cognitive Level: High Reference: BAR 1-14-E6 K/A 041K6.03 Steam Dump System and Turbine Bypass Control - Knowledge of the effect of a loss or malfunction on the following will have on the SDS: Controller and positioners, including ICS, S/G, CRDM. Question meets K/A - Candidate must know the failure mode of these controllers that will cause the steam dump valves to arm and open. 10CFR55.41(b)(7)

Associated objective(s):

Given an operating mode and/or various plant conditions, PREDICT how the steam dump system and/or supported systems will be impacted by various steam dump instrumentation, control circuit, or electrical power failures, without the use of references.

64 **Points: 1.00**

Unit 1 is at 100% power.

- A 450 GPM steam generator tube rupture occurred on the 1A SG.
- Three minutes later, the 1A Main Steam Line radiation monitor on the RM-11 is in High Alarm.

There can also be elevated radiation levels on...

A. NONE of the other Main Steam Line radiation monitors.

B. the 1B Main Steam Line radiation monitor.

C. the 1C Main Steam Line radiation monitor.

D. the 1D Main Steam Line radiation monitor.

Answer: D

Answer Explanation:

A is incorrect: A 450 GPM SGTR results in "shine" onto the other MSL radiation monitors besides the ruptured one.

B is incorrect: 1B MSL is not adjacent to the A MSL, so it will take longer or a larger rupture to affect it like the adjacent D MSL radiation monitor is affected.

C is incorrect: 1C MSL is not adjacent to the A MSL, so it will take longer or a larger rupture to affect it like the adjacent D MSL radiation monitor is affected.

D is CORRECT: The 1D MSL radiation monitor is in the same area as the 1A monitor, and it will be affected by a 450 GPM SGTR in the 1A SG, indicating elevated radiation levels. This is the size of the design basis tube rupture.

Question 64 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28661
User-Defined ID:	
Cross Reference Number:	
Topic:	SGTR effects on MSL rad monitors
Num Field 1:	2.5
Num Field 2:	3.2
Text Field:	072K5.02
Comments:	Source: Bank Cognitive level: High Reference: 1BEP-3 This effect is seen on the Byron simulator RM-11 when sizable (450 GPM) SGTRs are inserted. Post trip, when N-16 gammas are not present, the effect is not as pronounced if evident at all. The B and C steam line monitors are a great distance away from the A steam line, so are not affected by the contamination present in the A steam line. K/A 072K5.02 Area Radiation Monitoring System Alarms: Knowledge of the operation implications of the following concepts as they apply to the ARM system: Radiation intensity changes with source distance. Question meets K/A - Candidate must know the location of the detectors that will alarm on a SGTR, and that the detector on the affected line will receive higher radiation than the detector on the adjacent steam line. The affected detector may reach an alarm setpoint, depending on RCS activity. This is higher cognitive level, because the candidate must analyze the size of the break and the time period to draw the correct conclusion. If the break were much smaller, there would be little or no change in the response of the adjacent detector, and if the analyzed time period were longer, other detectors would be affected.

Associated objective(s):

DISCUSS the principles of operation of the following AR/PR detectors: G-M Tube

65	Points: 0.50

Which one of the following areas has Carbon Dioxide fire suppression available?

A. Main Control Room

B. Quality Assurance Vault

C. Auxiliary Feedwater Pump Day Tank Room

D. Remote Shutdown Panel

Answer: C

Answer Explanation:

A is incorrect: There are no automatic suppression systems in the MCR. It is staffed all the time, and portable extinguishers are located in the room.

B is incorrect: Halon is supplied to the QA Vault.

C is CORRECT: Aux Feed Pump room and Day Tank rooms are protected by CO2 suppression.

D is incorrect: There are no automatic suppression systems in the RSDP. Portable extinguishers are located inside and outside the room.

Question 65 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	0.50
Time to Complete:	3
Difficulty:	3.00
System ID:	596
User-Defined ID:	
Cross Reference Number:	
Topic:	Area protected by CO2
Num Field 1:	3.0
Num Field 2:	3.3
Text Field:	086K4.06
Comments:	Source: Bank Cognitive Level: Memory Reference: Fire Protection Report Chapter 5.4 K/A 086K4.06 Fire Protection System - Knowledge of design feature(s) and/or interlock(s) which provide for the following: CO2 Question meets K/A - Candidate must know the plant design fire protection suppression system to know the areas protected by CO2. 10CFR55.41(b)(7)

Associated objective(s):

STATE the plant areas protected by the following: Carbon Dioxide (CO_2)

66 **Points: 1.00**

An Equipment Operator was printing out BOP AB-17, Revision 23, to swap the Unit 0 Boric Acid Transfer Pump for Unit 2.

- Before any pages printed, the computer network stopped working.
- IT Department estimates it will take 6 hours to get the network back on-line.
- There is a copy of BOP AB-17, Revision 22 available.

To continue swapping the BAT Pump, the Equipment Operator...

A. MUST wait until BOP AB-17, Revision 23 can be printed.

B. can use BOP AB-17, Revision 22 after the Unit Supervisor evaluates it for any fatal flaws.

C. can use BOP AB-17, Revision 22 as is.

D. can swap the BAT Pump from memory, and verify proper alignment after BOP AB-17, Revision 23 is printed.

Answer: B

Answer Explanation:

A is incorrect: The EO CAN wait until the new revision can be printed, but that is not a MUST.

B is CORRECT: The supervisor can evaluate for fatal flaws and allow a superseded revision to be used.

C is incorrect: Can not use "as is" since it's a superseded copy.

D is incorrect: BOPs are "in hand" use, so from memory followed by verification is not allowable.

Question 66 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28662
User-Defined ID:	
Cross Reference Number:	
Topic:	Verifying procedure revision
Num Field 1:	3.5
Num Field 2:	3.6
Text Field:	G2.1.21
Comments:	Source: New Cognitive Level: Memory Reference: HU-AA-104-101 K/A G2.1.21 Ability to verify the controlled procedure copy. Question meets K/A - Candidate must know the administrative procedure requirements to verify the controlled copy, or if unable to do that, an allowable alternative method to use a superseded procedure. 10CFR55.41(b)(10)

Associated objective(s):

ANALYZE a specific plant procedure and DETERMINE the proper use of that procedure

67	Points: 1.00

1BGP 100-1, Plant Heatup, Precautions, Limitations, and Actions states that at least one Reactor Cavity Vent Fan must be operating whenever RCS temperature exceeds 135°F.

The basis for this requirement is to prevent...

A. overheating CRDM's prior to starting the CRDM vent fans.

B. inadequate circulation of air around reactor vessel to preclude formation of explosive mixtures.

C. exposing excore detectors and cabling to high temperatures for extended periods.

D. hot stagnant air formation on top of the reactor vessel head which could damage the RVLIS sensors.

Answer: C

Answer Explanation:

A is incorrect: There is a precaution that CRDM fans shall be on when CRDMs are energized or RCS temperature >350°F.

B is incorrect: This is not a precaution.

C is CORRECT: This precaution is stated in 1BGP 100-1, step D.5.a.

D is incorrect: Running CRDM vent fans will cool RVLIS.

Question 67 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	5773
User-Defined ID:	
Cross Reference Number:	
Topic:	Basis for running Rx cavity vent fans above 135F
Num Field 1:	3.8
Num Field 2:	4.0
Text Field:	G2.1.32
Comments:	Source: Bank Cognitive Level: Memory Reference: 1BGP 100-1 K/A G2.1.32 Ability to explain and apply system limits and precautions. Question meets K/A - Candidate must know the reason for the system precaution in BGP 100-1 to explain it. 10CFR55.41(b)(10)

Associated objective(s):

STATE the bases for each Prerequisite, Precaution, Limitation, Caution and Note of GP 100-1, Plant Heatup

68	Points: 1.00

The Field Supervisor initiates a procedure change to BOP AB-8 "Transfer of Boric Acid From Unit 2 BAT to Unit 1 BAT" to alter the valve alignment, bypassing BOTH AB filters, which is a plant configuration change.

Per AD-AA-101, Processing of Procedures and T&RMs, the above proposed procedure change __(1)__ involve a change of intent and a(n) __(2)__ procedure change should be initiated.

	__(1)__	__(2)__
A.	does	interim
B.	does NOT	interim
C.	does	editorial
D.	does NOT	editorial

Answer: A

Answer Explanation:

A is CORRECT: Bypassing the filter is a change of intent of the procedure per section 4.2.2 ("The revision changes plant configuration"), and requires an interim change as stated in the answer.

B is incorrect: Bypassing the filter is a change of intent of the procedure.

C is incorrect: A change of intent requires an interim change.

D is incorrect: Bypassing the filter is a change of intent of the procedure, and requires an interim change.

Question 68 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	17898
User-Defined ID:	
Cross Reference Number:	
Topic:	Procedure change
Num Field 1:	3.0
Num Field 2:	3.6
Text Field:	G2.2.06
Comments:	Source: Bank Cognitive Level: High Reference: AD-AA-101 K/A G2.2.06 Knowledge of the process for making changes to procedures Question meets K/A - Candidate must evaluate the change to the plant configuration to determine the change of intent, and be knowledgable about the procedure change process. 10CFR55.41(b)(10)

Associated objective(s):

Given a set of conditions, IDENTIFY the type of procedure process that would implement the correct change dictated by the conditions

69 **Points: 1.00**

Unit 1 is at 100% power.

If 1RY456 (PZR PORV) develops excessive seat leakage, TS 3.4.11, "Pressurizer PORVs" actions will require within 1 hour, that 1RY8000B (1RY456 block valve) be CLOSED with power...

A. MAINTAINED.

B. MAINTAINED and immediately enter LCO 3.6.3, "Containment Isolation Valves".

C. REMOVED.

D. REMOVED and immediately enter LCO 3.6.3, "Containment Isolation Valves".

Answer: A

Answer Explanation:

A is CORRECT: LCOAR A states to maintain power to block valve for PORV inoperable but capable of being manually cycled.

B is incorrect: T 3.6.3 requires similar actions for isolating CNMT isolation valves that have operability issues, but 1RY456 and 1RY8000B are not CNMT isolation valves.

C is incorrect: Power is maintained to the block valves.

D is incorrect: 3.6.3 requires similar actions for isolating CNMT isolation valves that have operability issues, but 1RY456 and 1RY8000B are not CNMT isolation valves.

Question 69 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	13005
User-Defined ID:	
Cross Reference Number:	
Topic:	Pzr PORV seat leakage TS requirements
Num Field 1:	3.9
Num Field 2:	4.5
Text Field:	G2.2.39
Comments:	Source: Bank Cognitive Level: High Reference: TS 3.4.11 K/A G.2.2.39 Knowledge of less than or equal to one hour Technical Specification action statements for systems. Question meets K/A - Candidate must evaluate the situation that a second PORV has become inoperable and apply the TS required action. This is a 1 hour completion time so it is required knowledge for the RO. 10CFR55.41(b)(7)

Associated objective(s):

Given a set of plant conditions, DETERMINE from memory, applicable pressurizer Tech Spec item operability requirements

70 **Points: 1.00**

Unit 1's Annunciator 1-1-C7, "Remote S/D Panel Trouble" is LIT

- SER Point 1846 is printed for "Remote Shutdown Panel IA Press Low/Loss of Power Alarm".
- The annunciator circuit has power available and fuses are intact.

Using 6E-1-4030IA06, determine that with this alarm LIT, Relay 1PSL-IA9X is __(1)__, and device 1EL-IA009 is __(2)__.

	___(1)___	___(2)___
A.	de-energized	de-energized
B.	de-energized	energized
C.	energized	de-energized
D.	energized	energized

Answer: B

Answer Explanation:

A is incorrect: 1EL-009 will be energized.

B is CORRECT: With low pressure, 1PSL-IA009 is open, de-energizing relay 1PSL-IA9X. Contact 1PSL-IA9X is NC, so is closed, energizing 1EL-009.
The annunciator has contact 1PSL-IA9X 3-4, which is NC, and has to be closed to bring in the alarm.

C is incorrect: 1PSL-IA9X will be de-energized and 1EL-009 will be energized.

D is incorrect: 1PSL-IA9X will be de-energized.

Question 70 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28133
User-Defined ID:	
Cross Reference Number:	
Topic:	IA alarm on print
Num Field 1:	3.5
Num Field 2:	3.9
Text Field:	G2.2.41
Comments:	**Provide reference: 6E-1-4030IA06** Source: Bank Cognitive Level: High Reference: 6E-1-4030IA06 K/A G2.2.41 Loss of Instrument Air: Ability to obtain and interpret station electrical and mechanical drawings. Question meets K/A - Candidate must interpret the station electrical drawing for a loss of IA. 10CFR55.41(b)(7)

Associated objective(s):

STATE the purpose and DISCUSS the operation of the following major component: Instrument Air Distribution Headers

71	Points: 1.00

What is the emergency exposure limit to save a human life, in accordance with RP-AA-203, Exposure Control And Authorization?

A. 2 rem

B. 5 rem

C. 10 rem

D. 25 rem

Answer: D

Answer Explanation:

A is incorrect: 2 Rem is plausible as that is the admin limit of Byron personnel.

B is incorrect: 5 Rem is plausible as that is the 10CFR20 Federal Limit.

C is incorrect: 10 Rem is plausible as that is the Emergency Limit to protect property.

D is CORRECT: 25 Rem is the correct answer for Life Saving.

Question 71 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28585
User-Defined ID:	
Cross Reference Number:	
Topic:	Lifesaving TEDE limit
Num Field 1:	3.2
Num Field 2:	3.7
Text Field:	G2.3.4
Comments:	Source: Bank Cognitive Level: Memory Reference: RP-AA-203 pg 7 K/A G2.3.4 Radiation Control - Knowledge of radiation exposure limits under normal or emergency conditions. Question meets K/A - Candidate must know the emergency exposure limit. 10CFR55.41(b)(12)

Associated objective(s):

DESCRIBE the emergency dose limits, including:
A. Desired Approvals
B. Personnel Criteria
C. Applicable Limits

72	Points: 1.00

Both units are at 100% power.

- A RO is hanging a Clearance Order tag on a valve on top of the VCT on 426' in the Auxiliary Building.

Independent verification of the valve position may be waived by the ___(1)___, because of concerns with _________(2)_________.

	________(1)________	_________(2)_________
A.	Shift Manager	working at heights
B.	Site Safety Advisor	working at heights
C.	Shift Manager	minimizing radiation dose
D.	Radiation Protection Manager	minimizing radiation dose

Answer: C

Answer Explanation:

A is incorrect: SM does waive the requirement for IV, but not for the reason given. IV is still required when climbing is required.

B is incorrect: SSA does not waive the requirement for IV, and waiver is not allowed for working at heights.

C is CORRECT: The SM may waive IV for ALARA concerns. This is a radiological safety principle.

D is incorrect: The RPM cannot waive IV of valve position.

Question 72 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	7367
User-Defined ID:	
Cross Reference Number:	
Topic:	Reason to waive IV requirement for ALARA
Num Field 1:	3.2
Num Field 2:	3.7
Text Field:	G2.3.12
Comments:	Source: Bank Cognitive Level: Memory Reference: HU-AA-101 Section 4.3 K/A G2.3.12 Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc. Question meets K/A - Candidate must know the requirement for Independent Verification may be waived for ALARA concerns (in accordance with HU-AA-101, Human Performance Tools and Verification Practice), which is a principle of radiological safety.The SM has the responsibility to waive the IV, but the question can be answered solely based on RO knowledge of IV requirements in the face of radiological safety. 10CFR55.41(b)(12)

Associated objective(s):

DISCUSS the requirements for entering, working in a Radiologically Posted Area

73	Points: 1.00

Per BAP 1310-10, HU-AA-104-101, PROCEDURE USE AND ADHERENCE, BYRON ADDENDUM, which of the following correctly describes when an emergency procedure action on the Operator Action Summary Fold Out Page (OAS), is applicable?

A. Only PRIOR to performing the applicable step in the main body of the procedure.

B. ANY time during the applicable procedure performance, unless a specific procedural starting point is referenced in the action.

C. Only after proceeding PAST the applicable step in the main body of the procedure, AND it MAY apply after a transition is made to another procedure.

D. Only after proceeding PAST the applicable step in the main body of the procedure, BUT it DOES NOT apply after a transition is made to another procedure.

Answer: B

Answer Explanation:

A is incorrect: OAS actions apply as soon as the procedure is entered.

B is CORRECT: OAS actions apply throughout the procedure they are connected to.

C is incorrect: Applicable to continuous action summary steps depending on the action and whether it is superseded or no longer applicable to the next procedure.

D is incorrect: Applicable to continuous action summary steps depending on the action and whether it is superseded or no longer applicable to the next procedure.

Question 73 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28664
User-Defined ID:	
Cross Reference Number:	
Topic:	OAS usage in procedures
Num Field 1:	4.6
Num Field 2:	4.6
Text Field:	G2.1.20
Comments:	Source: Bank Cognitive Level: Memory Reference: BAP 1310-10 K/A G2.1.20 Ability to interpret and execute procedure steps. Question meets K/A - Candidate must have the ability to interpret and execute procedure steps and must know rules of usage for operator action summary actions in order to properly execute them. 10CFR55.41(b)(10)

Associated objective(s):

DESCRIBE how to use the Operating Department procedures

74	Points: 1.00

Unit 1 was at 95% power.

- The Unit 1 Main Condenser developed unisolable air inleakage and vacuum is degrading.
- The crew ramped Unit 1 down to 400 MW in an attempt to stabilize vacuum.
- At 1300, condenser absolute pressure was trended to be rising from 3" HgA at a constant 1" Hg per hour.

The EARLIEST time the crew will be procedurally directed to trip Unit 1, per 1BOA Sec-3, "Loss of Condenser Vacuum" is...

A. 1530

B. 1700

C. 1730

D. 1800

Answer: A

Answer Explanation:

A is CORRECT: 1530 is the time when vacuum will reach 5.5". With the ramp, plant power has been lowered such that 5.5" is the trip setpoint, so this is the correct trip time.

B is incorrect: 1700 is the time for vacuum to reach 7", which is the C-9, CONDENSER NOT AVAILABLE setpoint. Steam Dumps are blocked at this pressure, which the candidate may consider as the appropriate time to trip.

C is incorrect: 1730 is the time for vacuum to reach 7.5", the setpoint for the CONDENSER LOW VACUUM ALARM. The candidate may evaluate this as the time the turbine operation can't be supported and decide this is the time to trip.

D is incorrect: 1800 is the time for vacuum to reach 8". If the power ramp down is not considered, this is the pressure at which the plant would be tripped.

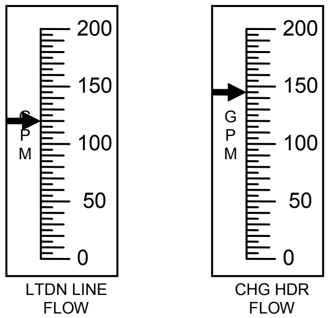
Question 74 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28665
User-Defined ID:	
Cross Reference Number:	
Topic:	Degraded condenser vacuum
Num Field 1:	42
Num Field 2:	4.2
Text Field:	G2.4.47
Comments:	**PROVIDE Figure 1BOA Sec-3-1** Source: New 3/2/2014 RFP Cognitive Level: High Reference: 1BOA Sec-3 K/A G2.4.47 Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material. Question meets K/A - Candidate must be able to use the supplied graph to trend the power descension and condenser pressure rise to determine the time action must be taken, discriminating between the different possible setpoints or trigger points for a plant trip. 10CFR55.41(b)()

Associated objective(s):

Given a set of plant conditions or parameters indicating a Partial Loss of Condenser Vacuum, and a set of plant procedures, IDENTIFY the correct procedure(s) to be utilized and DISCUSS required operator actions

Unit 1 is at 100% power.

- Annunciator 1-7-B2, RCP SEAL WTR INJ FLOW LOW is LIT.
- Letdown and charging flows are as indicated below.



To clear the alarm and restore the conditions to normal, the NSO will throttle...

A. 1CV182, Charging Header Back Pressure Control Valve in the CLOSED direction.

B. 1CV182, Charging Header Back Pressure Control Valve in the OPEN direction.

C. 1CV121, Cent Charging Pump Flow Control Valve in the CLOSED direction.

D. 1CV121, Cent Charging Pump Flow Control Valve in the OPEN direction.

Answer: A

Answer Explanation:

A is CORRECT: 1CV182 is too far open, allowing more charging flow (145 GPM instead of normal 132 GPM) and less seal injection flow (< 6.6 GPM as evidenced by the Low Seal Inj Flow alarm). It is a will be throttled in the closed direction, restricting charging flow, and diverting more flow to the RCP seals.

B is incorrect: This would further lower seal injection flow.

C is incorrect: This would lower both seal injection flow and charging flow.

D is incorrect: This would raise charging flow, but would raise charging flow much too high, causing Pzr level to rise and VCT level to lower.

Question 75 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28666
User-Defined ID:	
Cross Reference Number:	
Topic:	Low seal injection flow
Num Field 1:	4.2
Num Field 2:	4.0
Text Field:	G2.4.50
Comments:	Source: New 3/5/2014 RFP Cognitive Level: High Reference: BAR 1-7-B2 K/A G2.4.50 Ability to verify system alarm setpoints and operate controls identified in the alarm response manual. Question meets K/A - Candidate must evaluate the alarm and the given indication to diagnose the problem, and operate 1CV182 as identified in the alarm response procedure to restore the plant to normal conditions. 10CFR55.41(b)(10)

Associated objective(s):

DESCRIBE the purpose of the Reactor Coolant Pump Seals, and EXPLAIN their operation

76 **Points: 1.00**

Unit 1 experienced an automatic reactor trip from 100% power.

- The SRO is directing the actions of 1BEP ES-0.1, Reactor Trip Response, Step 2, Check Shutdown Reactivity Status.
- Two Rod At Bottom Lights are NOT lit.

The SRO will direct the crew to...

A. perform the immediate actions of 1BFR S.1, Response to Nuclear Power Generation/ATWS.

B. immediately perform a Shutdown Margin calculation and verify the Reactor is subcritical.

C. borate using 1BOA PRI-2, Emergency Boration.

D. borate using BOP CV-27, Operation of the Reactor Makeup System in the Emergency Boration Mode.

Answer: C

Answer Explanation:

A is incorrect: 1BFR S.1 would have been entered at step 1 of 1BEP-0 RNO if reactor did not trip and did not have a negative startup rate. That the crew is in 1BEP ES-0.1 shows the reactor was tripped.

B is incorrect: Crew must perform a shutdown margin calculation within 1 hour (not IMMEDIATELY) per 1BEP ES-0.1.

C is CORRECT: 1BEP ES-0.2 has direction to emergency borate if more than 1 rod bottom lit is not lit, using 1BOA PRI-2.

D is incorrect: Crew will emergency borate using 1BOA PRI-2, not BOP CV-27. BOP CV-27 is intended for rectifying a loss of shutdown margin when the plant is in shutdown, not post-trip conditions with rods not fully inserted.

Question 76 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	15097
User-Defined ID:	
Cross Reference Number:	
Topic:	Reactor trip with rod not on bottom
Num Field 1:	4.3
Num Field 2:	4.6
Text Field:	007EA2.02
Comments:	Source: New 3/11/2014 RFP Cognitive Level: Memory Reference: 1BEP ES-0.1 K/A 007EA2.02 Reactor Trip - Ability to determine or interpret the following as they apply to a reactor trip: Proper actions to be taken if the automatic safety functions have not taken place. Question meets K/A – SRO candidate must assess the plant conditions, and select the proper procedure to direct the crew's actions upon a failure of an automatic reactor trip to fully fulfill its safety function of inserting all rods fully. 10CFR55.43(b)(5)

Associated objective(s):

ANALYZE a given set of plant conditions and DETERMINE if entry into 1/2BOA PRI-2, Emergency Boration, is required

77 **Points: 1.00**

A safety injection has occurred on Unit 2. With 2BEP-1, "Response to Loss of Reactor or Secondary Coolant" in effect, the following set of conditions is observed when Status trees were scanned:

- Subcriticality: N-41 through N-44 are indicating 3.5%
  Intermediate range startup rate is equal to +0.1 dpm
- Core Cooling: No RCPs in service
  Core Exit TCs indicate 725°F
  RCS subcooling is 0°F
  RVLIS plenum indicates 15%
- Heat Sink: All SG narrow range levels are off-scale low
  Main Feedwater pumps are tripped
  2B AF pump is tripped
  2A AF available flows are as follows:

2A SG	100 gpm
2B SG	105 gpm
2C SG	100 gpm
2D SG	100 gpm

The other CSF status trees indicate only green or yellow paths.

Which ONE (1) of the following describes the appropriate action?

A. Transition to 2BFR-S.1, "Response to Nuclear Power Generation/ATWS"

B. Transition to 2BFR-C.1, "Response to Inadequate Core Cooling"

C. Transition to 2BFR-H.1, "Response to Loss of Secondary Heat Sink"

D. Stay in 2BEP-1, "Loss of Reactor or Secondary Coolant"

Answer: C

Answer Explanation:

A is incorrect: An orange path for subcriticality is in effect, so the red path for heat sink takes priority.

B is incorrect: An orange path for core cooling is in effect, so the red path for heat sink take priority.

C is CORRECT: There is a red path for loss of heat sink, so procedure usage dictates that the BEP is exited and BFR is implemented.

D is incorrect: The BEP is exited for red or orange paths on the BSTs. If the BFR is not relevant, there will be a test within the BFR that will then redirect the crew to return to the the BRP.

Question 77 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	6106
User-Defined ID:	
Cross Reference Number:	
Topic:	Evaluation BST
Num Field 1:	4.0
Num Field 2:	4.6
Text Field:	E05G2.4.21
Comments:	Source: Bank Cognitive Level: High Reference: BSTs K/A E05G2.4.21 Loss of Secondary Heat Sink - 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. Question meets K/A – SRO candidate must know the BST flow charts and evaluate the given plant conditions for red path transitions. This is Assessment of conditions and selection of procedures. 10CFR55.43(b)(5)

Associated objective(s):

Given a set of plant conditions, DIAGNOSE and ANALYZE a Response to Loss of Secondary Heat Sink

DISCUSS the rules of priority for the Status Trees

STATE the conditions for all red paths

Given a set of plant conditions, DIAGNOSE and ANALYZE the: Heat Sink Status Tree

78	Points: 1.00

Unit 1 is in Mode 5.

- BOTH Pressurizer PORVs 1RY455A and 1RY456 are INOPERABLE and closed.

There must be at least __(1)___ RH Suction Relief Valve(s) aligned to the RCS and operable for Low Temperature Overpressure Protection, to protect against overpressure from __(2)__.

	__(1)__	___________(2)__________
A.	ONE	Reactor Coolant Pump discharge pressure
B.	ONE	Centrifugal Charging Pump pressure
C.	TWO	Reactor Coolant Pump discharge pressure
D.	TWO	Centrifugal Charging Pump pressure

Answer: D

Answer Explanation:

A is incorrect: 2 LTOP relief valves, any combination of Pzr PORVs in LTOP and aligned RH suction relief valves are required. As stated in the basis for TS 3.4.12, this will protect against a CV pump injecting. Starting an RCP will raise pressure, but not enough to overpressurize and challenge the relief valve.

B is incorrect: 2 LTOP relief valves, any combination of Pzr PORVs in LTOP and aligned RH suction relief valves are required.

C is incorrect: As stated in the basis for TS 3.4.12, this will protect against a CV pump injecting. Starting an RCP will raise pressure, but not enough to overpressurize and challenge the relief valve.

D is CORRECT: 2 LTOP relief valves, any combination of Pzr PORVs in LTOP and aligned RH suction relief valves are required. As stated in the basis for TS 3.4.12, this will protect against a CV pump injecting.

Question 78 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	13163
User-Defined ID:	
Cross Reference Number:	
Topic:	RH relief valves for LTOP
Num Field 1:	3.2
Num Field 2:	3.4
Text Field:	025AA2.06
Comments:	Source: New 3/6/2014 RFP Cognitive Level: Memory Reference: TS 3.4.12 and basis K/A 025AA2.06 Ability to determine and interpret the following as they apply to the Loss of Residual Heat Removal System: Existence of proper RHR overpressure protection. Question meets K/A – SRO candidate must be able to apply the requirement for cold overpressure protection, which is when RHR system is used. The SRO must know the basis for the TS limitation. 10CFR55.43(b)(2)

Associated objective(s):

DESCRIBE how the RH System is protected against overpressure

79 **Points: 1.00**

Unit 1 crew is responding to an Uncontrolled Depressurization of All Steam Generators, 1BCA-2.1.

- All SG's have depressurized to containment pressure.
- RCS pressure is RISING.
- CNMT Fuel Handling Incident monitors 1AR011 and 1AR012 indicate GREEN.

The highest pressure and shortest time at which the SRO must direct termination of containment spray is when Containment pressure is less than...

A. 5 PSIG with no time requirement for spray actuation.

B. 5 PSIG, after spray actuation for 8 hours.

C. 15 PSIG with no time requirement for spray actuation.

D. 15 PSIG, after spray actuation for 8 hours.

Answer: C

Answer Explanation:

A is incorrect: 5 PSIG is the number for ADVERSE containment, not the spray termination requirement. 8 hours spray is required for a primary LOCA.

B is incorrect: 5 PSIG is the number for ADVERSE containment, not the spray termination requirement.

C is CORRECT: With only a secondary break indicated, as shown by the symptoms, CS is terminated when pressure is <15 PSIG. There is no time requirement for CS on a secondary fault.

D is incorrect: 8 hours spray is required for a primary LOCA.

Question 79 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	5258
User-Defined ID:	
Cross Reference Number:	
Topic:	CS termination criteria on secondary fault
Num Field 1:	3.7
Num Field 2:	4.7
Text Field:	E12G2.4.6
Comments:	Source: Bank Cognitive Level: Memory Reference: 1BCA 2.1 K/A E12G2.4.6 Uncontrolled Depressurization of All Steam Generators - Knowledge of EOP mitigation strategies. Question meets K/A – SRO candidate must direct the activities of the EOP to mitigate the consequences of all SGs faulted in containment. It is the SRO responsibility to select the proper actions and direct the ROs to perform these NON immediate actions. 10CFR55.43(b)(5)

Associated objective(s):

T.EP3-04 Temporary Objective for Exam Bank Questions

EXPLAIN the basis for, or intent, of each note, step, and caution of CA-2.1

RECOGNIZE plant response that results in entry into CA-2.1

80 **Points: 1.00**

Unit 1 is at 25% with a power ascension at 0.3 MW/min in progress.

- 1A, 1B and the Startup Feedwater pumps are in standby.

1C Main Feedwater Pump TRIPS.

The SRO must direct the crew to...

A. close the 1C Feedwater Pump Recirc Valve 1FW012C, trip the reactor and enter 1BEP-0, Reactor Trip or Safety Injection.

B. start the 1A Main Feedwater Pump and throttle open 1A MFWP Discharge Valve 1FW016.

C. close the 1C Feedwater Pump Recirc Valve 1FW012C, trip the Main Turbine and enter 1BOA TG-8, Turbine Trip Below P8.

D. verify 1CD210A & B, CP Bypass Valves are OPEN and stop the power ascension.

Answer: A

Answer Explanation:

A is CORRECT: With no feedwater pumps running, 1BOA Sec-3 provides RNO direction with power less than 700 MW to trip the reactor.

B is incorrect: If power is >700 MW, and another FW pump is running, then 1BOA Sec-1 has actions to start the 1A MFWP.

C is incorrect: The candidate may see that power is below P8 (30%), and mistakenly decide to enter the procedure that controls a turbine trip at low power.

D is incorrect: These are the actions to direct if there is a running FW pump at power <700 MW.

Question 80 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	7411
User-Defined ID:	
Cross Reference Number:	
Topic:	Low power single feed pump trip
Num Field 1:	3.5
Num Field 2:	3.7
Text Field:	054AA2.05
Comments:	Source: Bank Cognitive Level: High Reference: 1BOA Sec-1 K/A 054AA2.05 Loss of Main Feedwater - Ability to determine and interpret the following as they apply to the Loss of Main Feedwater: Status of MFW pumps, regulating and stop valves. Question meets K/A – SRO candidate must evaluate the plant conditions, and with power less than 700 MW, to perform the RNO step to order an manual reactor trip. Part of the selected actions is to determine the status of regulating and stop valves. This is also selection of appropriate procedures. 10CFR55.43(b)(5)

Associated objective(s):

Given a step, note or caution from 1/2BOA SEC-1, Secondary Pump Trip, EXPLAIN the basis of that note, caution or step

ANALYZE a given set of conditions and DESCRIBE the required pump and system line-up requirements per 1/2BOA SEC-1

81	Points: 1.00

Unit 1 is in MODE 6, with a full core offload in progress.

- Power was lost from AC Instrument Bus 111.

With no operator action, source range instrument(s) _____(1)_____ is/are ENERGIZED and core alterations ___(2)___ continue.

	_____(1)______	___(2)___
A.	N-31 and N-32	CAN
B.	N-31	can NOT
C.	N-32	CAN
D.	N-32	can NOT

Answer: D

Answer Explanation:

A is incorrect: N31 is deenergized.

B is incorrect: N31 is deenergized..

C is incorrect: Core alterations may not continue without 2 SR channels.

D is CORRECT: N32 is energized, and core alterations may not continue without 2 SR channels.

Question 81 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28669
User-Defined ID:	
Cross Reference Number:	
Topic:	Core Alts with loss of AC Inst 111
Num Field 1:	3.0
Num Field 2:	4.
Text Field:	057G2.1.36
Comments:	Source: New 3/11/2014 RFP Cognitive Level: High Reference: 1BOA ELEC-2, 1BOA INST-1 K/A 057G2.1.36 Loss of Vital AC Electrical Instrument Bus - Knowledge of procedures and limitations involved in core alterations. Question meets K/A - SRO candidate must know the which SR instrument is affected by the loss of the AC bus, and apply the limitations of core alterations in that 2 redundant Source Range instruments must be operable, and evaluate the situation. 10CFR55.43(b)(7)

Associated objective(s):

ANALYZE a given set of plant conditions and DETERMINE the required actions per PER 1/2BOA ELEC-2, Loss of Instrument Bus

Unit 1 is at 100% power.

- The crew is evaluating a Steam Generator tube leak and has entered 1BOA SEC-8, "Steam Generator Tube Leak".
- Letdown flow is 120 GPM.
- Pressurizer level is stable, with seal injection and leakoff flows normal.
- Charging flow is 135 GPM.

Which of the following is the approximate amount of primary to secondary leakage, and what action is required per 1BOA SEC-8?

A. LESS than 10 GPM; Place unit in MODE 3 within 3 hours.

B. LESS than 10 GPM; Trip Unit 1 reactor and enter 1BEP-0, "Reactor Trip or Safety Injection".

C. MORE than 10 GPM; Place unit in MODE 3 within 3 hours.

D. MORE than 10 GPM; Trip Unit 1 reactor and enter 1BEP-0, "Reactor Trip or Safety Injection".

Answer: A

Answer Explanation:

A is CORRECT: 135 GPM charging flow - 120 GPM letdown flow - 12 GPM seal return flow = 3 GPM leakage. 1BOA SEC-8 requires unit in MODE 3 within 3 hours for a leak > 100 gallons per DAY.

B is incorrect: 1BOA SEC-8 does not require a reactor trip for a leak of this size, but it would for a larger leak.

C is incorrect: If candidate fails to account for seal leakage, they will think leakage is > 10 GPM, which is the limit for IDENTIFIED LEAKAGE, not SGTL.

D is incorrect: If candidate fails to account for seal leakage, they will think leakage is > 10 GPM, which is the limit for IDENTIFIED LEAKAGE, not SGTL. 1BOA SEC-8 does not require a reactor trip for a leak of this size, but it would for a larger leak.

Question 82 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	5709
User-Defined ID:	
Cross Reference Number:	
Topic:	Evaluating SGTL and TS
Num Field 1:	3.4
Num Field 2:	3.7
Text Field:	037AA2.04
Comments:	Source: New 3/11/2014 RFP Cognitive Level: High Reference: 1BOA SEC-8 and TS 3.4.13 K/A 037AA2.04 Steam Generator Tube Leak - ability to determine and interpret the following as they apply to the SGTL: Comparison of RCS fluid inputs and outputs, to detect leaks. Question meets K/A – SRO candidate must evaluate the RCS charging and letdown, and know what normal seal injection and leakoff flows are to quantify the leak rate. Then, the SRO must use procedure knowledge to know what the time limits are for the shutdown they will have to direct. 10CFR55.43(b)(2)

Associated objective(s):

ANALYZE a given set of plant conditions and DETERMINE the required actions per 1/2BOA SEC-8, Steam Generator Tube Leak

ANALYZE a given set of plant conditions and DETERMINE if entry into 1/2BOA SEC-8, Steam Generator Tube Leak, is required

DESCRIBE the actions necessary to stabilize the plant following a Steam Generator Tube Leak

83	Points: 1.00

Unit 1 was at 100% power when an automatic reactor trip and safety injection occurred.

- Aux Building WRGM 1PR30J has indicated 7 E+09 uCi/sec for 19 minutes, and
- Aux Building WRGM 2PR30J has indicated 6 E+09 uCi/sec for 17 minutes.
- Dose assessment has not yet been completed.
- No classification of the event has yet been completed.
- Security reports all security conditions are normal.
- There have been no reports received from the State of Illinois.
- The wind direction is from 045°.

The Shift Emergency Director will declare the event to be a __(1)__, and recommend __(2)__.

	(1)	(2)
A.	Site Area Emergency	no protective actions
B.	General Emergency	SHELTER 2 mile radius and 5 miles in subareas 14, 17, 19, 20, 23 and 25
C.	General Emergency	EVACUATE 2 mile radius and 5 miles in subareas 14, 17, 19, 20, 23 and 25
D.	General Emergency	EVACUATE 2 mile radius and 5 miles in subareas 19, 20 and 23

Answer: D

Answer Explanation:

A is incorrect: The individual WRGMs each meet SAE, but the SUM meets the GE classification. Evacuation is required.

B is incorrect: With a GE and NO impediments, Shelter would NOT be recommended.

C is incorrect: PAR evaluation requires evacuation of the down wind sectors, The listed sectors are from page 2 of the procedure and are from a table NOT used for PARS.

D is CORRECT: Sum of the WRGMs is 1.4 E+09 uCi/sec for >15 minutes, so the event is a General Emergency. PAR evaluation is for evacuation of the listed downwind sectors.

Question 83 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28670
User-Defined ID:	
Cross Reference Number:	
Topic:	Evacuation evaluation
Num Field 1:	3.5
Num Field 2:	4.2
Text Field:	061AA2.05
Comments:	**Provide References: Byron Annex E-Plan Matrix and PAR flowchart** Source: New 3/11/2014 RFP Cognitive Level: High Reference: EP-AA-1002 and PAR Flowchart K/A 061AA2.05 Area Radiation Monitoring System Alarms - Ability to determine and interpret the following as they apply to the ARM System Alarms: Need for area evacuation; check against existing limits. Question meets K/A – SRO candidate must evaluate the provided reading against the EAL matrix, determine the event classification and then determine that the PAR requires evacuation. This is a responsibility of the Emergency Director for Emergency Plan activities. 10CFR55.43(b)(5)

Associated objective(s):

LIST the responsibilities of the Shift Emergency Director to include: PAR determination

84	Points: 1.00

According to the basis for the Reactor Core Safety Limit, 2.1.1, overheating of the fuel is prevented by...

A. ensuring 4 RCS loops remain in operation to provide adequate heat removal to prevent Departure from Nucleate Boiling.

B. keeping the Linear Heat Rate below the point at which fuel centerline melting occurs.

C. setting the Pzr Low Pressure Safety Injection setpoint such that bulk boiling is prevented in the event of a loss of RCS integrity.

D. having a variable OTDT setpoint that becomes more conservative as power rises to limit the combination of Thermal Power and Pressure.

Answer: B

Answer Explanation:

A is incorrect: Prevention of DNB protects the fuel cladding.

B is CORRECT: From the Bases Background: "Overheating of the fuel is prevented by maintaining the steady state peak Linear Heat Rate below the level at which fuel centerline melting occurs.

C is incorrect: Low Pzr Pressure SI protects from DNB.

D is incorrect: OTDT trip protects from DNB.

Question 84 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28671
User-Defined ID:	
Cross Reference Number:	
Topic:	Safety limit basis
Num Field 1:	3.2
Num Field 2:	4.2
Text Field:	E06G2.2.25
Comments:	Source: New 3/11/2014 RFP Cognitive Level: Memory Reference: B2.1.1 K/A E06G2.2.25 Degraded Core Cooling - Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits. Question meets K/A – SRO candidate must know the basis for the facility Safety Limits. This is SRO knowledge of the operating limitations in the TS and their bases. 10CFR55.43(b)(2)

Associated objective(s):

STATE the Safety Limit Technical Specifications including: Basis

85 **Points: 1.00**

Unit 1 is in MODE 4.

- Cooldown of the RCS and Pressurizer is in progress, using RHR with 1D RCP running.
- The NSO has recorded the following temperatures:

	RCS Tcold	Pzr Liquid
08:00	320°F	460°F
08:30	260°F	400°F
09:00	210°F	340°F

In accordance with TS and TRM requirements, the SRO will...

A. allow the cooldown of both the RCS and Pzr to continue.

B. stop the cooldown of both the RCS and Pzr.

C. stop the cooldown of the RCS and allow the cooldown of the Pzr to continue.

D. stop the cooldown of the Pzr and allow the cooldown of the RCS to continue.

Answer: C

Answer Explanation:

A is incorrect: The RCS cooldown is 110°F/hour, higher than allowed. RCS cooldown must be stopped.

B is incorrect: The Pzr cooldown is 120°F/hour, within limits. Pzr cooldown may continue.

C is CORRECT: TS 3.4.3 limits RCS cooldown to 100°F per hour. There is an admin limit of 50°F per hour if AF is using SX or no RCPs are on, but that doesn't apply in this situation. TRM 3.4.c limits the Pzr cooldown to 200°F per hour, with a heatup limit of 100°F per hour.

D is incorrect: The RCS cooldown is 110°F/hour, higher than allowed. RCS cooldown must be stopped. The Pzr cooldown is 120°F/hour, within limits. Pzr cooldown may continue.

Question 85 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28672
User-Defined ID:	
Cross Reference Number:	
Topic:	TS and TRM RCS and Pzr cooldown limits
Num Field 1:	3.4
Num Field 2:	4.7
Text Field:	E08G2.2.40
Comments:	Source: New 3/12/2014 RFP Cognitive Level: High Reference: TS 3.4.3, TRM 3.4.c, Unit 1 PTLR K/A E08G2.2.40 RCS Overcooling - Ability to apply Technical Specifications for a system. Question meets K/A – SRO candidate must evaluate the cooldown rate, and apply the limits from the TS and TRM in order to provide the proper direction to the crew. 10CFR55.43(b)(2)

Associated objective(s):

EVALUATE a set of plant conditions and DETERMINE the required Technical Specification/TRM LCOs and Action Statements for the conditions given

Unit 1 is at 100% power.

10:00 The control room operators observe indications of a small RCS leak inside containment.
10:35 Personnel enter containment, and determine the 1A Loop Drain valve is leaking by, and can NOT be completely isolated.
11:00 The RO performs a leak rate calculation that determines leakage is 13 GPM.

The operators should continue to monitor plant parameters, and...

A. perform a controlled shutdown; leakage is IDENTIFIED and beyond limits.

B. perform a controlled shutdown; leakage is PRESSURE BOUNDARY and beyond limits.

C. continue plant operations; leakage is IDENTIFIED and within limits.

D. continue plant operations; leakage is PRESSURE BOUNDARY and within limits.

Answer: A

Answer Explanation:

A is CORRECT: 13 GPM exceeds the limits of 10 GPM identified leakage.

B is incorrect: Leakage is identified, not pressure boundary leakage.

C is incorrect: Plant must shutdown, 13 GPM exceeds the limits of 10 GPM identified leakage.

D is incorrect: Plant must shutdown, 13 GPM exceeds the limits of identified leakage and the 0 GPM limit of pressure boundary leakage.

Question 86 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	5395
User-Defined ID:	
Cross Reference Number:	
Topic:	RCS leakage response, TS 3.4.13
Num Field 1:	3.6
Num Field 2:	4.2
Text Field:	004A2.03
Comments:	Source: Bank Cognitive Level: High Reference: TS 3.4.13 K/A 004A2.03 Chemical and Volume Control System - Ability to predict the impacts of the following malfunctions or operations on the CVCS; and based on those predications, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Boundary isolation valve leak. Question meets K/A – SRO candidate must evaluate the plant leakage and apply the TS requirements for identified leakage to it. The SRO must know the difference between different categories of leakage and the requirment to shutdown the plant. 10CFR55.43(b)(2)

Associated objective(s):

DESCRIBE the actions necessary to stabilize the plant following the onset of Excessive Primary Plant Leakage

ANALYZE a given set of plant conditions and DETERMINE the required actions per 1/2BOA PRI-1, Excessive Primary Plant Leakage

Given a set of plant conditions, DETERMINE from memory, Applicable Reactor Coolant System Tech Spec/TRM operability requirements

Unit 2 is at 100% power.

- Chemistry reports that the 2C SI Accumulator boron concentration is 2150 PPM.

The 2C SI Accumulator boron concentration is ___(1)___, and _________(2)___________.

	___(1)___	_____________________(2)_____________________
A.	within limits	normal operation may continue without restrictions
B.	too HIGH	boron concentration must be adjusted with water from the RWST using BOP SI-22, "Raising SI Accum Level in MODES 1, 2, & 3"
C.	too LOW	boron concentration must be adjusted with water from the RWST using BOP SI-22, "Raising SI Accum Level in MODES 1, 2, & 3"
D.	too LOW	the affected accumulator must be isolated from the RCS

Answer: C

Answer Explanation:

A is incorrect: Accumulator boron concentration is lower than the limit.

B is incorrect: Accumulator boron concentration is lower than the limit.

C is CORRECT: Accumulator boron concentration is lower than the limit, will move RWST water to accumulator.

D is incorrect: Accumulator boron concentration must be restored (with 72 hours), but there is no requirement to isolate the accumulator from the RCS.

Question 87 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28673
User-Defined ID:	
Cross Reference Number:	
Topic:	RWST boron concentration
Num Field 1:	3.4
Num Field 2:	3.9
Text Field:	006A2.10
Comments:	Source: New 3/12/2014 RFP Cognitive Level: High Reference: TS 3.5.4 K/A 006A2.10 Emergency Core Cooling System - Ability to predict the impacts of the following malfunctions or operations on the ECCS; and based on those predications, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Low boron concentration in SIS Question meets K/A – SRO candidate must evaluate the RWST boron concentration (the source of water for the ECCS) as being too low, and know the required actions to be directed for this situation. 10CFR55.43(b)(2)

Associated objective(s):

Given the appropriate procedures, DESCRIBE how to ensure compliance with all Tech Spec LCOs

A Unit 1 shutdown is in progress per 1BGP 100-4, Power Descension.

- Unit 1 is at 27% power.

Turbine bearing vibrations result in the following conditions:

- Annunciator 1-18-B16 TURB SUPERVSRY ALARM STPT EXCEEDED alarms.
- The NSO reports the adjacent turbine bearing vibrations are abnormal.

When Annunciator 1-18-B3 TURB SUPERVSRY TRIP STPT EXCEEDED alarms, the SRO will direct the crew to...

A. continue the plant shutdown per 1BGP 100-4, Power Descension.

B. shutdown the unit quickly using 100-4T1.1, Rapid Power Reduction flowchart.

C. trip the turbine, and the SRO will implement 1BOA TG-8, Turbine Trip Below P8.

D. trip the Reactor, and the SRO will implement 1BEP-0, Reactor Trip Or Safety Injection.

Answer: C

Answer Explanation:

A is incorrect: A normal shutdown would continue if the Trip setpoint alarm did not come in. This is plausible because the trip alarm came in after the Alert alarm, and a normal shutdown continues for an alert alarm.

B is incorrect: In some cases of turbine problems, a rapid power reduction is called for. In this case, the turbine must be tripped.

C is CORRECT: When the Trip setpoint alarm comes in, the turbine must be tripped. Since power is below P-8 (30%), a reactor trip is avoided and 1BOA TG-8 is used.

D is incorrect: The reactor would be tripped if power were above P-8. The P-8 power allowance is often forgotten, and candidates may select the reactor trip.

Question 88 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28674
User-Defined ID:	
Cross Reference Number:	
Topic:	Turbine trip below P-8
Num Field 1:	4.5
Num Field 2:	4.7
Text Field:	012G2.4.4
Comments:	Source: New 3/12/2014 RFP Cognitive Level: High Reference: 1BEP-0, 1BOA TG-8, 1BOA TG-1 K/A 012G2.4.4 Reactor Protection System - Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures. Question meets K/A – Because it is below P-8 power, the reactor trip - turbine trip function of the Reactor Protection System is blocked. This is a permissive based on Reactor power level, and is the "system operating parameter" the SRO candidate must evaluate. The SRO must then determine the actions to take for the given situation, and select the procedure that applies to the situation. This is a transition from a BOA, not a direct entry, hence it is an SRO-only determination of the entry conditions for the emergency or abnormal procedures. 10CFR55.43(b)(5)

Associated objective(s):

Given a set of plant conditions, ANALYZE those conditions and DETERMINE if conditions exist that demand a Reactor Trip, that would allow blocking (Permissives) and/or that would actuate any control systems/devices associated with RPS

Unit 1 has experienced a reactor trip and SI from 100% power.

- At the time of the trip, Unit 1 lost off-site power and it has not been restored.
- The crew has transitioned to 1BEP ES-1.1, SI TERMINATION, from 1BEP-1, LOSS OF REACTOR OR SECONDARY COOLANT.
- At step 8 of 1BEP ES-1.1, the crew attempts to control charging flow to maintain Pressurizer level stable.
- Pressurizer level begins to slowly and steadily LOWER.

With the above conditions, the Unit Supervisor will direct the crew to transition to ___(1)___.
RCS temperature will be controlled by use of the ___(2)___.

	(1)	(2)
A.	1BEP ES-1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION	Steam Dumps
B.	1BEP ES-1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION	SG PORVs
C.	1BEP-1, LOSS OF PRIMARY OR SECONDARY COOLANT	Steam Dumps
D.	1BEP-1, LOSS OF PRIMARY OR SECONDARY COOLANT	SG PORVs

Answer: B

Answer Explanation:

A is incorrect: With the loss of off-site power, steam dumps are not available because the CW pumps are tripped.

B is CORRECT: 1BEP ES-1.1 directs transition to 1BEP ES-1.2 if Pzr level can't be maintained. With the loss of off-site power, steam dumps are not available because the CW pumps are tripped.

C is incorrect: 1BEP ES-1.1 directs transition to 1BEP ES-1.2 if Pzr level can't be maintained. With the loss of off-site power, steam dumps are not available because the CW pumps are tripped.

D is incorrect: 1BEP ES-1.1 directs transition to 1BEP ES-1.2 if Pzr level can't be maintained.

Question 89 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28675
User-Defined ID:	
Cross Reference Number:	
Topic:	Cooldown in BEP ES-1.2
Num Field 1:	3.1
Num Field 2:	3.2
Text Field:	039A2.01
Comments:	Source: New 3/12/2014 Cognitive Level: High Reference: 1BEP ES-1.1, 1BEP ES-1.2 K/A 039A2.01 Main and Reheat Steam - Ability to predict the impacts of the following malfunctions or operations on the MRSS; and based on those predications, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Flow paths of steam during a LOCA. Question meets K/A – SRO candidate must evaluate the plant conditions of 1BEP ES-1.1, select the correct procedure to transition to, and interpret the plant conditions to direct the cooldown using the steam flow path through the SG PORVs. 10CFR55.43(b)(5)

Associated objective(s):

Given a set of plant conditions or parameters indicating a need to perform or while performing a Post LOCA Cooldown, EVALUATE operator response and DETERMINE appropriate actions

Unit 1 was at 100% power.

- 1A SX pump is OOS.

A reactor trip occurred and 1BEP-0 "REACTOR TRIP OR SI" was entered.

- A Loss of All AC Power occurred two minutes later and BOTH D/Gs did NOT automatically start.
- 1A D/G was manually started at step 5 of 1BCA-0.0, LOSS OF ALL AC POWER.
- 1A D/G output breaker automatically closed and re-energized bus 141.
- 1B D/G could NOT be started.
- An EO reports 1A DG local alarm 1PL07J-1-C2, ESSENTIAL SERVICE WATER FLOW LOW is LIT solid.

Under these conditions, the next ACTION the SRO takes is to…

A. transition to 1BEP-0, REACTOR TRIP OR SAFETY INJECTION.

B. transition to 1BOA ELEC-3, LOSS OF 4KV ESF BUS.

C. transition to 1BOA PRI-7, ESSENTIAL SERVICE WATER MALFUNCTION.

D. remain in 1BCA-0.0, dispatch an operator to emergency stop the DGs and perform steps to cross tie bus 142 to bus 242.

Answer: D

Answer Explanation:

A is incorrect: This would leave the 1A DG running without cooling for an extended period of time.

B is incorrect: This is an improper transition from 1BCA-0.0.

C is incorrect: This would leave the 1A DG running without cooling for an extended period of time.

D is CORRECT: The 1A DG is running without cooling so it is immediately stopped. Further action in 1BCA 0.0 will cross tie the ESF busses with U-2 and get the 1B SX pump running to support DG cooling on U-1.
Prior to transitioning out of 1BCA-0.0 in step 5, the procedure checks to ensure DG support systems are energized. In this case the 1A DG did not have SX pump support, so transitioning out of 1BCA-0.0 is incorrect transition. 1BCA-0.0 continues to cross tie ESF buses with opposite unit according to which train has DG support equipment available. In this case bus 142 has SX pump available so it will be crosstied to Unit 2 in CA-0.0.

Question 90 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28260
User-Defined ID:	
Cross Reference Number:	
Topic:	Loss of SX in BCA 0.0
Num Field 1:	4.6
Num Field 2:	4.6
Text Field:	076G2.1.20
Comments:	Source: 2012 Byron NRC Cognitive Level: High Reference: 1BCA 0.0 K/A 076G2.1.20 Service Water - Ability to interpret and execute procedure steps. Question meets K/A – SRO candidate must predict the impacts of loss of SWS malfunction on the SX system and determine correct actions to mitigate the consequences of malfunction. This is an SRO level question because the examinee is required to assess the conditions and then select the procedure or portion of procedure to mitigate the event. 10CFR55.43(b)(5)

Associated objective(s):

DISCUSS the basic steps of the CA-0 series procedures

91	Points: 1.00

When moving irradiated fuel assemblies in the Refueling Cavity, the minimum water level above the vessel flange can be monitored __(1)__.

The Tech Spec basis for the minimum water level is to __(2)__.

	________(1)________	_______(2)_______
A.	locally and in the MCR	limit iodine fission product release
B.	locally and in the MCR	provide longer time to core boil
C.	ONLY in the MCR	limit iodine fission product release
D.	ONLY in the MCR	provide longer time to core boil

Answers: A & B

Answer Explanation:

A is CORRECT: TS 3.9.7 requires at least 23 feet above the vessel flange when moving irradiated fuel. The top of the cavity is 26 feet above the vessel, and the TS basis is to lower iodine activity.
The local and MCR indicators are both individually used in some surveillances and procedures, making it plausible that only one exists. Time to core boil is calculated and monitored, but is not a basis for TS required minimum level.

B was originally considered incorrect since time to core boil is calculated and monitored, but is not a basis for TS required minimum level. However, from a post-exam comment submitted by the licensee, this answer was considered correct also since TS 3.9.5 also specified the same water level but for reasons of preventing core boiling from occurring with only one RHR system in operation. Basis was to have 23 feet water level requirement if you were to lose the remaining RHR system.

C is incorrect: The local and MCR indicators are both individually used in some surveillances and procedures, making it plausible that only one exists.

D is incorrect: The local and MCR indicators are both individually used in some surveillances and procedures, making it plausible that only one exists. Time to core boil is calculated and monitored, but is not a basis for TS required minimum level.

Question 91 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28145
User-Defined ID:	
Cross Reference Number:	
Topic:	Refueling cavity level
Num Field 1:	2.9
Num Field 2:	3.7
Text Field:	034A1.02
Comments:	Source: Bank Cognitive Level: Memory Reference: TS 3.9.7, Refueling Cavity Water Level K/A 034A1.02 Fuel Handling Equipment: Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the Fuel Handling System controls including: Water level in the refueling canal Question meets K/A – SRO candidate must know the places to monitor and the basis for the minimum TS refueling cavity level. The "refueling canal" ties together the spent fuel pool and refueling cavity. There is no monitoring equipment or design limit associated specifically with the refueling canal. When in use, it is connected to the refueling cavity water, and hence its water level will be the same as the refueling cavity water level, which IS monitored and has design limits. This meets 10CFR55.43b: item 4: Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions. 10CFR55.43(b)(4)

Associated objective(s):

Given a set of plant conditions during Fuel Handling operations, EVALUATE the conditions and DETERMINE required actions as outlined in OU-AP-200, Administrative Controls During Fuel Handling Activities for Byron and Braidwood

92 **Points: 1.00**

The 0E Waste Gas Decay Tank has been sampled by Chemistry and reported to contain 9.0 E+4 Curies.

- The tank pressure is 75 psig.

The SRO's required action AND mitigating strategy to control the release associated with this Waste Gas Decay Tank will be to...

	Action	Mitigating Strategy
A.	enter 0BOA RAD-3, DECAY TANK HIGH ACTIVITY	pressurize WGDT to 95 psig with nitrogen gas
B.	isolate the WGDT.	let WGDT decay for 30 days
C.	enter 0BOA RAD-3, DECAY TANK HIGH ACTIVITY	transfer some of the tank contents to another WGDT
D.	place standby WGDT on line.	perform a release of 0E WGDT

Answer: C

Answer Explanation:

A is incorrect: Pressurizing the WGDT with N2 is considered plausible based on N2 connections to the Waste Gas System and pressurizing the system may be a misconception to dilute the tank contents.

B is incorrect: Isolating the tank is a plausible distractor if the examinee is not aware of entry conditions to the BOA, letting the tank decay for 30 days is also plausible.

C is CORRECT: 0BOA RAD-3 step 2.b transfers the GDT to equalize activity.

D is incorrect: Placing another WGDT in standby and performing a release of the 0E WGDT is plausible if the candidate believes there is no problem.

Question 92 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28334
User-Defined ID:	
Cross Reference Number:	
Topic:	GDT high activity
Num Field 1:	3.3
Num Field 2:	3.6
Text Field:	071A2.02
Comments:	Source: 2012 Byron NRC Cognitive Level: Memory Reference: 0BOA RAD-3 K/A 071A2.02 Waste Gas Disposal System - Ability to predict the impacts of the following malfunctions or operations on the WGDS; and based on those predications, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Use of waste gas release monitors, radiation, gas flow rate and totalizer. Question meets K/A – SRO candidate must have knowledge of entry condition to BOA (RO Level) and assessing plant conditions and implementing a mitigating strategy (SRO level) for high activity associated with a waste gas decay tank. 10CFR55.43(b)(5)

Associated objective(s):

ANALYZE a given set of plant conditions and DETERMINE the required actions per 0BOA RAD-3, Decay Tank High Activity

93 **Points: 1.00**

Both units are at 100% power.

- The Byron area experienced an earthquake.
- 0FT-CW040, Circ Water Makeup flow indicates 0 GPM.
- Annunciator 0-38-B12, CW MAKEUP PUMP DISCH HDR PRESS LOW is LIT.
- The running 0A and 0B CW Makeup Pumps indicate 450 AMPS, in the red zone on their ammeters.
- An EO at the CW Flume reports there is NO CW makeup flow from the discharge pipe, and intake bay level is lowering at an inch per hour.

The action the SRO(s) will order and the procedure used to mitigate this situation is...

A. both Units to be immediately tripped and enter 1 and 2BEP-0, Reactor Trip Or Safety Injection.

B. the 0C CW Makeup Pump to be started per BOP CW-9, Circulating Water Make-up Pump Start-up.

C. 0CW220, CW Intake Bay Level Control Valve to be fully OPENED locally per BOP CW-27, Local Manual Control Of 0CW220.

D. CW blowdown to be secured per BOP CW-12, Circulating Water Blowdown System Startup, Operation And Shutdown.

Answer: D

Answer Explanation:

A is incorrect: Intake bay level is lowering slowly, so a reactor trip is undesirable. A controlled plant shutdown MAY be eventually called for. The Table in 0BOA SEC-11 (candidate not expected to memorize, but it is a qualifiable number) notes that worst case, there is over 8 hours until low basin level is reached which would then require a shutdown.

B is incorrect: Starting the standby makeup pump is an RNO action, but is clearly undesirable since the other pumps are running out.

C is incorrect: Opening the makeup valve is an RNO action, but would clearly not rectify the situation since there is NO flow with LOW pressure.

D is CORRECT: The makeup line is ruptured indicated by NO flow, and pump amps in red, so starting another pump or opening the CW valve won't help. A trip is not called for because the plant is not in jeopardy given the slow rate of level drop. With intake bay level lowering, the BOA calls for CW blowdown to be secured. The BAR for Intake Level High or Low calls for a start of the the standby pump or manual control of the valve, IF they are the cause. The Candidate can clearly eliminate either a pump trip or makeup valve malfunction as the cause. The BAR also calls for CW blowdown to be secured.

Question 93 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28677
User-Defined ID:	
Cross Reference Number:	
Topic:	Loss of CW makeup
Num Field 1:	4.4
Num Field 2:	4.7
Text Field:	075G2.1.7
Comments:	Source: New 3/14/2014 RFP Cognitive Level: High Reference: 0BOA SEC-11 K/A 075G2.1.7 Circulating Water - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. Question meets K/A – SRO candidate must evaluate the given plant conditions to determine the correct actions to take, and the procedure that will direct the correct actions. The procedure listed is a BOP directed from the BOA. 10CFR55.43(b)(5)

Associated objective(s):

OUTLINE operation of the following components and Circ Water Subsystems: Circ Water Makeup Control

Unit 1 experienced a loss of coolant accident.
- The crew actuated a Reactor Trip and Safety Injection.

Currently the crew is depressurizing the RCS per 1BEP ES-1.2, "Post LOCA Cooldown and Depressurization", step 20.e, with the following parameters:
- Containment pressure is 12 PSIG and slowly lowering.
- Pressurizer level is 64%.
- RCS pressure is 950 PSIG.
- RCS temperature is 500°F.

The SRO will direct the crew to ...

A. continue the depressurization because Pressurizer Level is NOT satisfied.

B. continue the depressurization because RCS Subcooling is too HIGH.

C. stop the depressurization because RCS Subcooling is too LOW.

D. stop the depressurization because at least ONE of the required parameters is met.

Answer: D

Answer Explanation:

A is incorrect: CNMT is adverse, so the 62% criteria applies, and Pzr level is 64%. Normal CNMT criteria is 69%, which the given conditions less than.

B is incorrect: The depressurization will NOT continue, because Pzr level criteria is met.

C is incorrect: Subcooling criteria is NOT met, so depressurization is not stopped because of that.

D is CORRECT: Depressurization will be stopped since the subcooling parameter is met, and pressurizer level is above the minimum required level for adverse containment. The SRO must use Figure 1BEP ES 1.2-5. If the candidate doesn't realize CNMT is adverse, they will misinterpret the required parameters.

Question 94 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28152
User-Defined ID:	
Cross Reference Number:	
Topic:	1BEP ES-1.2 usage
Num Field 1:	3.9
Num Field 2:	4.2
Text Field:	G2.1.25
Comments:	**Provided Reference: 1BEP ES-1.2 pages 27, 40 & 41** Source: Bank Cognitive Level: High Reference: 1BEP ES-1.2, Post LOCA Cooldown and Depressurization K/A G2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc. Question meets K/A – SRO candidate must use the graph from 1BEP ES-1.2 to determine required actions. This is Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. 10CFR55.43(b)(5)

Associated objective(s):

Given a set of plant conditions or parameters indicating a need to perform or while performing a Post LOCA Cooldown, EVALUATE operator response and DETERMINE appropriate actions

95 **Points: 1.00**

During a refueling outage with RCS boron concentration LESS than the limit specified in the COLR, it is PROHIBITED to remove...

A. the reactor vessel head.

B. a rod control cluster assembly.

C. the upper internals assembly.

D. an irradiated sample specimen.

Answer: B

Answer Explanation:

A is incorrect: Removing the head is not a core alteration.

B is CORRECT: OU-AP-200 and TS 3.9.1 require a COLR specified boron concentration; if below the limit, core alterations must be stopped. A core alteration is defined as the movement of any fuel, sources, or reactivity control components within the reactor vessel with the vessel head removed and fuel in the vessel. A RCCA is a reactivity control component.

C is incorrect: Removing the upper internals is not a core alteration.

D is incorrect: A sample specimen is not a core alteration.

Question 95 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	9624
User-Defined ID:	
Cross Reference Number:	
Topic:	Prohibited core alteration
Num Field 1:	2.8
Num Field 2:	3.7
Text Field:	G2.1.41
Comments:	Source: Bank Cognitive Level: Memory Reference: OU-AP-200 Section 2.1 K/A G2.1.41 - Knowledge of the Refueling Process. Question meets K/A – SRO candidate must know the requirements for boron concentration in the refueling cavity, and must know what constitutes a core alteration during the refueling process. Procedures and limitations involved in initial core loading, alterations in core configuration, control rod programming, and determination of various internal and external effects on core reactivity. This activity is an SRO-Only activity. ROs at Byron do NOT move fuel, handle fuel, or oversee fuel movement or core alterations. 10CFR55.43(b)(b)

Associated objective(s):

Given the appropriate procedure, DESCRIBE areas of concern when supervising a refueling outage

Old Import of questions - Review for deletion

96 **Points: 1.00**

Unit 1 is in MODE 2, performing Physics Tests during a post refueling startup.
The RO reports the following conditions:

- Shutdown Margin is determined to be 1200 pcm.
- The lowest RCS loop Tave is 540°F.
- Shutdown Bank A group step counter indicates 220 steps.
- Reactor Power is 4%.

In accordance with TS 3.1.8, "Physics Tests Exceptions - MODE 2", the SRO will suspend physics testing exceptions and will order...

A. RCS boration initiated within 15 minutes.

B. lowest loop Tave to be raised to $\geq$ 550°F within 20 minutes

C. Shutdown Bank A to be withdrawn to $\geq$ 224 steps within 2 hours.

D. the Reactor Trip Breakers to be opened immediately.

Answer: A

Answer Explanation:

A is CORRECT: In accordance with TS 3.1.8, the LCOs for Min Temp For Criticality, SD Bank Insertion Limits (among others) are suspended during physics testing and 530°F is the lower limit for Tave. However, SDM is not met: 1300 pcm is required. TS 3.1.8 Condition A requires boration initiated within 15 minutes.

B is incorrect: This is the action for Minimum Temperature for Criticality, which is exempted during physics testing.

C is incorrect: This is the limit for SD rod insertion, but is exempted during physics testing.

D is incorrect: This is TS 3.1.8 Condition B action if power were to be raised above 5%.

Question 96 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28678
User-Defined ID:	
Cross Reference Number:	
Topic:	Physics testing in MODE 2
Num Field 1:	4.5
Num Field 2:	4.4
Text Field:	G2.2.1
Comments:	Source: NEW 3/15/2015 RFP Cognitive Level: High Reference: TS 3.1.8, COLR K/A G2.2.1 - Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity. Question meets K/A – SRO candidate must evaluate the reported conditions and apply the TS exceptions statements for physics testing. This is TS knowledge, but it is not *solely* knowledge of the TS LCO nor *solely* knowledge of the required actions, but the evaluation of the LCO and application of the proper required actions. Physics testing is done at the beginning of the plant startup, and specifically, this calls out for operation of reactivity control equipment: ie, boration. 10CFR55.43(b)(2)

Associated objective(s):

ANALYZE a given set of plant conditions and DETERMINE the required actions per GP 100-2, Plant Startup

97 **Points: 1.00**

Unit 1 is at 100% power.

Which valve failure(s) will result in the Emergency Core Cooling System UNABLE to meet its safety function?

A. 1CV182, RCP Seal flow backpressure control valve, failed OPEN.

B. 1SI8812A, RWST to RH pump suction valve, and 1SI8811A, RH pump CNMT sump suction valve, BOTH failed OPEN.

C. 1SI8807A and 1SI8807B, CV and SI pump crosstie valves, failed CLOSED.

D. 1CV8804A and 1SI8804B, RH to CV and SI pump suction valves, failed CLOSED.

Answer: D

Answer Explanation:

A is incorrect: Plausible, in that if the seal injection throttle valves are too far open, injection flow could be lower than design. There is a surveillance to verify throttle valve position.

B is incorrect: Plausible in that a failure to close this valve would result in RWST draining to the CNMT sump on recirc actuation. The water is fully available to the RH pumps when in the sump.

C is incorrect: These are parallel suction header crosstie valves to allow all CV and SI pumps to be supplied from 1 RH pump in the event of a pump trip. However, other valve alignments will supply water to the pumps even if they failed. This is evidenced by the existence of 1SI8924, a single valve in series with these two paralleled valves.

D is CORRECT: The listed valves must be able to be opened for the RH pumps to supply the CV and SI pumps for cold leg recirculation.

Question 97 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28679
User-Defined ID:	
Cross Reference Number:	
Topic:	Operability determination
Num Field 1:	3.6
Num Field 2:	4.6
Text Field:	G2.2.37
Comments:	Source: New 3/15/2014 RFP Cognitive Level: Memory Reference: TS Basis 3.5.2 K/A G2.2.37 - Ability to determine operability and/or availability of safety related equipment. Question meets K/A – SRO candidate must determine whether ECCS will operate properly with a variety of valves in failed positions, using basis knowledge from Tech Specs for the ECCS safety function. This is an SRO-Only function. Discussion with 3 Byron SROs and 2 Byron ROs determined that the ROs do not have the responsibility to determine Safety Function applicability, or the knowledge. This question could be written as an SRO-Only JPM to use the Safety Function Determination Program, so it meets the SRO-Only category. 10CFR55.43(b)(2)

Associated objective(s):

Given an example, DETERMINE if an Operability Determination meets the requirements of OP-AA-108-115.

98 **Points: 1.00**

What condition could result in higher than normal radiation exposure during a containment entry?

A. MIDs in a position other than in-storage or parked at reactor vessel bottom.

B. Reactor power raised from 97% to 99% power.

C. Operating an RH pump on recirculation.

D. Filling an SI accumulator with an SI pump.

Answer: A

Answer Explanation:

A is CORRECT: The detectors are fission chamber detectors that become very radioactive. The MIDs must be in either of the listed parking areas for a CNMT entry, which is verified by the WEC Supervisor, an SRO.

B is incorrect: Power must be held steady with 2% for a CNMT entry, so this is within acceptable normal limits.

C is incorrect: The RH pump recirculation flow goes to the RWST, so any contamination would not be in CNMT.

D is incorrect: Filling the accumulators with an SI pump draws a suction on the RWST, a normal activity that would not raise dose rates.

Question 98 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	0
Difficulty:	3.00
System ID:	6701
User-Defined ID:	
Cross Reference Number:	
Topic:	Rad hazards during CNMT entry
Num Field 1:	3.4
Num Field 2:	3.8
Text Field:	G2.3.13
Comments:	Source: Bank Cognitive Level: Memory Reference: BOP IC-7 K/A G2.3.13 - Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc. Question meets K/A – SRO candidate must approve the CNMT entry checklist, including verifying the MIDs are parked in the proper place and OOS. The ROs have no responsibility or knowledge of this activity. This meets knowledge of "radiation hazards that may arise during normal and abnormal situations." 10CFR55.43(b)(4)

Associated objective(s):

DISCUSS the restrictions applicable for entry inside the Reactor Incore Sump Area

99	Points: 1.00

Unit 1 Is in MODE 3.

- Cooldown is in progress when 1BOA PRI-1, Excessive Primary Plant Leakage, is entered due to unexpected VCT makeup.
- RCS pressure: stable at 700 psig
- RCS temperature: stable at 400°F
- Pressurizer level: 27% and slowly decreasing
- Charging flow: 145 gpm
- Letdown is ISOLATED.

To what procedure and step will the SRO go next?

A. 1BOA Pri-1, Step 3: Check Pzr pressure.

B. 1BOA Pri-1, Step 22: Check RH System status.

C. 1BOA S/D-2, Step 1: Check if RH pumps should be stopped.

D. 1BEP-0, Step 1: Verify Reactor trip.

Answer: C

Answer Explanation:

A is incorrect: >120 GPM is beyond the capabilities of 1BOA PRI-1.

B is incorrect: >120 GPM is beyond the capabilities of 1BOA PRI-1.

C is CORRECT: Accumulators are isolated, so 1BOA S/D-2 is the proper procedure to deal with a shutdown LOCA.

D is incorrect: With accumulators isolated and ECCS system in shutdown mode alignment, 1BOA S/D-2 is the proper procedure selection.

Question 99 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	7388
User-Defined ID:	
Cross Reference Number:	
Topic:	BOA PRI-1 usage
Num Field 1:	3.8
Num Field 2:	4.2
Text Field:	G2.4.9
Comments:	Source: Bank Cognitive Level: High Reference: 1BOA PRI-1 K/A G2.4.9 - Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies. Question meets K/A – SRO candidate must know the proper accident mitigation strategy in a shutdown mode with accumulators isolated, and direct the proper procedure transition. 10CFR55.43(b)(5)

Associated objective(s):

DESCRIBE the actions necessary to stabilize the plant following the onset of Excessive Primary Plant Leakage

ANALYZE a given set of plant conditions and DETERMINE if entry into 1/2BOA S/D-2, Shutdown LOCA, is required

ANALYZE a given set of plant conditions and DETERMINE the required actions per 1/2BOA PRI-1, Excessive Primary Plant Leakage

100	Points: 1.00

Unit 1 is at 100% power.

- A fire exists in Unit 1 Auxiliary Building and the Fire Brigade is on the scene.
- Concurrently, plant conditions require the use of a BOA and the MCR operators are performing that BOA.
- BOP FR-1, Fire Response Guidelines, requires a breaker to be tripped that is required to be closed by the BOA.

The breaker must be...

A. positioned in accordance with Fire Chief direction.

B. positioned in accordance with Shift Manager direction.

C. tripped OPEN.

D. maintained CLOSED.

Answer: B

Answer Explanation:

A is incorrect: The Fire Chief will provide advice, but the SM has the final decision.

B is CORRECT: In accordance with BOP FR-1, the SM (or designee) will concur with the actions taken in case of conflict of these procedures.

C is incorrect: Positioned according to SM.

D is incorrect: Positioned according to SM.

Question 100 Info	
Question Type:	Multiple Choice
Status:	Active
Always select on test?	No
Authorized for practice?	No
Points:	1.00
Time to Complete:	3
Difficulty:	3.00
System ID:	28680
User-Defined ID:	
Cross Reference Number:	
Topic:	Conflict between fire procedure and BOA
Num Field 1:	3.4
Num Field 2:	3.9
Text Field:	G2.4.27
Comments:	Source: New 3/15/2014 Cognitive Level: Memory Reference: BOP FR-1 K/A G2.4.27 - Knowledge of “fire in the plant” procedures. Question meets K/A – SRO candidate is responsible for resolving procedure conflicts. The Fire Protection system is part of Byron's facility license, and the SRO is responsible for knowing conditions and limitation in the license. 10CFR55.43(b)(1)

Associated objective(s):

Given a set of plant conditions involving the use of a BGP or an OA, EVALUATE operator action and determine appropriate response