QUESTION # 1 OCTOBER 2009

Which of the following is the expected plant response to a failed jet pump?

A. Actual Core flow increases; Indicated Core flow increases

B. Actual Core flow decreases; Indicated Core flow increases

C. Actual Core flow decreases; Indicated Core flow decreases

D. Actual Core flow increases; Indicated Core flow decreases

ANSWER: B

KA # & KA VALUE:	295001 AK2.07 Knowledge of the interrelations between partial or complete loss of forced core flow circulation and the following: Core flow indications (3.4 / 3.4)
REFERENCE:	SD000178 Pages 21 & 22
SOURCE:	New
LO:	5023a Predict the impact on the RRC System of each of the following conditions or events: a. Jet Pump Failure
RATING:	L3
ATTACHMENT:	None
JUSTIFICATION:	Per the reference, with a failed jet pump actual core flow decreases and indicated core flow increases. B is correct

QUESTION # 2 OCTOBER 2009

Columbia experienced a loss of electrical power sources that required entry into PPM 5.6.1, Station Blackout.

Which of the following lists the pumps available for RPV level control?

A. Only HPCS-P-1 should be available.

B. Only RCIC-P-1 should be available.

C. Both HPCS-P-1 and RCIC-P-1 should be available.

D. Neither HPCS-P-1 nor RCIC-P-1 should be available.

ANSWER: C

KA # & KA VALUE: 295003 AK1.06 Knowledge of the operational implications of the following concepts as they apply to partial or complete loss of AC Power: Station Blackout: (3.8 / 4.0)

REFERENCE: PPM 5.6.1 Page 4 & 5.

SOURCE: New

LO: 11829 Describe the effects of a station blackout on the electrical plant.

RATING: H2

ATTACHMENT: None

JUSTIFICATION: Entry into PPM 5.6.1 requires a loss of all: MG, TR-S, TR-B, DG-1 and DG-2. DG-3 (powering SM-4 and HPCS-P-1) and RCIC are still available for level control. C is correct.

QUESTION # 3 OCTOBER 2009

Columbia is operating with a normal 100% power lineup when a loss of DC Bus S1-1 occurs.

Which of the following indicates the pumps that remain available to assure a safe plant shutdown?

A. RCIC-P-1 and HPCS-P-1.

B. RHR-P-2B, RHR-P-2C and RCIC-P-1.

C. RHR-P-2B, RHR-P-2C and HPCS-P-1.

D. RHR-P-2B, RHR-P-2C, RCIC-P-1 and HPCS-P-1.

ANSWER: C

KA # & KA VALUE: 295004 AA1.02 Ability to operate and/or monitor the following as they apply to partial or complete loss of D.C. POWER : Systems necessary to assure safe plant shutdown (3.8 / 4.1)

REFERENCE: SD000188 Page 25

SOURCE: New

LO: 7652 Predict the effect a failure of 125VDC bus S1-1 will have on b. RCIC, c. RHR, d. LPCS

RATING: L3

ATTACHMENT: None

JUSTIFICATION: A loss of Div. 1 125VDC causes a loss of control power to RHR-P-2A and LPCS-P-1. RCIC cannot be started and trips if running. RHR-P-2B, RHR-P-2C and HPCS-P-1 remain unaffected (C is correct)

QUESTION # 4 OCTOBER 2009

Columbia is starting up with Reactor power at 26% power.

If the Main Turbine trips, which of the following is correct?

A. The Reactor scrams as a direct result of the Main Turbine trip.

B. The Reactor scrams due to low RPV level caused by the Main Turbine trip.

C. Reactor power goes down due to the increase in feedwater temperature.

D. Reactor power goes up due to a decrease in feedwater temperature.

ANSWER: D

KA # & KA VALUE: 295005 AK2.02 Knowledge of the interrelations between Main Turbine Generator trip and the following: Feedwater temperature (2.9 / 3.0)

REFERENCE: SD000163 Pages 12 and 13; SD000129 Page 40

SOURCE: Bank Modified - LO01138

LO: 11646 Explain the interrelationship between Main Turbine and the following: a. RPS; b Feedwater temperature

RATING: H3

ATTACHMENT: None

JUSTIFICATION: At 26% power the Reactor does not scram due to a MT Trip (A is incorrect). The MT trip does not cause a low RPV water level scram (B is incorrect). The MT trip does cause a loss of extraction steam to feedwater heaters which will result in a feedwater temperature decrease (C is incorrect) which will cause Reactor power to rise (D is correct)

QUESTION # 5 OCTOBER 2009

With Columbia operating at full power, a reactor scram occurs. During the scram report, CRO1 announces that several control rods do not have the “FULL IN” indication illuminated on the Full Core Display.

Which of the following is the most likely cause for this lack of indication?

A. High temperature water from the scram reduced the magnetic strength of the ‘FULL IN” position switches causing them to remain open.

B. High Control Rod Drive system pressure caused the control rod to be driven in past the “FULL IN” position switches.

C. Control Rod scram speeds during the scram caused the control rods to hit the bottom and come back out one notch past the “00” notch.

D. Air saturated water from the CSTs resulted in accumulation of air in the Control Rod Drive Mechanisms causing the loss of “FULL IN“ position indication.

ANSWER: A

KA # & KA VALUE: 295006 AA2.02 Ability to determine and/or interpret the following as they apply to SCRAM: Control rod position (4.3 / 4.4)

REFERENCE: PPM 3.3.1 Page 7

SOURCE: Bank – Modified LO01231

LO: None

RATING: H2

ATTACHMENT: None

JUSTIFICATION: COMMENT Per reference A is correct.

QUESTION # 6 OCTOBER 2009

During Control Room Evacuation, which of the following would require an Emergency Depressurization for the reason given?

A. Division 1 125 VDC Battery voltage LT 108 VDC as Division 1 ECCS pumps and valves may become inoperable.

B. Division 2 125 VDC Battery voltage LT 108 VDC as Division 2 ECCS pumps and valves may become inoperable.

C. Division 1 125 VDC Battery voltage LT 108 VDC as Division 1 Safety Relief Valves may become inoperable.

D. Division 2 125 VDC Battery voltage LT 108 VDC as Division 2 Safety Relief Valves may become inoperable.

ANSWER: C

KA # & KA VALUE:	295016 AA1.05 Ability to operate and/or monitor the following as they apply to Control Room Abandonment: D.C. Electrical Distribution (2.8 / 2.9)
REFERENCE:	ABN-CR-EVAC Page 14 and 32
SOURCE:	New
LO:	11619 Describe the physical connections and/or cause and effect relationship between the RSD System and the following: a. Main Steam System
RATING:	L2
ATTACHMENT:	None
JUSTIFICATION:	Per reference, emergency depressurization is performed when Div 1 voltage is LT 108VDC as Div 1 SRVs may become inoperable – C is correct

QUESTION # 7 OCTOBER 2009

Columbia is operating at rated power. RCC-P-1A and RCC-P-1B are running. A loss of power to SL-81 occurs.

Which of the following is correct?

A. RCC-V-6 closes due to only one RCC pump running. Per ABN-RCC the CRS directs a reactor scram and then both RRC Pumps be stopped due to no cooling available for inside containment components.

B. RCC-V-6 remains open. The CRS ensures that RCC-P-1C is running and then directs RCC-P-1B control switch be placed in PTL to prevent a restart when SL-81 is re-energized.

C. RCC-V-6 closes due to only one RCC pump running. The CRS directs RWCU be secured. CRD pump temperatures are monitored and cooling can be transferred to the Condensate Transfer header if required.

D. RCC-V-6 remains open. The CRS directs Drywell temperature and pressure be monitored. If drywell pressure is rising due to reduced RCC flow, primary containment can be vented per SOP-CN-VENT.

ANSWER: D

KA # & KA VALUE:	295018 Partial or Complete Loss of Component Cooling Water 2.2.44 Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions (4.2 / 4.4)
REFERENCE:	ABN-RCC Page 3 - 6; SD000196 Page 8 and 16
SOURCE:	New
LO:	5712 Power Supplies, 11731 Describe the physical connection and cause-and-effect relationship between RCC and AC Distribution system
RATING:	H2
ATTACHMENT:	None
JUSTIFICATION:	Loss of SL-81 leaves only one RCC pump running but the breaker for RCC-P-1B is still closed. RCC-V-6 goes closed when at least two RCC pump breakers are open therefore RCC-V-6 is still open (A and C are incorrect). RCC-P-1C is also powered from SL-81 (B is incorrect).

QUESTION # 8 OCTOBER 2009

While operating at rated power the normal Containment Instrument Air supply is lost.

Which of the following explains the effect on the Automatic Depressurization System (ADS)?

A. CIA-V-30A/B (Motor Operated ADS Header Isolation valves) close. CIA pressure is restored via backup nitrogen bottles supplying only ADS SRVs which are operated from back panels P628 and P631.

B. CIA-V-39A/B (Air Operated ADS Header Isolation valves) close. CIA pressure is restored via backup nitrogen bottles supplying only ADS SRVs which are operated from back panels P628 and P631.

C. CIA-V-30A/B (Motor Operated ADS Header Isolation valves) close. CIA pressure is restored using backup nitrogen bottles supplying all SRVs. SRV operation is from front panel P601.

D. CIA-V-39A/B (Air Operated ADS Header Isolation valves) close. CIA pressure is restored using backup nitrogen bottles supplying all SRVs. SRV operation is from front panel P601.

ANSWER: B

KA # & KA VALUE: 295019 AK2.18 Knowledge of the interrelations between partial or complete loss of instrument air and the following: ADS (3.5 / 3.5)

REFERENCE: SD000156 pages 13 and ABN-CIA pages 2 and 3

SOURCE: New

LO: 11758 Describe the physical connection and/or cause-and-effect relationship between CIA and (c.) Main Steam Safety Relief Valves

RATING: L3

ATTACHMENT: None

JUSTIFICATION: CIA-V-30A/B do not close on loss of CIA pressure (A and C are incorrect); ADS SRV operation is from back panels when pressure is supplied by backup bottles (D is incorrect; B is correct)

Columbia has been shutdown for four days following a record breaking run at full power. The RPV head is installed. RPV level is +36 inches. Both RRC pumps are off and both loops of RHR SDC have tripped. During the process to restart RHR in SDC, the operator notes recirculation loop temperatures and RWCU inlet temperature indicate 190°F. Indicated RPV pressure is rising.

Which of the following describes the reason for the rising RPV pressure?

A. Thermal stratification has occurred causing boiling in the core and steam production.

B. The temperature increase has caused a rise in indicated pressure due to increased coolant density.

C. The loss of forced core flow caused a false pressure indication due to calibration conditions of the instrument.

D. The loss of forced core flow caused water in the below core area to heat up causing boiling in the core and steam production.

ANSWER: A

KA # & KA VALUE: 295021 AK1.02 Knowledge of the operational implications of the following as they apply to loss of Shutdown Cooling: Thermal Stratification (3.3 / 3.4)

REFERENCE: ABN-RHR-SDC-LOSS page 10

SOURCE: Bank – Modified Slightly LO00226

LO: 7500

RATING: H2

ATTACHMENT: None

JUSTIFICATION: B is incorrect because a temperature increase would cause a density decrease. C is incorrect because there are no special calibration conditions for the pressure gauge. D is incorrect because a loss of forced core flow would cause the water in the under core area to cool because of CRD flow. A is correct.

QUESTION # 10 OCTOBER 2009

Columbia is in a Refueling Outage with fuel movement underway. FPC-P-1A is running. An event occurs that results in "FUEL POOL LEVEL HIGH/LOW" annunciator alarming and the Refuel Floor SRO contacting the control room reporting spent fuel pool level dropping.

Which of the following is correct?

A. FPC-P-1A trips prior to any other Fuel Pool Cooling action. The fuel bundle should be placed in the nearest safe storage location.

B. FPC-P-1A trips prior to any other Fuel Pool Cooling action. The fuel bundle should be replaced in its original location.

C. COND-V-42, Condensate Makeup, auto opens prior to any other Fuel Pool Cooling action. The fuel bundle should be placed in the nearest safe storage location.

D. COND-V-42, Condensate Makeup, auto opens prior to any other Fuel Pool Cooling action. The fuel bundle should be replaced in its original location.

ANSWER: C

KA # & KA VALUE: 295023 AA1.02 Ability to operate and/or monitor the following as they apply to Refueling Accidents: Fuel Pool Cooling and Cleanup system (2.9 / 3.2)

REFERENCE: SD000202 Pages 7, 9; ABN-FPC-LOSS Page 9

SOURCE: New

LO: 11607 Describe the Fuel Pool Cooling and Cleanup system design features and/or interlocks that provide for: d. Maintenance of adequate pool level. 6861 Given that Fuel Pool level is dropping, determine the actions required if a bundle is in transit.

RATING: H2

ATTACHMENT: None

JUSTIFICATION: ABN-FPC-LOSS directs to place any irradiated fuel bundle in transit in the closest safe storage location. The first action by the FPC System with a decreasing level in the Skimmer Surge Tanks is the opening of COND-V-42 (Condensate Make Up). C is correct. This is an RO Objective for Columbia.

QUESTION # 11 OCTOBER 2009

With Columbia in the process of starting up and reactor power at 9%, a leak in containment develops.

If Drywell pressure rises and the RHR systems receive an initiation signal, which of the following is correct?

A. RHR-P-2A and RHR-P-2B start after a 5 second time delay. RHR-P-2C starts after a 9.5 second time delay.

B. RHR-P-2A and RHR-P-2B start after a 19.4 second time delay. RHR-P-2C starts after a 9.5 second time.

C. RHR-P-2A and RHR-P-2B start after a 5 second time delay. RHR-P-2C starts immediately.

D. RHR-P-2A and RHR-P-2B start after a 19.4 second time delay. RHR-P-2C starts immediately.

ANSWER: B

KA # & KA VALUE: 295024 EA1.04 Ability to operate and / or monitor the following as they apply to High Drywell Pressure: RHR/LPCI (4.1 / 3.9)

REFERENCE: SD0000198 Page 10 and 11

SOURCE: New

LO: 11811 Describe the RHR design feature and/or interlocks which provide for: Automatic system initiation/injection.

RATING: H2

ATTACHMENT: None

JUSTIFICATION: Plant conditions are such that TR-S is still supplying power during the startup. Per reference, with TR-S supplying power, RHR A and B have a 19.4 second time delay and RHR C has a 9.5 second time delay (B is correct).

QUESTION # 12 OCTOBER 2009

The plant was operating at 99% power when a transient caused reactor pressure to rise to 1153 psig. Both Reactor Recirculation Pumps have tripped off.

Which of the following describes the reason (Bases) for the trip of the Recirculation pumps?

A. Additional negative reactivity is added by increasing the voiding in the core caused by tripping the RRC pumps.

B. Tripping the RRC pumps increases core inlet subcooling which reduces Reactor power.

C. The boiling boundary moves up the fuel channel which adds negative reactivity when the RRC pumps are tripped.

D. Tripping the RRC pumps overcomes the power increase caused by the moderator temperature increase due to the rising RPV pressure.

ANSWER: A

KA # & KA VALUE:	295025 EK3.02 Knowledge of the reason for the following response as they apply to High Reactor Pressure: Recirculation Pump trip.
REFERENCE:	SD000178 Page 22
SOURCE:	Bank – LO00319
LO:	5022 Describe the physical connection and/or the cause effect relationship between the RRC System and: d. Reactor pressure
RATING:	L2
ATTACHMENT:	None
JUSTIFICATION:	Per reference A is correct.

QUESTION # 13 OCTOBER 2009

Given that Suppression Pool level is 45 ft. and RPV pressure is 750 psig, which of the following is the maximum Suppression Pool temperature allowed prior to having to initiate a RPV pressure reduction?

A. 235°F

B. 225°F

C. 210°F

D. 175°F

ANSWER: C

KA # & KA VALUE:	295026 2.1.25 Suppression Pool High Water Temperature. Ability to interpret reference materials, such as graphs, curves, tables, etc. (3.9 / 4.2)
REFERENCE:	PPM 5.0.10 page 74 and 75
SOURCE:	Bank – Modified LR00212
LO:	11150 Given plant conditions and EOP flowcharts, evaluate plant conditions and determine the appropriate actions according to PPM 5.2.1
RATING:	H2
ATTACHMENT:	Yes – HCTL Curves
JUSTIFICATION:	When using HCTL graph and level is not on one of the lines, use the next line below to determine HCTL. On line readings is 750 psig and 215°F. The highest SP Temp would be 210°F before a pressure reduction would be required – C is correct. A and B are both in the unsafe region and D is a 'safe' reading but well below the 210° reading.

QUESTION # 14 OCTOBER 2009

Events were in progress that resulted in RPV level being the crews highest priority. RPV level is now –25 inches and trending up slow. When the CRS receives Primary Containment parameters, the CRO reports Drywell temperature as 332°F and trending up.

Which of the following actions should be taken based on this temperature and trend?

A. Concurrently enter/re-enter PPM 5.1.1 and perform an emergency depressurization per EOP 5.1.3, Emergency RPV Depressurization.

B. Concurrently enter/re-enter PPM 5.1.1 and initiate Drywell sprays with pumps not required for adequate core cooling.

C. Initiate an emergency depressurization per EOP 5.1.3, Emergency RPV Depressurization.

D. Initiate Drywell sprays with pumps not required for adequate core cooling.

ANSWER: D

KA # & KA VALUE: 205028 EK2.01 Knowledge of the interrelationships between High Drywell Temperature and the following: Drywell Spray (3.7 / 4.1)

REFERENCE: PPM 5.2.1 Block DT-8

SOURCE: New

LO: 11150 Given plant conditions and EOP flowcharts, evaluate plant conditions and determine the appropriate actions according to PPM 5.2.1

RATING: H2

ATTACHMENT: PPM 5.2.1 Blocks DT-8 and down to ED required block

JUSTIFICATION: EOP 5.1.2 block DT-8 allows restoration of drywell temperature below 330°F without requiring a 5.1.1 entry and Emergency Depressurization be performed. (D is correct)

QUESTION # 15 OCTOBER 2009

With Columbia operating at full power, a leak in the suppression pool has resulted in SP level dropping to -8 inches before the leak was isolated. PPM 5.2.1, Primary Containment Control, was entered on low Suppression Pool water level. The CRS directs a report of containment parameters.

Which of the following is correct?

Due to the low Suppression Pool water level, wetwell temperature is read …….

A. at H13-P601 using the digital meter, SMTP-TI-5.

B. at H13-P601 using point A02 on CMS-TR-5 or CMS-TR-6.

C. at H13-P602 using the GDS reading.

D. on computer at CRS desk using PPCRS reading.

ANSWER: B

KA # & KA VALUE: 295030 EA2.02 Ability to determine and/or interpret the following as they apply to Low Suppression Pool Water Level: Suppression Pool temperature (3.9 / 3.9)

REFERENCE: Operator Aid #91-21 and 91-22

SOURCE: New

LO: 6200 State if an operator aid can be used in lieu of an approved plant procedure.

RATING: L3

ATTACHMENT: None

JUSTIFICATION: When Suppression Pool water level drops to –6 inches, operator aids inform the operator to use point AO2 on CMS-TR-5 (6) because the temperature element has been exposed (not covered in water) (B is correct).

QUESTION # 16 OCTOBER 2009

Which of the following conditions would assure adequate core cooling?

A. ATWS exists, RPV pressure at 600 psig, one Reactor Feedwater Pump maintaining RPV level at –200 inches.

B. Reactor is shutdown, RPV pressure 850 psig, HPCS maintaining RPV level and injecting at 7000 gpm with RPV level at –220 inches.

C. ATWS exists, RPV Pressure at 500 psig, Condensate Booster Pumps maintaining RPV level at –178 inches.

D. Reactor is shutdown, No sources of injection are available, RPV pressure at 800 psig, RPV Level at –210 inches.

ANSWER: C

KA # & KA VALUE: 295031 EK1.01 Knowledge of the operational implications of the following as they apply to Reactor Low Water Level: Adequate Core Cooling (4.6 / 4.7)

REFERENCE: PPM 5.0.10 page 17

SOURCE: New

LO: 8041 List the four methods used to provide adequate core cooling in the EOPs.

RATING: H2

ATTACHMENT: None

JUSTIFICATION: A is incorrect because RPV level is LT –183 inches; B is incorrect because RPV level is LT –210 inches; D is incorrect because RPV level is LT –201 inches; C is correct

QUESTION # 17 OCTOBER 2009

During an ATWS condition with reactor power greater than 5% or unknown, direction is given to lower reactor water level to below -65 inches.

Which of the following describes the reason for reducing reactor level to at least -65 inches?

Feedwater heating in the steam space .....

A. reduces core inlet subcooling and stabilizes reactor power oscillations.

B. reduces core inlet subcooling and reduces core void production.

C. increases core inlet subcooling and increases core void production.

D. increases core inlet subcooling and stabilizes reactor power oscillations.

ANSWER: A

KA # & KA VALUE: 295037 EK3.03 Knowledge of the reason for the following as they apply to Scram Condition Present and Reactor Power Above APRM Downscale or Unknown: Lowering reactor water level (4.1 / 4.5)

REFERENCE: PPM 5.0.10 page 149

SOURCE: Bank (slightly modified) – LO00165

LO: 8149 Given a list, identify the statement that describes the purpose of intentionally lowering RPV water level during an ATWS

RATING: L2

ATTACHMENT: None

JUSTIFICATION: B is incorrect because reduced inlet subcooling increases core void production. C is incorrect because an increase in core inlet subcooling decreases void production. D is incorrect because on increase in core inlet subcooling causes reactor power oscillations to increase.

QUESTION # 18 OCTOBER 2009

PPM 5.4.1, Radioactivity Release Control directs that “If turbine building HVAC system is shutdown, then restart turbine building HVAC”.

Which of the following is the basis for this action?

A. Results in the radioactivity being discharged as a ground level release to limit the dispersion of the radioactivity.

B. Results in positive pressure inside the turbine building to limit the intrusion of radioactivity from the reactor building.

C. Provides for recirculation of the turbine building atmosphere with a reduction in the amount of radioactivity released.

D. Assures that any radioactivity in the turbine building is discharged through an elevated and monitored release point.

ANSWER: D

KA # & KA VALUE:	295038EK2.03 Knowledge of the interrelationship between High Off-Site Release Rate and the following: Plant Ventilation Systems (3.6 / 3.8)
REFERENCE:	PPM 5.0.10 page 318
SOURCE:	Bank (Modified) LO00213
LO:	8477 Identify the purpose of restarting Turbine and Radwaste Building HVAC during attempts to control offsite radioactivity release rates above the Alert level
RATING:	L2
ATTACHMENT:	None
JUSTIFICATION:	A is incorrect because the Turbine Building discharge is elevated and not at ground level. B and C are incorrect because Turbine Building ventilation takes a suction from the Turbine Building, maintaining it at a slightly negative pressure and discharges at an elevate discharge, without recurring Turbine Building air or a positive pressure in the Turbine Building. D is correct.

QUESTION # 19 OCTOBER 2009

A fire in H13-P601 in the Control Room has forced the crew to evacuate the Control Room. The crew had time to only perform the immediate actions of ABN-CR-EVAC. The Remote Shutdown and Alternate Remote Shutdown Panels have been activated.

Which of the following is not affected by the fire in the Control Room?

A. RCIC

B. RHR A

C. RHR B

D. SW A

ANSWER: C

KA # & KA VALUE: 600000 AA2.17 Ability to determine and interpret the following as they apply to Plant Fire On Site: Systems that may be affected by the fire (3.1 / 3.6)

REFERENCE: ABN-CR-EVAC Pages 15, 34, 38 and 40

SOURCE: New

LO: 11619 Describe the physical connection and/or cause effect relationship between RSD and the RHR; SW and RCIC Systems

RATING: L3

ATTACHMENT: None

JUSTIFICATION: Per ABN-CR-EVAC, the RCIC, Service Water A and the RHR-A systems are not fire protected and may become inoperable (A, B and D are incorrect). RHR-B is a fire protected system (C is correct).

QUESTION # 20 OCTOBER 2009

With Columbia operating at rated power an unanticipated loss of the Backup Transformer occurs.

Which of the following procedures should be entered and also describes the reason the required action is to be performed?

A. ABN-ELEC-GRID and protect the on-site power sources and vital buses which will maximize the reliability of those on-site power sources.

B. ABN-TR-B-LOSS and place the control switches for the B-7 and B-8 breakers to the “PTL” position. This ensures that the realignment of power will be performed in a controlled fashion.

C. ABN-ELEC-LOOP and verify operability of DG-1 and DG-2 which will ensure these on-site power sources are available if needed.

D. ABN-ELEC-115KV and request BPA restore power to TR-B as soon as possible which limits the time Columbia would be vulnerable of a plant trip without this offsite power source available.

ANSWER: A

KA # & KA VALUE: 700000 AK3.02 Knowledge of the reasons for the following responses as they apply to Generator Voltage and Electric Grid Disturbances: Actions contained in abnormal operating procedures for voltage and grid disturbances (3.6 / 3.9)

REFERENCE: ABN-ELEC-GRID Pages 2 and 5 and Bases page 9

SOURCE: New

LO: 12153 Given annunciators and indications evaluate for entry into ABN-ELEC-GRID

RATING: L2

ATTACHMENT: None

JUSTIFICATION: Per ABN-ELEC-GRID entry is made to it and on-site power sources are protected which will maximize the reliability of those on-site power sources (A is correct).

QUESTION # 21 OCTOBER 2009

With Columbia operating at full power, a leak develops in the Main Condenser that is greater than the capacity of the Off Gas System. Before any actions can be performed, a Reactor Scram occurs.

Which of the following is correct concerning the Reactor Scram?

The Reactor scrammed due to…….

A. Low Reactor Water Level caused by the trip of the Reactor Feedwater Pumps.

B. Governor Valve Fast Closure caused by the trip of the Main Turbine.

C. MSIV Closure caused when the MSIVs closed on high back pressure.

D. RPV High Pressure caused by the closure of the MSIVs with BPVs closed.

ANSWER: B

KA # & KA VALUE: 295002 AA1.03 Ability to operate and/or monitor the following as they apply to Loss of Main Condenser Vacuum: RPS (3.4 / 3.5)

REFERENCE: ABN-BACKPRESSURE Page 2

SOURCE: New

LO: 6788 Given a loss of vacuum, identify the automatic actions that may have occurred.

RATING: H2

ATTACHMENT: None

JUSTIFICATION: The first automatic action that occurs on rising back pressure is the MT trip with GE 835MWe at 8” back pressure (B is correct). MSIV closure is at 21.6” back pressure and BPV closure at 22.9” back pressure (C and D are incorrect). RFW pumps trip at 29.9” back pressure (A is incorrect).

QUESTION # 22 OCTOBER 2009

With A RHR operating in Shutdown Cooling, an event occurred that resulted in the trip of RHR-P-2A.

Which of the following caused the trip of RHR-P-2A?

A. High RPV Pressure of 135 psig

B. Low RPV Level of +18 inches

C. High Drywell Pressure of 2 psig

D. High Containment Temperature of 150°F

ANSWER: A

KA # & KA VALUE: 295007 AK2.05 Knowledge of the interrelationships between High Reactor Pressure and the following: Shutdown Cooling (2.9 / 3.1)

REFERENCE: SD000198 Page 10 and 13

SOURCE: New

LO: 5781 List the interlocks and trips associated with the following RHR system components: A. RHR Pumps D. RHR-V-8/9

RATING: L3

ATTACHMENT: None

JUSTIFICATION: B is incorrect as +13 inches is the setpoint. C and D are incorrect as they are not trips for RHR-P-2A in SDC. A is correct as RHR-P-2A trips on RHR-V-8/9/53A closing which they do if RPV pressure rises to 125 psig.

Events occurred that have resulted in Columbia being in an ATWS with Reactor power at 22%. RFW pumps are maintaining a lowered RPV level at –70 inches. Both Standby Liquid Control pumps were started 10 minutes ago.

Which of the statements is correct concerning cooldown.

Cooldown is……..

A. permitted to be started when all APRMs indicate downscale and would be stopped if any APRM downscale cleared.

B. only permitted when it has been determined that the existing control rod pattern alone can always assure reactor shutdown.

C. not permitted because of the additional energy/heat load that would be imposed on the Primary Containment could lead to Primary Containment failure.

D. not permitted until Cold Shutdown Boron Weight has been injected because core reactivity response for a partially borated core is unpredictable.

ANSWER: D

KA # & KA VALUE:	295015 AK1.02 Knowledge of the operational implications of the following as they apply to Incomplete Scram: Cooldown effects on reactor power (3.9 / 4.1)
REFERENCE:	PPM 5.0.10 page 223
SOURCE:	New
LO:	11145 Given plant conditions determine the correct action to be performed while in PPM 5.1.2 RPV Control - ATWS
RATING:	H2
ATTACHMENT:	None
JUSTIFICATION:	PPM 5.0.10 states the reactivity response of a partially borated core is unpredictable and subsequent steps may not prescribe the correct actions if a return to criticality were to occur - D is correct. A is incorrect because it is not supported in 5.0.10. B is incorrect because cooldown could also be started when CSBW is injected. C is incorrect because with the MSIVs open, 23% power is within the capability of the BPVs thus no additional heat load would be imposed on primary containment.

QUESTION # 24 OCTOBER 2009

PPM 6.3.2 “Fuel Shuffling and/or Offloading and Reloading’, has a caution that states: “If direct communications are lost between the bridge and the Control Room, a bundle shall not be inserted into the core”.

Which if the following is the reason for the stoppage of bundle insertion per this caution?

If communications were lost……..

A. the requirement that permission from the Operator-at-the-Controls be given prior to each ‘change in reactivity’ during refueling would not be met, requiring the ‘change in reactivity’ evolution be stopped.

B. the requirement that during ‘Special Evolutions’ (which a Core Alteration is considered to be), constant communications be established, would not be met requiring Core Alterations be stopped.

C. the Station Nuclear Engineer would not know when the Shutdown Margin check, required during Core Alterations, should be performed.

D. the Control Room would not know when to monitor the core for an inadvertent criticality and then be unable to inform the refuel floor of the event.

ANSWER: D

KA # & KA VALUE:	295014 G 2.1.36 Inadvertent Reactivity Addition. Knowledge of the procedurals and limitations associated with core alterations. (3.0 / 4.1)
REFERENCE:	PPM 6.3.2 page 17
SOURCE:	New
LO:	8830 Discuss what actions are required if communication is lost between the refuel bridge and the control room during fuel shuffling.
RATING:	L2
ATTACHMENT:	None
JUSTIFICATION:	Per references the reason for the requirement of constant communication between refuel floor and the operator-at-the-controls is to ascertain that an inadvertent criticality will not be attained (D is correct).

QUESTION # 25 OCTOBER 2009

Following a major transient, Wetwell and Drywell sprays have been initiated. Suppression Pool water level has just been reported by CRO3 to be 51 feet. EOP 5.2.1, Primary Containment Control, directs that Drywell sprays be terminated.

Which of the following describes the reason for stopping Drywell sprays at this Suppression Pool level?

A. The Drywell spray nozzles become covered and are therefore ineffective in reducing Drywell pressure.

B. The Wetwell/Drywell vacuum breakers become covered and operation of Drywell sprays may cause the Primary Containment differential pressure capability to be exceeded.

C. Operation of Drywell sprays may cause the code stresses to be exceeded on the Downcomers.

D. The Wetwell/Drywell vacuum breakers become covered and operation of Drywell sprays may cause Primary Containment Pressure Limit (PCPL) to be exceeded.

ANSWER: B

KA # & KA VALUE:	295029 EK2.05 Knowledge of the interrelationship between High Suppression Pool Water Level and the following: Containment/Drywell vacuum breakers (3.1 / 3.3)
REFERENCE:	PPM 5.0.10 page 272
SOURCE:	Bank Slightly Modified LO00230
LO:	8313 Given a list, identify the statement that describes the possible result of spraying the drywell when wetwell level is above 51 feet.
RATING:	L3
ATTACHMENT:	None
JUSTIFICATION:	Per reference B is correct.

QUESTION # 26 OCTOBER 2009

Columbia was operating at power when the Reactor Building Exhaust Plenum Rad High alarm annunciates followed quickly by the Reactor Building Exhaust Plenum Rad High High alarm. CRO2 reports REA-RIS-609A, 609B, and 609C all read approximately 14 mrem/hr; and REA-RIS-609D reads approximately 12 mrem/hr.

Which of the following is correct for this event?

A. The running Reactor Building Supply and Exhaust fans trip. Only one Standby Gas Treatment System initiates.

B. Reactor Building Supply and Exhaust fans continue to operate. Standby Gas Treatment does not initiate.

C. The running Reactor Building Supply and Exhaust fans trip. Both Standby Gas Treatment Systems initiate.

D. Reactor Building Supply and Exhaust fans continue to operate. Only one Standby Gas Treatment System initiates.

ANSWER: C

KA # & KA VALUE: 295033 EA1.03 Ability to operate and/or monitor the following as they apply to High Secondary Containment Area Radiation Levels: Secondary Containment Ventilation (3.8 / 3.8)

REFERENCE: 4.602.A5 1-4; Simulator

SOURCE: New

LO: 5679 Describe the RB HVAC system response to the LOCA Isolation signals (FAZ)

RATING: H2

ATTACHMENT: None

JUSTIFICATION: Per reference it takes RIS-609 A and B to trip or RIS-C and D. On system trip, RB fans trip and both trains of SGT start – C is correct.

QUESTION # 27 OCTOBER 2009

Which of the following plant conditions would account for a high EDR-SUMP-R5 sump level?

A. An ATWS exists. The SDV high water level trip is bypassed and the scram is reset. The Scram Discharge Volume vents have just opened.

B. An ATWS exists. The SDV high water level trip is bypassed and the scram is reset. The Scram Discharge Volume drains have just opened.

C. A Reactor scram due to low RPV Water level. RPV Water level is now at –135 inches. A large leak exists on the flange at the discharge of RHR-P-2A.

D. A Reactor scram due to high Drywell Pressure. RRC-P-1A is running at 15 Hz. The outer seal on RRC-P-1A has catastrophically failed.

ANSWER: B

KA # & KA VALUE:	295036 EA2.03 Ability to determine and/or interpret the following as they apply to Secondary Containment High Sump/Area Water Level: Cause of the high water level (3.4 / 3.8)
REFERENCE:	SD000142 Figure 2; SD000130 page 14 & Figure 8 and 13
SOURCE:	New
LO:	5329 List isolation signals and setpoints for b. EDR-V-19 and EDR-V-20;
RATING:	H2
ATTACHMENT:	None
JUSTIFICATION:	A is incorrect as SDV Vents to FDR sump in HPCS Pump Room. C is incorrect as RHR-A drains to FDR Sump R1 in Reactor Building. D is incorrect as containment isolates on High Drywell pressure. B is correct.

QUESTION # 28 OCTOBER 2009

Columbia has experienced a series of events that have left RHR-P-2A injecting 6000 gpm to maintain RPV Level. RPV level is currently –143” and RPV pressure is 100 psig.

If a loss of the Startup Transformer were to occur and the Backup Transformer operated as designed, which of the following describes the effect on the ‘A’ RHR System?

The breaker for RHR-P-2A ……

A. remains closed and RHR-V-42A remains open throughout the event.

B. trips opens on loss of power and must be manually restarted after power is restored. RHR-V-42A remains open.

C. trips open on loss of power and then re-closes after power is restored. RHR-V-42A closes after power is restored and must be manually reopened.

D. trips opens on loss of power and then re-closes after power is restored. RHR-V-42A remains open.

ANSWER: D

KA # & KA VALUE: 203000 K6.01 Knowledge of the effect that a loss or malfunction of the following will have on the RHR/LPCI Injection Mode: A.C. Electrical Power (3.6 / 3.7)

REFERENCE: SD000198 Pages 10 and 18

SOURCE: New

LO: 11813 Describe the effect that a loss or malfunction of the following will have on RHR system: a) AC Electrical power.

RATING: H2

ATTACHMENT: None

JUSTIFICATION: RHR-P-2A breaker opens on undervoltage. When power is restored the breaker will re-close as the initiation signal is still present. RHR-V-42A has no auto close feature and remains open throughout the event – D is correct

QUESTION # 29 OCTOBER 2009

Columbia is shutdown in preparation for a refueling outage. RHR-P-2B is running in Shutdown Cooling.

If RPV Level drops to +9 inches, which of the following is correct?

A. RHR-V-8 and RHR-V-9 go closed. RHR-P-2B trips when either RHR-V-8 or RHR-V-9 starts to close.

B. RHR-V-8 and RHR-V-9 go closed. RHR-P-2B trips after either RHR-V-8 or RHR-V-9 is fully closed.

C. Only RHR-V-8 closes. RHR-P-2B trips when RHR-V-8 starts to close.

D. Only RHR-V-9 closes. RHR-P-2B trips when RHR-V-9 is fully closed.

ANSWER: A

KA # & KA VALUE: 205000 K4.03 Knowledge of Shutdown Cooling System (RHR Shutdown Cooling Mode) design feature(s) and/or interlocks which provide for the following: Low reactor water level (3.8 / 3.8)

REFERENCE: ABN-RHR-SDC-LOSS Page 2

SOURCE: New

LO: 6752 Given entry into ABN-RHR-SDC-LOSS, identify what automatic actions may have occurred.

RATING: L3

ATTACHMENT: None

JUSTIFICATION: Per reference, both RHR-V-8 and RHR-V-9 go closed on low RPV water level C and D are incorrect. When either RHR-V-8 or RHR-V-9 starts to close (not is fully closed), RHR-P-2B trips B is incorrect and A is correct.

QUESTION # 30 OCTOBER 2009

With RPV level at –145 inches, which of the following describes the proper operation of the LPCS system?

If the control switch for LPCS-P-1 is taken to the 'STOP' position……

A. the manual override light illuminates, LPCS-P-1 breaker opens, and LPCS-FCV-11 auto closes.

B. the manual override light illuminates, LPCS-P-1 breaker opens, and LPCS-FCV-11 remains open.

C. the manual override light does not illuminate, LPCS-P-1 breaker opens, and LPCS-FCV-11 remains open.

D. the manual override light does not illuminate, LPCS-P-1 breaker opens, and LPCS-FCV-11 auto closes.

ANSWER: B

KA # & KA VALUE: 209001 Low Pressure Core Spray; 2.2.44 Ability to interpret control room indications to verify status and operation of a system, and understand how operator actions and directives affect plant and system conditions (4.2 / 4.4)

REFERENCE: SD000192 Page 6 and 7

SOURCE: New

LO: 7663 State the LPCS system components that have a manual override circuit and conditions necessary to activate the manual override light. 5484 Describe interlocks for LPCS-FCV-11.

RATING: H2

ATTACHMENT: None

JUSTIFICATION: An initiation signal present and LPCS-P-1 C/S to off illuminates the override light (C and D incorrect). When the LPCS-P-1 pump stops, LPCS-FCV-11 has to be manually closed (A is incorrect). B is correct.

QUESTION # 31 OCTOBER 2009

Columbia was operating at power when a small leak on a recirc loop caused an automatic Reactor Scram. All systems operated as designed. A short time later, CRO2 acknowledges a ‘SUPP POOL LEVEL HIGH/LOW’ alarm. Suppression pool level is checked and is currently +0.9” and going up slowly.

Based on the above, which of the following systems could account for this rise in Suppression Pool water level?

A. Reactor Core Isolation Cooling System

B. Low Pressure Core Spray System

C. The ‘A’ Residual Heat Removal System

D. High Pressure Core Spray System

ANSWER: D

KA # & KA VALUE:	209002 A1.05 Ability to predict and/or monitor changes in parameters associated with the High Pressure Core Spray System controls including: Suppression Pool Water Level. (3.3 / 3.4)
REFERENCE:	SD000174 page 6
SOURCE:	New
LO:	11721 Describe the cause/effect relationship between HPCS and the Supp. Pool
RATING:	H2
ATTACHMENT:	None
JUSTIFICATION:	Stem indicates Reactor scram on 1.68 psig DW Pressure. RCIC does have min flow from CST to SP but does not initiate on that signal (A is incorrect). LPCS and RHR do not take suction on CST (B and C are incorrect). HPCS initiates on a 1.68 psig DW/P signal and takes a suction on CST and min flow goes to Supp. Pool (D is correct).

QUESTION # 32 OCTOBER 2009

The plant is operating at rated power when HPCS annunciator P601.A1 4-8 'SPRAY HEAD TO TOP OF CORE PLATE ΔP HIGH" annunciates.

Which of the following is correct concerning this condition?

The Standby Liquid Control system…..

A. will inject directly into the core under all conditions.

B. may not be able to be directly injected into the core if needed.

C. will only inject if the High Pressure Core Spray system is running.

D. will only inject if the High Pressure Core Spray pump (HPCS-P-1) is not running.

ANSWER: B

KA # & KA VALUE: 211000 K1.09 Knowledge of the physical connection and/or cause effect relationship between Standby Liquid Control and the following: Core Spray System (3.2 / 3.4)

REFERENCE: 4.P601.A1 4-8 ARP; SD000172 page 15

SOURCE: Bank slightly modified – LO01243

LO: 5922 Describe the SLC flowpaths: Normal Injection. 11722 Describe the effects that a loss or malfunction of the HPCS system will have on the following: b. SLC system

RATING: H2

ATTACHMENT: None

JUSTIFICATION: The annunciator referenced indicates a break in the HPCS injection line between the reactor vessel wall and the core shroud. This failure would not allow SLC or HPCS to inject into the core area. B is correct.

QUESTION # 33 OCTOBER 2009

A Reactor scram occurred, the problem corrected, and the scram has been reset.

CRO1 notes the following SDV SYSTEM indications on H13-P603:

HEADER VENT CRD-V-10/CRD-V-180 – both the green and red lights are illuminated
HEADER DRAIN CRD-V-11/CRD-V-181 – the green light is illuminated, the red light is not illuminated

Which of the following explains this indication?

A. One header vent valve is fully opened, the other is in an intermediate position;
One header drain valve is closed, the other is in an intermediate position.

B. One header vent valve is fully opened, the other is fully closed;
Both header drain valves are fully closed.

C. One header vent valve is fully closed, the other is in an intermediate position;
One header drain valve is closed, the other is in an intermediate position.

D. One header vent valve is fully closed, the other is in an intermediate position;
Both header drain valves are fully closed.

ANSWER: A

KA # & KA VALUE: 212000 A4.12 Ability to manually operate and/or monitor in the control room: Close/open SCRAM instrument volume vent and/or drain valves (3.9 / 3.9)

REFERENCE: SD000142 pages 17 and 18

SOURCE: New

LO: 5188 Describe the sequence of events that occur to the SDV vent and drain valves during scram, scram reset, and valve testing.

RATING: L2

ATTACHMENT: None

JUSTIFICATION: A is correct. B, C and D are incorrect because if one vent was fully closed the red light would not be lit. The Drain valve indication could be one closed one intermediate of both closed.

QUESTION # 34 OCTOBER 2009

With a plant startup in progress, CRO1 has just taken the Mode switch to RUN. The CRS directs all IRMs be withdrawn. As the IRMs are being withdrawn, a loss of power from the ±24 VDC power supply, DP-SO-1A, to IRM 'C' occurs.

Which of the following identifies the effects on the IRM system due to this loss of power?

A. No alarms annunciate on H13-P603. The 'DOWNSCALE' light illuminates on IRM 'C' drawer on H13-P606.

B. The 'DOWNSCALE' light illuminates on IRM 'C' drawer on H13-P606 and the 'IRM MONITOR DOWNSCALE' alarm annunciates on H13-P603.

C. The 'IRM MONITOR DOWNSCALE' alarm and the 'IRM ACEG UPSCL TRIP OR INOP' alarm annunciate on H13-P603.

D. The 'DOWNSCALE' light illuminates on IRM 'C' drawer on H13-P606 and the detector drive motor for IRM 'C' will lose power.

ANSWER: A

KA # & KA VALUE:	215003 K6.02 Knowledge of the effect that a loss or malfunction of the following will have on the Intermediate Range Monitor system: 24/48 volt DC power (3.6 / 3.8)
REFERENCE:	SD000138 pages 14, 15 and 16
SOURCE:	New
LO:	5449 Describe the cause and effect relationship between the IRM INOP condition and the following: High Voltage power supply 5459 List the IRM scrams and rod blocks with setpoints and bypass conditions
RATING:	L3
ATTACHMENT:	None
JUSTIFICATION:	All IRMs are withdrawn after the Mode switch is taken to RUN. A loss of power from ± 24VDC for IRM 'C' results in an Downscale light on panel H13-P606 but no alarm in H13-P603 annunciates (A is correct, B and C are incorrect) The detector drive power supply is PP-8C-A-A (D is incorrect)

Columbia is starting up with CRO1 continuing to pull rods to achieve criticality. During the performance of a surveillance the Mode switch for SRM 'A', on H13-P606, is mistakenly moved out of 'OPERATE' and placed in the 'STANDBY' position.

Which of the following alarm response procedures should be referenced due to the above?

A. 4.603.A7 6-5 SRM MONITORS UPSCL OR INOP and 4.603.A7 3-4 ½ SCRAM SYSTEM A

B. 4.603.A7 6-6 SRM MONITOR DOWNSCALE and 4.603.A7 3-4 ½ SCRAM SYSTEM A

C. 4.603.A7 2-7 ROD OUT BLOCK and 4.603.A7 6-5 SRM MONITORS UPSCL OR INOP

D. 4.603.A7 2-7 ROD OUT BLOCK and 4.603.A7 6-6 SRM MONITOR DOWNSCALE

ANSWER: C

KA # & KA VALUE:	215004 A2.02 Ability to (a) predict the impacts of the following on the Source Range Monitor System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: SRM Inop condition (3.4 / 3.7)
REFERENCE:	SD000132 Page 22, 4.603.A7 1-2, 6-5
SOURCE:	Bank Modified LO01152
LO:	12005 Predict the impact of the following on the Source Range Monitoring System: SRM Inop condition
RATING:	H3
ATTACHMENT:	None
JUSTIFICATION:	Per reference, when Mode switch is in STANDBY it gives an SRM Inop Trip (B and D are incorrect) and a rod block if SRM not bypassed and power is LT IRM range 8 (C is correct). SRM inop does not give ½ scram (A is incorrect)

QUESTION # 36 OCTOBER 2009

Which of the following describes the number of APRM channels required to generate a trip signal to cause a full scram signal?

A. Any 1 signal out of the 2 possible signals taken twice.

B. Any 1 signal out of the 3 possible signals taken twice.

C. Any 2 signals out of the 3 possible signals taken twice.

D. Any 2 signals out of the 6 possible signals taken once.

ANSWER: B

KA # & KA VALUE: 215005 K4.02 Knowledge of the Average Power Range Monitor System design feature(s) and/or interlocks which provide for the following: Reactor Scram signals (4.1 / 4.2)

REFERENCE: SD000149 Page 19

SOURCE: New

LO: 5095 Describe the physical connections and/or cause-effect relationships between APRM system and the following: a. RPS

RATING: L2

ATTACHMENT: None

JUSTIFICATION: RPS requires a 1 out of 3 taken twice logic to be satisfied for an APRM scram signal to be generated. (B is correct)

QUESTION # 37 OCTOBER 2009

Which of the following explains the operation of the RCIC system when it automatically shifts pump suctions from the Condensate Storage Tanks to the Suppression Pool on low CST Level?

A. RCIC-V-10 (CST Suction) starts to stroke closed causing RCIC-V-31 (SP Suction) to stroke open.

B. RCIC-V-10 (CST Suction) strokes full closed which then causes RCIC-V-31 (SP Suction) to stroke open.

C. RCIC-V-31 (SP Suction) starts to stroke open causing RCIC-V-10 (CST Suction) to stroke closed.

D. RCIC-V-31 (SP Suction) strokes full open which then causes RCIC-V-10 (CST Suction) to stroke closed.

ANSWER: D

KA # & KA VALUE: 217000 A3.01 Ability to monitor automatic operation of the Reactor Core Isolation Cooling System including: Valve Operation (3.5 / 3.5)

REFERENCE: SD000180 Pages 10 and 17, and the Simulator

SOURCE: New

LO: 5724 Explain the interlocks associated with d. RCIC-V-10 and RCIC-V-31

RATING: L3

ATTACHMENT: None

JUSTIFICATION: RCIC-V- 31 strokes opens on low CST level. RCIC-V-10 closes when RCIC-V-31 is full open. D is correct

QUESTION # 38 OCTOBER 2009

During operation at power, CRO2 acknowledges the "ADS DIV 2 OUT OF SERVICE" annunciator (4.P601.A2 6-8) and refers to the Alarm Response Procedure.

If this alarm is associated with a loss of ADS B/D Logic Power Failure, which electrical panel should the Equipment Operator be dispatched to investigate?

A. DP-S2-1A

B. DP-S1-2A

C. DP-S2-1D

D. DP-S1-2D

ANSWER: B

KA # & KA VALUE: 218000 K2.01 Knowledge of the electrical power supply to the following: ADS Logic (3.1 / 3.3)

REFERENCE: SD000186 page 8

SOURCE: New

LO: 5077 List the power supplies to the ADS valve solenoids

RATING: L3

ATTACHMENT: None

JUSTIFICATION: Per reference, ADS "B" Logic is powered from DP-S1-2A. B is correct

QUESTION # 39 OCTOBER 2009

With Columbia shutdown in Mode 4, RHR has been secured from Shutdown Cooling. A planned surveillance on a loss of RPS-B is being conducted which requires transferring RPS-B power supply from the Alternate to the Normal feed. After completion of the surveillance, the 'half scram' was reset but the NSSS Isolation Logic was not reset.

RPS-A power supply was then transferred from the Normal to the Alternate feed as part of a planned power supply transfer.

Which of the following explains the effect of this power supply transfer on the plant?

A. Only the inboard MSIVs close.

B. Only the outboard MSIVs close.

C. All MSIVs close.

D. All MSIVs remain open.

ANSWER: C

KA # & KA VALUE: 223002 A1.02 Ability to predict and/or monitor changes in parameters associated with operating the Primary Containment Isolation System/Nuclear Steam Supply Shut-Off control including: Valve Closure (3.7 / 3.7)

REFERENCE: SD000173 Page 9

SOURCE: New

LO: 5596 Describe the isolation logic used by the NS4 system for MSIV isolation and Group 3 & 4

RATING: H3

ATTACHMENT: None

JUSTIFICATION: Not resetting the MSIV logic for 'B' and 'D' and then de-energizing the logic for 'A' and 'C' causes a full MSIV isolation. C is correct

QUESTION # 40 OCTOBER 2009

During operation at full power an SRV spuriously opens.

Which of the following describes the immediate effect this will have on:

Reactor pressure; Reactor water level; Indicated steam flow?

A. Remains the same; Decreases, Increases

B. Remains the same; Increases; Decreases

C. Decreases; Decreases; Decreases

D. Decreases; Increases; Increases

ANSWER: C

KA # & KA VALUE: 239002 A3.07 Ability to monitor automatic operation of the Relief/Safety Valves including: Reactor Water Level (3.8 / 3.9)

REFERENCE: Simulator

SOURCE: New

LO: 11697 Predict the impact on the following with a SRV open: Reactor Pressure, Water level, power

RATING: H2

ATTACHMENT: None

JUSTIFICATION: Spurious opening of an SRV at power causes Pressure to decrease, Water Level to decrease, and Indicated steam flow to decrease. C is correct.

QUESTION # 41 OCTOBER 2009

The Reactor Vessel Level Control Channel switch on H13-P603 is selected to 'CH B' and the Reactor Vessel Level Control Mode switch is selected to '3 element'.

If RFW-DPT-4B ('B' RPV Narrow Range) fails, which of the following explains the FWLC systems response?

A. The FWLC Programmable Logic Controller automatically selects RFW-DPT-4A. RPV Level control remains in 3 element control.

B. The FWLC Programmable Logic Controller automatically selects RFW-DPT-4A. RPV Level control swaps to single element control until the Reactor Vessel Level Control Channel switch is selected to 'CH A'.

C. The FWLC Programmable Logic Controller automatically selects RFW-DPT-4C. RPV Level control remains in 3 element control.

D. The FWLC Programmable Logic Controller automatically selects RFW-DPT-4C. RPV Level control swaps to single element control until the Reactor Vessel Level Control Channel switch is selected to 'CH C'.

ANSWER: A

KA # & KA VALUE: 259002 K4.14 Knowledge of the Reactor Water Level Control System design feature(s) and/or interlocks which provide for the following: Selection of various instruments to provide reactor water level input (3.4 / 3.4)

REFERENCE: SD000157 Page 4 and 6

SOURCE: New

LO: 11701 Describe the FWLC design feature which provide for the following: f. Selection of various instruments to provide reactor water level input

RATING: H3

ATTACHMENT: None

JUSTIFICATION: CRO may only select Channels A or B – D is incorrect; RFW-DPT-4C is only selected when BOTH A and B have problems – C is incorrect. A failure of the B channel makes PLC select CH A and is not a transfer to single element control – B is incorrect and A is correct.

QUESTION # 42 OCTOBER 2009

Columbia is performing a plant start up with Primary Containment inerting in progress. The “A” Standby Gas Treatment (SGT) train is running and is aligned to take a suction on only the Primary Containment. The oxygen content of containment is currently 18% and trending down. A malfunction in the SGT initiation logic causes a Level 2 initiation signal to be generated. The “A” SGT train responds as designed.

Based on this malfunction, what is the resultant effect on the oxygen concentration in Primary Containment?

Primary Containments oxygen concentration will….

A. go up due to the increased flow from SGT cycling the Reactor Building to Wetwell vacuum breakers.

B. continue to go down but at a slower rate because SGT-V-2A (Reactor Building suction valve) opened.

C. continue to go down but at a faster rate due to the resulting automatic rise in SGT system flow.

D. continue to go down but at a slower rate because SGT-V-1A (Primary Containment suction valve) closed.

ANSWER: D

KA # & KA VALUE: 261000 K3.06 Knowledge of the effect that a loss or malfunction of the Standby Gas Treatment System will have on the following: Primary Containment oxygen content (3.0 / 3.3)

REFERENCE: SD000144 Page 6

SOURCE: Bank slightly modified LO01185

LO: 5828 State the SGT response to an FAZ signal. Include all major valves, heaters, and fans and their associated delay times

RATING: H3

ATTACHMENT: None

JUSTIFICATION: On an initiation signal SGT-V-1A automatically closes, isolating containment (A, B, and C are incorrect and D is correct)

QUESTION # 43 OCTOBER 2009

Due to a series of events SM-7 has become de-energized.

Which of the following facilities would be required to relocate due to this loss of power?

A. Technical Support Center (TSC)

B. Emergency Operating Facility (EOF)

C. Main Control Room (MCR)

D. Operational Support Center (OSC)

ANSWER: A

KA # & KA VALUE: 262001 AC Distribution System 2.4.42 Knowledge of Emergency Response Facilities (2.6 / 3.8)

REFERENCE: Drawing E970; PPM 13.10.2 Page 23

SOURCE: New

LO: None

RATING: L3

ATTACHMENT: None

JUSTIFICATION: A loss of power to MC-7-A-B causes a loss of power to TSC lighting, computer power, and power panels. OSC power is from MC-5A. RWCR power is from MC-8A-2C. MCR has multiple power supplies. A is correct

QUESTION # 44 OCTOBER 2009

A loss of IN-2A or IN-2B, coincident with a failure of the static switch to auto transfer, would cause which of the following?

A. Loss of the RPIS power supply

B. Closure of the Inboard MSIVs

C. RCC-P-1A trips if it were running

D. All feedwater heater controllers lose power

ANSWER: B

KA # & KA VALUE:	262002 K3.11 Knowledge of the effect that a loss or malfunction of the Uninterruptable Power Supply (AC/DC) will have on the following: MSIVs (2.8 / 2.9)
REFERENCE:	ABN-ELEC-INV Pages 2, 3 and 4
SOURCE:	New
LO:	7783 Predict the effects a failure of IN-2 will have on: a. MSIVs
RATING:	L3
ATTACHMENT:	None
JUSTIFICATION:	A loss of IN-3A/3B causes a loss of RPIS and RCC-P-1A to trip if it were running (A and C are incorrect). A loss of IN-1 causes FW heaters controllers to lose power (D is incorrect) B is correct as Inboard MSIVs close on IN-2A/2B loss.

QUESTION # 45 OCTOBER 2009

A ground alarm is received on 125 VDC Battery B1-7 (4.800.C5 6-7 125VDC BATT B1-7 GND). The Control Room Operator checks the Bus S1-7 Ground Detection Meter which indicates 5KΩ (ohms).

Which of the following is correct?

This meter reading indicates that….

A. there is a ground and that the ground is severe.

B. there is a ground but that the ground is not severe.

C. the Ground Detector Test Switch has been placed in the POS (positive) position.

D. the Ground Detector Test Switch has been placed in the NEG (negative) position.

ANSWER: A

KA # & KA VALUE: 263000 A3.01 Ability to monitor automatic operation of the D.C. Electrical Distribution including: Meters, dials, recorders, alarms, and indicating lights (3.3 / 3.5)

REFERENCE: 4.800.C5 6-7; SD000188 pages 11 and 12

SOURCE: New

LO: 5261 Describe how the 125VDC and 250 VDC ground detectors indicate the severity and polarity of a DC system ground

RATING: L2

ATTACHMENT: None

JUSTIFICATION: Per the ARP if meter indicates more that 25K ohms – ground is not severe (B is incorrect). The Ground Detector Test Switch places a 10K ohm ground in (C and D are incorrect) A is correct

QUESTION # 46 OCTOBER 2009

Columbia is in a refueling outage with the Backup Transformer powering SM-7 and SM-8. A DG-2 surveillance is in progress with DG-2 synchronized with SM-8. A fault on breaker B-7 occurs that causes an undervoltage on SM-7. Breaker B-7 does not trip open. In response, DG-1 automatically starts but the output breaker, DG1-7, does not close.

Which of the following is correct for this situation?

A. The output breaker for DG-1 did not close because breaker 7-DG1 is open.

B. The output breaker for DG-1 is interlocked from closing in on SM-7.

C. The undervoltage on SM-7 cleared prior to the output breaker for DG-1 closing in.

D. The output breaker should have closed in. Declare DG-1 INOP and refer to Tech Specs.

ANSWER: B

KA # & KA VALUE: 264000 K5.05 Knowledge of the operational implications of the concepts as they apply to Emergency Generators: Paralleling A.C. power sources (3.4 / 3.4)

REFERENCE: SD000182 Page 32 and 63

SOURCE: New

LO: 5050 Describe the cause-and-effect relationship for b. breakers DG1-7, B-7, B-8, and DG2/8

RATING: H3

ATTACHMENT: None

JUSTIFICATION: With the backup transformer supplying both SM-7 and SM-8 and DG2-8 also closed, DG1-7 breaker is interlocked so it will not close - B is correct. A is incorrect as DG1-7 will close with 7-DG1 open.

QUESTION # 47 OCTOBER 2009

Columbia experiences a LOCA coincident with a loss of all offsite power. After the initial response, CRO2 is tasked with restoring the CAS system to operation.

Which of the following is correct?

To return CAS system to operation, OPS3 has to…..

A. only reset the trips on CAS-C-1A and CAS-C-1B.

B. connect firewater to the CJW system and then reset the trips on CAS-C-1A and CAS-C-1B.

C. connect firewater to the CJW Heat Exchangers and then reset the trips on CAS-C-1A and CAS-C-1B.

D. connect firewater to the CJW system and to the CJW Heat Exchangers and then reset the trips on CAS-C-1A and CAS-C-1B.

ANSWER: C

KA # & KA VALUE: 300000 K1.04 Knowledge of the connections and/or cause effect relationship between Instrument Air System and the following: Cooling water to the compressor (2.8 / 2.9)

REFERENCE: SD000205 page 20 and 21

SOURCE: New

LO: 7606 Describe the effect on CAS from the following events: loss of TSW and loss of offsite power.

RATING: H2

ATTACHMENT: None

JUSTIFICATION: CJW pump is powered from MC-8A and would be available when SM-8 is powered from DG2 so firewater does not have to be placed on CJW system (B and D are incorrect). TSW pumps lose power as 7-75/1 and 8-85/1 trip on LOCA and loss of offsite power (A is incorrect). C is correct as firewater does have to be placed on CJW Heat Exchangers and the compressors need to be reset. C is correct

QUESTION # 48 OCTOBER 2009

If an equipment operator is tagging the breaker for the 'A' Plant Service Water Pump open, which of the following load centers would he go to?

A. SL-71

B. SM-75

C. SL-73

D. SM-72

ANSWER: B

KA # & KA VALUE: 400000 K2.01 Knowledge of the electrical power supplies to the following: CCW Pumps (2.9 / 3.0)

REFERENCE: SD000199 page 17

SOURCE: New

LO: 5853 List the power supplies for each of the following: a. TSW-P-1A

RATING: L2

ATTACHMENT: None

JUSTIFICATION: The breaker for the pump is on SM-75 – B is correct.

QUESTION # 49 OCTOBER 2009

The Control Room Operator is in the process of transferring SM-3 from the normal power supply to the startup transformer. When the control switch for CB-S3 is taken to the closed position, the blue "SYNC PERMIT" light momentarily illuminates.

Which of the following explains the meaning of this light?

The blue "Sync Permit" light indicates…..

A. the breaker control switch is in the CLOSE or NORM AFTER CLOSE position and all breaker permissives are met.

B. the breaker control switch is in the CLOSE position and the two bus feeders (Main Generator and Startup Transformer) are in phase.

C. the sync selector switch in the MANUAL or MANUAL CHECK position and the two bus feeders (Main Generator and Startup Transformer) are in phase.

D. the breaker control switch is in the CLOSE position with its sync selector switch in the MANUAL or MANUAL CHECK position and all breaker closure permissives are met.

ANSWER: D

KA # & KA VALUE: 262001 K5.02 Knowledge of the operational implications of the following concepts as they apply to A.C. Electrical Distribution: Breaker Control (2.6 / 2.9)

REFERENCE: SD000182 page 52

SOURCE: New

LO: 5061 State the conditions that exist when the blue sync permit light is on.

RATING: L3

ATTACHMENT: None

JUSTIFICATION: Per reference D is correct

QUESTION # 50 OCTOBER 2009

With Columbia in a refuel outage, RHR ‘A’ system is in Shutdown Cooling (SDC). RPV temperature is approaching 140°F. The CRS directs CRO2 to reduce RPV temperature to 110°F.

Which of the following valves would CRO2 manipulate to reduce RPV temperature?

A. RHR-V-3A (Heat Exchanger Outlet valve) and RHR-V-48A (Heat Exchanger Bypass valve)

B. RHR-V-3A (Heat Exchanger Outlet valve) and RHR-V-53A (Shutdown Cooling Return valve)

C. RHR-V-48A (Heat Exchanger Bypass valve) and RHR-V-53A (Shutdown Cooling Return valve)

D. RHR-V-48A (Heat Exchanger Bypass valve) and RHR-V-68A (RHR Heat Exchanger Service Water Outlet valve)

ANSWER: A

KA # & KA VALUE: 205000 A4.04 Ability to manually operate and/or monitor in the control room: Heat Exchanger cooling water valves (3.4 / 3.3)

REFERENCE: SOP-RHR-SDC Page 16 step 5.1.32

SOURCE: New

LO: 11801 Describe the function, purpose and design features of the following RHR components: e RHR-V-3A/3B; p RHR-V-48A/48B

RATING: H2

ATTACHMENT: None

JUSTIFICATION: RHR-V-3A and RHR-V-48A are the valves used to maintain RPV temperature in SDC. A is correct.

QUESTION # 51 OCTOBER 2009

With Columbia operating at rated power a series of events occur that prompted the CRS to direct a manual scram. The following plant conditions exist as a result of the events:

SGT A and SGT B Trains are running
RPV Pressure control is by MT Bypass Valves
RCC-P-1A and RCC-P-1B are running

Which of the following explains the above system configurations and what procedure would be entered to mitigate the consequences of the condition?

A. RPV Pressure rising to 1100 psig; Enter PPM 5.1.1, RPV Control.

B. RPV Water Level dropping to –55 inches. Enter PPM 5.1.1, RPV Control.

C. Drywell Pressure rising to 8 psig; Enter PPM 5.1.1, RPV Control & PPM 5.2.1, Primary Containment Control.

D. RBHV Exhaust Plenum Radiation Level rising to 15 mr/hr; Enter PPM 5.3.1, Secondary Containment Control.

ANSWER: D

KA # & KA VALUE: 261000 A2.13 Ability to predict the impacts of the following on the Standby Gas Treatment System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High secondary containment ventillation exhaust radiation (3.4 / 3.7)

REFERENCE: SD000173 Page 7, 8, 9

SOURCE: New

LO: 5828 State the SGT system response to a FAZ signal.; 5597 Given the NS4 number list the isolation signals and setpoints

RATING: H3

ATTACHMENT: None

JUSTIFICATION: RPV/P @ 1100# would not cause SGT to initiate (A is incorrect); RPV/L drop to –50” causes MSIV isolation - MT BPVs are controlling pressure (B is incorrect); DW/P @ 8 # causes RCC pumps to trip. RCC pumps are running (C is incorrect); High RBHV Exhaust Plenum rad at GT 13mr/hr causes SGT to initiate and leaves MSIVs open and RCC pumps running (D is correct)

QUESTION # 52 OCTOBER 2009

Columbia is operating at rated power and rated core flow when APRM Flow Unit "A" output fails downscale.

Which of the following responses will occur under the above conditions?

A. When the flow unit output drops below 5% of scale, the APRM auctioneer circuits will transfer the input to the companion flow unit. No rod blocks or scram signals are generated.

B. When the flow unit fails downscale, its signal is selected instead of the companion flow signal, resulting in an APRM rod block and half scram.

C. The flow unit failed downscale will cause the reference total flow signal to drop by 50% because it is averaged with the signal from its companion flow unit. This results in an APRM rod block.

D. When the difference between the two flow unit inputs exceeds 10%, a half scram will be generated until the failed flow unit is bypassed on H13-P603.

ANSWER: B

KA # & KA VALUE:	215005 K6.07 Knowledge of the effect that a loss or malfunction of the following will have on the APRM/LPRM System: Flow converter/comparator network: Plant specific (3.2 / 3.3)
REFERENCE:	SD000149 Page 8 and 26
SOURCE:	Bank Modified slightly LX00547
LO:	7758 Predict the effect(s) that a failure of the following will have on the APRM System c. APRM Flow unit
RATING:	H3
ATTACHMENT:	None
JUSTIFICATION:	APRM upscale trip or INOP results in Rod Withdraw Block and Half SCRAM.

QUESTION # 53 OCTOBER 2009

Which of the following is correct concerning the transfer of US-PP power supplies from the Bypass Source to the Normal UPS Source?

Power is being transferred from…

A. MC-7F to IN-1 and is a break-before-make transfer using the Kirk Key Interlock.

B. MC-7F to IN-1 and is a make-before-brake transfer using the Kirk Key Interlock.

C. MC-7A to IN-1 and is a break-before-make transfer using the Kirk Key interlock.

D. MC-7A to IN-1 and is a make-before-brake transfer using the Kirk Key interlock.

ANSWER: C

KA # & KA VALUE: 262002 A4.01 Ability to manually operate and/or monitor in the control room: Transfer from alternative source to preferred source (2.8 / 3.1)

REFERENCE: SD000194 Page 3, 4 and Figure 3

SOURCE: New

LO: 5896 List the power supplies to each inverters a. IN-1. 5890 State the purpose of the IN-1 Kirk Key Interlock

RATING: L3

ATTACHMENT: None

JUSTIFICATION: US-PP's bypass source is from MC-7A (A and B are incorrect). The Kirk Key interlock is a break before make transfer (D is incorrect). C is correct

QUESTION # 54 OCTOBER 2009

With Columbia operating at rated power and RWCU-P-1B running, the only on-line RWCU filter demineralizer's inlet and outlet valves, RWCU-V-232A and RWCU-V-231A, close due to a loss of air pressure.

Which of the following describes the immediate effect of these valves closing?

A. RWCU-P-1B trips. Both RWCU-V-1 and RWCU-V-4 remain open.

B. RWCU-P-1B trips. RWCU-V-1 remains open and RWCU-V-4 closes.

C. The RWCU pump continues to operate. RWCU-V-44 Filter Demineralizer Bypass Valve fully opens on low RWCU System flow.

D. The RWCU pump continues to operate. RWCU-V-44 Filter Demineralizer Bypass Valve modulates opens on low RWCU System flow.

ANSWER: A

KA # & KA VALUE: 204000 A3.04 Ability to monitor automatic operation of the Reactor Water Cleanup System including: Response to interlocks and trips designed to protect system components (3.4 / 3.5)

REFERENCE: SD000190 Page 8, 9, 10

SOURCE: New

LO: 5037 List the conditions and associated setpoints that automatically trip the RWCU pumps; also list all pump start permissives. 5035 List all the RWCU system and Filter Demineralizer isolations including setpoints and valves affected.

RATING: L2

ATTACHMENT: None

JUSTIFICATION: RWCU-P-1B trips on low flow of 70 gpm (C and D are incorrect) RWCU-V-44 does not have any automatic features associated with its operation. (C is incorrect). Both RWCU-V-1 and RWCU-V-4 remain open as there are no isolation signals from low system flow (B is incorrect). A is correct

QUESTION # 55 OCTOBER 2009

Columbia is operating at rated power with control rod 18-15 at position 24. A scram occurs and the inlet scram valve for control rod 18-15 does not open.

When CRO1 provides control rod information as part of the scram report, which of the following is correct control rod information for that report and also identifies the status of the reactor?

A. All control rods except for control rod 18-15 are full in. Control Rod 18-15 is at position 24; The reactor is shutdown under all conditions.

B. All control rods have fully inserted. The reactor is shutdown under all conditions.

C. All control rods except for control rod 18-15 are full in. Control Rod 18-15 is at position 24; The reactor will not remain shutdown under all conditions.

D. All control rods except for control rod 18-15 are full in. Control Rod 18-15 is slowly drifting out of the core; The reactor is shutdown under all conditions.

ANSWER: B

KA # & KA VALUE:	201003 K6.01 Knowledge of the effect that a loss or malfunction of the following will have on the Control Rod and Drive Mechanism: Control Rod Hydraulic System (3.3 / 3.3)
REFERENCE:	SD000137 Page 14, 15
SOURCE:	New
LO:	11835 Predict the effect that a loss or malfunction of the following will have on the Control Rod Drive Mechanism: a. Control rod drive hydraulic system
RATING:	H2
ATTACHMENT:	None
JUSTIFICATION:	Two pressures will insert a control rod – CRDH and reactor pressure. Since the inlet scram did not open, reactor pressure inserted the rod. The rod will be full in and the reactor will be S/D under all conditions (this is true even with one control rod full out) B is correct.

QUESTION # 56 OCTOBER 2009

With a Traversing In-Core Probe (TIP) trace in progress the plant experiences a High Drywell Pressure scram.

Which of the following is correctly describes the response of the TIP System?

A. The Group 3 isolation signal withdraws the probe, closes the Ball and Shear valves, and closes the Purge Isolation valve, TIP-V-15.

B. The Group 3 isolation signal withdraws the probe, closes the Ball valve, and closes the Purge Isolation valve, TIP-V-15.

C. The Group 4 isolation signal withdraws the probe, closes the Ball and Shear valves, and closes the Purge Isolation valve, TIP-V-15.

D. The Group 4 isolation signal withdraws the probe, closes the Ball valve, and closes the Purge Isolation valve, TIP-V-15.

ANSWER: D

KA # & KA VALUE:	215001 K1.05 Knowledge of the physical connections and/or cause-effect relationship between Traversing In-Core Probe and the following: Primary containment isolation system (3.3 / 3.4)
REFERENCE:	SD000155 Page 13; SD000173 Page 24
SOURCE:	New
LO:	6989 Explain the TIP system response to an "FA" (LOCA) signal.
RATING:	H2
ATTACHMENT:	None
JUSTIFICATION:	NS4 Group 4 is the isolation group for TIP valves (A and B are incorrect). The Shear valves do not get a closed signal on TIP isolation (C is incorrect) D is correct. Could also change distractors to – what happens of probe doesn't withdraw and shear fires automatically or is manually done (LX00570)

QUESTION # 57 OCTOBER 2009

Columbia is operating at 100% power when breaker N1/2 trips open.

Assuming no operator action, which of the following describes a correct plant response and the procedure necessary to mitigate the consequences of that plant response?

A. RFW-P-1B trips. ABN-LEVEL should be referenced.

B. COND-P-1B and COND-P-2B trip. PPM 3.3.1, Reactor Scram, should be referenced.

C. RRC-P-1A and RRC-P-1B run back to 30 Hz. ABN-RRC-LOSS should be referenced.

D. RFW-P-1A trips. ABN-ELEC-SM2/SM4 should be referenced.

ANSWER: D

KA # & KA VALUE: 259001 A2.03 Ability to (a) predict the impacts of the following on the Reactor Feedwater System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of condensate pumps (3.6 / 3.6)

REFERENCE: ABN-ELEC-SM2/SM4 page 2; ABN-POWER Page 2; 4.840 A-1 8-3 and 8-7

SOURCE: New

LO: 5749 State the function, purpose and design feature of each of the following: a. RFW Pump; 6809 Given a loss of SM-2, identify the automatic actions that may have occurred.

RATING: H3

ATTACHMENT: None

JUSTIFICATION: A trip of the N1/2 breaker will trip COND-P-1B and COND-P-2B but a scram will not result (B is incorrect). RRC Pumps do run back to 30 Hz but this ABN-RRC-LOSS does not mitigate this plant response (C is incorrect). RFW-P-1B does not trip (A is incorrect). RFW-P-1A does trip and ABN-ELEC-SM1/SM7 should be referenced. D is correct

QUESTION # 58 OCTOBER 2009

Columbia is operating at rated power when CRO1 notes RFW-LI-606A, 606B and 606C, Narrow Range Reactor Water Level indicators, all indicate +36" but MS-LI-604, Wide Range Reactor Water Level Indicator, indicates +18 inches.

Which of the following explains the difference between Narrow Range and Wide Range level indication?

The level discrepancy results…..

A. from the difference in height of the reference leg tap for the Wide Range compared to that of the Narrow Range.

B. because Wide Range detects level inside the core by sensing the pressure at the jet pump diffuser.

C. from the pressure drawdown effect of the jet pump flow past the Wide Range variable line tap.

D. from an increased level in the downcomer area due to the pressure drop across the steam dryer.

ANSWER: C

KA # & KA VALUE: 216000 K5.09 Knowledge of the operations implications of the following concepts as they apply to Nuclear Boiler Instrumentation: Recirculation flow effects on level indications: Design Specific (2.9 / 2.9)

REFERENCE: SD000126 page 6, 15, and 16

SOURCE: New

LO: 5588 Explain the level difference between wide range and narrow range indications during power operations.

RATING: H2

ATTACHMENT: None

JUSTIFICATION: Per the reference, the delta level is due to from the pressure drawdown effect of the jet pump flow past the Wide Range variable line tap. C is correct

QUESTION # 59 OCTOBER 2009

The control rod drive housing support structure (shootout steel) ...

A. provides vertical support to the control rod drive housing.

B. minimizes the distance a control rod drive mechanism could be ejected.

C. provides lateral support to the control rod drive housing.

D. diverts Control Rod Drive system flow into the control rod drive mechanisms.

ANSWER: B

KA # & KA VALUE: 290002 K1.11 Knowledge of the physical connections and/or cause-effect relationship between Reactor Vessel Internals and the following: CRD Mechanism (2.9 / 2.9)

REFERENCE: SD000125 Page 14

SOURCE: Bank Modified slightly LO00881

LO: 5004 State the function, purpose and design features of the following Reactor Pressure Vessel components: e. Control Rod Drive housing support structure

RATING: L2

ATTACHMENT: None

JUSTIFICATION: RPV Internal component, the CRD housing support structure, minimizes the distance a control rod drive mechanism could be ejected from the core. B is correct.

QUESTION # 60 OCTOBER 2009

Which of the following describes the automatic initiation of the Halon Fire Suppression System to a fire in a Control Room floor module?

A. One Halon container will discharge immediately. The second and third Halon containers will discharge automatically after a time delay.

B. One Halon container will discharge immediately. The second and third Halon containers will discharge automatically only if the fire has not been extinguished.

C. Two Halon containers will discharge immediately. The third Halon container will discharge automatically only if the fire has not been extinguished.

D. All three Halon containers discharge immediately into the affected floor module.

ANSWER: A

KA # & KA VALUE: 286000 K4.02 Knowledge of the Fire Protection System design feature(s) and/or interlocks which provide for the following: Automatic System Initiation (3.3 / 3.5)

REFERENCE: Sd000177 Page 12

SOURCE: New

LO: 5376 Briefly explain the operation of the following types of fire suppression systems: e. Control Room Halon 1301 Floor Modules

RATING: L3

ATTACHMENT: None

JUSTIFICATION: Per the reference one container discharges immediately and the second and third after a time delay. A is correct.

As Columbia begins operations after a refueling outage, the Control Rod Scram Time Testing surveillance, TSP-CRD-C101, is being performed. The following data has been recorded during the testing of a fully withdrawn control rod:

Time: 0.0 - The First Accumulator test switch is taken to the test position
0.3 - Scram Pilot Valve solenoids de-energize
0.6 - Full core display ‘Scram Valve’ blue light illuminates
0.8 - Full core display ‘Full-Out’ red light extinguishes
5.0 - Notch 5 position indication is received
5.8 - Full core display ‘Full-In’ green light illuminates

From the above information, select the appropriate scram time.

A. 4.7 seconds

B. 5.0 seconds

C. 5.5 seconds

D. 5.8 seconds

ANSWER: A

KA # & KA VALUE: 201001 2.2.22 Control Rod Drive Hydraulic System: Knowledge of the limiting conditions for operation and safety limits. (4.0 / 4.7)

REFERENCE: TSP-CRD-C101; TS 3.1.4 Table 3.1.4-1 note (a)

SOURCE: New

LO: 5219 Referencing Technical Specifications associated with the Control Rod Drive Mechanism and a set of plant conditions, determine as applicable the LCO, the action statement, and the appropriate bases.

RATING: H2

ATTACHMENT: T.S. 3.1.4 pages 1&4

JUSTIFICATION: Rod Scram Time Testing Surveillance states that for a rod to be declared operable it must meet the TS scram time . TS indicates that scram time start, for a fully withdrawn control rod, is based on de-energization of scram pilot valve solenoid so start time is 0.3 seconds and reaches position 5 at 5.0 seconds therefore scram time is 4.7 seconds. A is correct.

QUESTION # 62 OCTOBER 2009

Columbia was operating at rated power when a reactor scram with loss of the Startup Transformer occurred.

Which of the following Drywell fans started, or if they were previously running, re-started, when power was restored to SM-7?

A. Only Drywell Head Exhaust Fan CRA-FN-4A

B. Lower Cooling Fans CRA-FC-1A1 and CRA-FC-1A2
Upper Cooling Fans CRA-FC-2A1 and CRA-FC-2A2

C. Drywell Head Exhaust Fan CRA-FN-4A
Lower Recirc Fan CRA-FN-3A
Upper Recirc Fan CRA-FN-5A

D. Drywell Head Exhaust Fan CRA-FN-4A
Lower Cooling Fans CRA-FC-1A1 and CRA-FC-1A2
Upper Cooling Fans CRA-FC-2A1 and CRA-FC-2A2

ANSWER: C

KA # & KA VALUE:	223001 A4.11 Ability to manually operate and/or monitor in the control room: Drywell coolers/chillers (3.5 / 3.6)
REFERENCE:	SD000127 page 11
SOURCE:	Bank modified LX00878
LO:	5639 State what will cause the following components to automatically start or valves to operate: a. Drywell head exhaust (CRA-FN-4A and 4B); b. Lower drywell cooling fans (CRA-FC-1A1, 1A2, 1B1, 1B2, 1C1 and 1C2); c. Upper drywell cooling fans (CRA-FC-2A1, 2A2, 2B1 and 2B2)
RATING:	L3
ATTACHMENT:	None
JUSTIFICATION:	CRA-FN-3A and 5A re-start automatically (A is incorrect) CRA-FN-4A starts on scram; CRA-FC-1A1, 1A2, 2A1 and 2A2 do not auto restart (B and D are incorrect) C is correct

QUESTION # 63 OCTOBER 2009

Which of the following radiation monitors is powered from the Reactor Protection System (RPS)?

A. Offgas Post Treatment Radiation Monitors - OG-RIS-601A and OG-RIS-601B

B. Low Range Reactor Building Stack Radiation Monitor - PRM-RE-1A

C. Reactor Building Exhaust Radiation Monitors - REA-RIS-609A and REA-RIS-609B

D. Main Steam Line Radiation Monitors - MS-RIS-610A and MS-RIS-610B

ANSWER: D

KA # & KA VALUE:	272000 K2.01 Knowledge of the power supplies to the following: Main Steam line Radiation Monitors (2.5 / 2.8)
REFERENCE:	SD000147 Page 33, 34, and 35
SOURCE:	New
LO:	5649 List the power supplies for each of the following process Radiation Monitors: a. Reactor Building Exhaust Plenum RMS; b. Main Steam Line RMS; c. Off-Gas RMS; d. Radwaste Liquid RMS; e. Control Room HVAC RMS
RATING:	L3
ATTACHMENT:	None
JUSTIFICATION:	OG-RIS-601A is powered from US-PP (A is incorrect); PRM-RE-1A is powered from PP-7BC (B is incorrect); REA-RIS-609A/B are powered from PP-7A-A (C is incorrect); Main Steam Line radiation monitors are powered from RPS D is correct

QUESTION # 64 OCTOBER 2009

Columbia is operating in MODE 1 with a RHR surveillance is in progress. For the surveillance, Suppression Pool (Wetwell) sprays and Suppression Pool cooling have been manually initiated with 'B' RHR system flow at 7800 gpm. The following valve lineup exists:

RHR-V-27B (Suppression Pool/Wetwell Spray) – open
RHR-V-24B (Suppression Pool Cooling) – partially open
RHR-V-48B (Heat Exchanger Bypass) – closed
RHR-V-64B (Minimum Flow) – closed

If the plant were to experience a High Drywell Pressure scram, which of the following is the resultant RHR system lineup?

A. RHR-V-24B closes, RHR-V-27B remains open, RHR-V-48B opens, and RHR-V-64B remains closed.

B. RHR-V-24B and RHR-V-27B close, and RHR-V-48B and RHR-V-64B open.

C. RHR-V-24B and RHR-V-48B open, RHR-V-27B remains open, and RHR-V-64B remains closed.

D. RHR-V-24B and RHR-V-27B close, RHR-V-48B remains closed, and RHR-V-64B opens.

ANSWER: B

KA # & KA VALUE: 230000 K4.06 Knowledge of RHR/LPCI: Torus/Suppression Pool Spray Mode design feature(s) and/or interlocks which provide for the following: Pump minimum flow protection (2.8 / 3.1)

REFERENCE: SD000198 Pages 17, 18, 19, 20 and 23

SOURCE: New

LO: 5781 List the interlocks and trips associated with the following RHR System components: f. RHR-V-24A/B and RHR-V-27A/B and h. RHR-V-64A/B

RATING: H2

ATTACHMENT: None

JUSTIFICATION: On an initiation signal – RHR-V-24B closes; RHR-V-27B closes; RHR-V-48B opens and RHR-V-64B opens if flow LT 800 gpm. B is correct

QUESTION # 65 OCTOBER 2009

With the reactor in MODE 5, a control rod withdraw block occurs if:

A. the Refueling Bridge is over the Reactor.

B. a control rod is withdrawn to position 12 as the Refueling Bridge moves from the Spent Fuel Pool to over the Reactor.

C. the Refueling Bridge's Main Hoist is loaded and is not in the full-up position while the Refueling Bridge is moving over the Spent Fuel Pool.

D. the Refueling Bridge's Main Hoist is loaded as the Refueling Bridge moves from the Spent Fuel Pool to over the Reactor.

ANSWER: D

KA # & KA VALUE:	234000 A3.02 Ability to monitor automatic operation of the Fuel Handling Equipment including: Interlock Operation (3.1 / 3.7)
REFERENCE:	SD000207 Page 25, 26, 31
SOURCE:	New
LO:	5360 List and explain all the conditions pertaining to fuel handling equipment that can cause a control rod block when the reactor mode switch is in either the REFUEL position or the START/HOT STBY position.
RATING:	L2
ATTACHMENT:	None
JUSTIFICATION:	A and B are incorrect as the hoist needs to be loaded; C is incorrect as this is not a interlock. D is correct

QUESTION # 66 OCTOBER 2009

The CRS has directed you to have an Equipment Operator enter a Locked High Radiation Area (LHRA) to close a valve that will protect the health and Safety of the public by stopping an off-site release path.

Who has the authority to issue the key needed to access the LHRA in this emergency?

The key is issued with the authorization of the……

A. Shift Technical / Incident Advisor.

B. Control Room Supervisor.

C. Shift Manager.

D. Operations Manager.

ANSWER: C

KA # & KA VALUE: 2.3.12 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. (3.2 / 3.7)

REFERENCE: PPM 11.2.7.3 Page 19

SOURCE: New

LO: 6037 State from memory, the requirements for all personnel entering a locked High Radiation Area greater than 1000 mrem per hour. [PPM 11.2.7.3]

RATING: L3

ATTACHMENT: None

JUSTIFICATION: Per reference the Shift Manager authorizes key use and entry. C is correct.

QUESTION # 67 OCTOBER 2009

With the plant operating at rated power, the Security Lieutenant calls and informs the Control Room that a Plant Specific Credible Threat to Columbia has been received.

Which of the following is an immediate actions for this event?

A. Authenticate the call by verifying the four digit security code is correct.

B. Stop RWCU-P-1A(B); Close RWCU-V-1 and RWCU-V-4; Throttle open RWCU-V-104.

C. Perform a controlled Reactor Shutdown per PPM 3.2.1.

D. Reduce RRC flow to 60 Mlbm/Hr and insert a manual scram.

ANSWER: B

KA # & KA VALUE: 2.4.28 Knowledge of procedures related to a security event (non-safeguards information). (3.2 / 4.1)

REFERENCE: ABN-SECURITY Page 3

SOURCE: New

LO: 10365 State the immediate actions (and bases) associated with ABN-SECURITY.

RATING: L3

ATTACHMENT: None

JUSTIFICATION: Per ABN-SECURITY B is correct and the only immediate action that is performed.

QUESTION # 68 OCTOBER 2009

A plant startup is in progress following a refueling outage. CRO2 is in the process of starting RCC-P-1B, the first Reactor Closed Cooling Water pump to be started, per SOP-RCC-START. OPS2 was directed to and has closed RCC-V-2B. CRO2 has just started RCC-P-1B and reads the next step which should be to open RCC-V-2B but the step states “Open RCC-V-2A”.

Which of the following is correct?

A. The error should first be brought to the attention of the CRS. The CRS may authorize an editorial change to allow startup of the RCC pump/system. The hard copy is marked up to correct the error and the page is signed and dated by the CRS.

B. CRO2 has the authority to fix the editorial error. The hard copy is marked up to correct the error and the page is signed and dated by CRO2. Startup of the RCC pump/system may then proceed.

C. The error should first be brought to the attention of the CRS. The CRS may authorize a verbal change to allow startup of the RCC pump/system. A Procedure Change Notice should be completed by CRS prior to leaving at the end of the day.

D. CRO2 has the authority to fix the obvious editorial error. A Procedure Change Notice should be completed by CRO2 prior to leaving at the end of the day. Startup of the RCC pump/system may then proceed.

ANSWER: A

KA # & KA VALUE: 2.2.6 Knowledge of the process for making changes to procedures (3.0 / 3.6)

REFERENCE: SWP-PRO-02 Page 14, 15 and 36

SOURCE: New

LO: 12200 State when an editorial change may be made and what documentation is required.

RATING: L2

ATTACHMENT: None

JUSTIFICATION: Reference allows an editorial to be completed for obvious EPN errors. A PCN is not required (C and D are incorrect). The CRS authorizes editorial changes (A is correct and B is incorrect).

QUESTION # 69 OCTOBER 2009

Which of the following indicates an alarm, that if received, is associated with an EAL declaration?

The annunciator window…..

A. is colored red.

B. is colored orange.

C. has a black dot in its corner.

D. has an orange triangle in its corner.

ANSWER: C

KA # & KA VALUE:	2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm (4.1 / 4.3)
REFERENCE:	OI-15 Page 4
SOURCE:	New
LO:	11270 Knowledge of annunciators alarms and indications / and use of the response instructions.
RATING:	L2
ATTACHMENT:	None
JUSTIFICATION:	Per OI-15, a black dot in the corner of an annunciator indicates it may have EAL significance C is correct

QUESTION # 70 OCTOBER 2009

While operating at power, a number of alarms on H13-P601 annunciate. Investigating, you note the 'HPCS Engine Cranking' and the 'HPCS System Actuation' alarms are annunciating. You believe this is an invalid HPCS actuation.

Which of the following indicates the minimum that must be performed prior to securing HPCS-P-1?

A. Verify two RPV level indications indicate RPV Level is GT -50".

B. Verify two Drywell pressure indication indicate Drywell pressure is LT 1.68 psig.

C. Verify one RPV level indication indicates RPV Level is GT -50" and one Drywell pressure indication indicates Drywell pressure is LT 1.68 psig.

D. Verify two RPV level indication do not indicate RPV Level is LT -50" and two Drywell pressure indication do not indicate Drywell pressure is GT 1.68 psig.

ANSWER: D

KA # & KA VALUE: 2.1.45 Ability to identify and interpret diverse indications to validate the response of another indication (4.3 / 4.3)

REFERENCE: ABN-POWER page 4

SOURCE: New

LO: 6757 Given plant annunciation and indications, evaluate conditions for entry into ABN-POWER due to an inadvertent HPCS injection.

RATING: H2

ATTACHMENT: None

JUSTIFICATION: Per reference caution, two independent indications should be performed. A is incorrect because it only addresses the RPV level initiation. B is incorrect as it only addresses the DW pressure initiation. C is incorrect as it only addresses one indication for RPV level and one indication for DW pressure. D is correct

QUESTION # 71 OCTOBER 2009

A reactor startup is being performed following a refueling outage. As CRO1, you have reached the "Approach to Criticality". As you withdraw the next control rod , the 'SRM PERIOD FAST' annunciator alarms. You observe a steady reactor period of 20 seconds.

Which of the following is procedurally required?

A. Insert control rods until the reactor is subcritical.

B. Insert control rods until reactor period stabilizes at LT 60 seconds.

C. Insert control rods until reactor period stabilizes at LT 25 seconds.

D. Insert a manual reactor scram.

ANSWER: A

KA # & KA VALUE: 2.2.2 Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels (4.6 / 4.1)

REFERENCE: PPM 3.1.2 Caution 10 and 4.603.A7 5-6

SOURCE: New

LO: 6663 With the procedures available, determine the actions to be taken for a reactor period shorter than 25 seconds due to an unplanned reactivity rise.

RATING: H3

ATTACHMENT: None

JUSTIFICATION: Per reference, control rods are inserted to obtain reactor sub-critical – A is correct

QUESTION # 72 OCTOBER 2009

Columbia is operating in MODE 1. It is a Division 1 work week and DG-1 is being run for its monthly operability check when it experiences an unplanned automatic shutdown.

Which of the following is required?

Within 1 hour…..

A. establish risk management actions for the alternate AC sources.

B. determine that operable DG(s) are not inoperable due to common cause failure.

C. perform SR 3.8.1.1, Offsite Station Power Alignment Check surveillance procedure.

D. declare required features(s) supported by inoperable DG inoperable when redundant required feature(s) are inoperable.

ANSWER: C

KA # & KA VALUE: 2.2.39 Knowledge of the less than or equal to one hour Technical Specification action statements for systems (3.9 / 4.5)

REFERENCE: TS 3.8.1

SOURCE: New

LO: 9540 Given appropriate conditions, indications, and copies of Technical Specifications, determine when an entry condition is met and interpret the required Tech Spec actions from an analysis of plant conditions.

RATING: H3

ATTACHMENT: None

JUSTIFICATION: A is incorrect as it is a 72 hour completion time. B is incorrect as it is a 24 hour completion time. D is incorrect as it is a 4 hour completion time. C is correct as it is a one hour completion time.

COMMENT: This is a Tech Spec requirement that Operations has determined will be Reactor Operator required knowledge.

QUESTION # 73 OCTOBER 2009

An Offsite release is in progress and Columbia has declared a General Emergency. All Emergency Response Centers have been declared operational. It has been determined that an operator must enter an area that will have him exceed the 10 CFR 20 occupational exposure limit.

Who has the authority to approve exceeding the 10 CFR 20 dose limit?

A. Shift Manager

B. Emergency Director

C. Plant Manager

D. Radiation Protection Manager

ANSWER: B

KA # & KA VALUE:	2.4.37 Knowledge of the lines of authority during implementation of the emergency plan (3.0 / 4.1)
REFERENCE:	PPM 13.2.1 Page 4
SOURCE:	New
LO:	6020 State who approves emergency exposures above the 10CFR20 limits.
RATING:	L3
ATTACHMENT:	None
JUSTIFICATION:	Per PPM 13.2.1 the Emergency Director has the authority to approve exposures GT 10 CFR 20 limits – B is correct

QUESTION # 74 OCTOBER 2009

When releasing tags to returning equipment to service, which of the following component tags would require Independent verification (IV) that should not be waived?

A. RCC-V-6 (RCC Supply to Non-Containment components) hand wheel tag

B. REA-FN-1A (‘A’ Reactor Building Exhaust Fan) breaker tag

C. SGT-FN-1B1 (‘B’ Standby Gas Treatment System Lag Fan) breaker tag

D. COND-FCV-15A (‘A’ CBP Minimum Flow Control valve) control switch tag

ANSWER: C

KA # & KA VALUE: 2.2.13 Knowledge of tagging and clearance procedures (4.1 / 4.3)

REFERENCE: PPM 1.3.64 page 5; PPM 1.3.1 pages 36 and 37

SOURCE: New

LO: 6234 State what classification of component require ‘independent verification’ of clearance order tags and when this type of verification is allowed to be waived.

RATING: L2

ATTACHMENT: None

JUSTIFICATION: IV is required for Safety-Related, Essential Radwaste or Fire Protection components. The Exception to this is MOV handwheel tag removal provided the MOV has remote indication that can be used to verify position. SGT-FN-1B is a safety related component, C is correct. A is safety related but remote indication is available and IV could be waived. B and D are not safety related components-

QUESTION # 75 OCTOBER 2009

Which of the following are required in order to maintain an active NRC Reactor Operating license?

Have a medical exam, performed by the site doctor, once…….

A. each calendar year; Actively perform the functions of a Reactor Operator on a minimum of four 12 hour (at least 40 hours) shifts per calendar quarter.

B. every two years; Actively perform the functions of a Reactor Operator on a minimum of four 12 hour (at least 40 hours) shifts per calendar quarter.

C. each calendar year; Actively perform the functions of a Reactor Operator on a minimum of five 12 hour (60 total hours) shifts per calendar quarter.

D. once every two years; Actively perform the functions of a Reactor Operator on a minimum of five 12 hour (60 total hours) shifts per calendar quarter.

ANSWER: D

KA # & KA VALUE: 2.1.4 Knowledge of licensed operator responsibilities related to shift staffing, such as medical requirements, "no-solo" operation, maintenance of active license status, 10CFR55, etc. (3.3 / 3.8)

REFERENCE: PPM 1.3.1 page 65 and 66

SOURCE: New

LO: 6094 State the responsibilities of the Control Room Operator (CRO).

RATING: L2

ATTACHMENT: None

JUSTIFICATION: License maintenance is five 12 hour shifts. License Reactivation is four 12 hour shifts (A and B are incorrect), A Medical exam is required once each 2 years (C is incorrect) D is correct.

With Columbia operating at rated power, a smoldering feeder breaker has resulted in MC-7F becoming deenergized. A short time later the output from the IN-1 inverter is lost.

Which of the following occurs due to this loss of power and what procedure would be entered to mitigate the resultant effect on the plant?

A. A trip of RCC-P-1A (if running). Enter ABN-RCC.

B. The inboard MSIVs close. Enter PPM 3.3.1, Reactor Scram.

C. The IN-1 static switch swaps to the Bypass AC source. Enter ABN-ELEC-INV.

D. A loss of power to the feed water heater controllers occurs. Enter ABN-POWER.

ANSWER: D

KA # & KA VALUE: 262002 A2.01 Ability to (a) predict the impacts of the following on the UPS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Under Voltage (2.6 / 2.8) 55.43.5

REFERENCE: ABN-ELEC-INV Page 2, 3 and 4; SD000194 figure 3

SOURCE: New

LO: 6827 Given a loss of IN-1, identify those automatic actions that may have occurred.
6742 Given plant annunciation and indications, evaluate conditions for entry into ABN-POWER due to an unplanned loss of feedwater heating.

RATING: L2

ATTACHMENT: None

JUSTIFICATION: MC-7F is the bypass source the static switch would automatically swap to – C is incorrect. The Inboard MSIVs close due to a loss of IN-2 – B is incorrect. A trip of RCC-P-1A occurs on a loss of IN-3 – A is incorrect. A loss of power to IN-1 results in a loss of power to US-PP and FWH controller loss of power with valves failing open. ABN-POWER would be entered due to loss of feedwater heating. D is correct.

Given the following timeline:

T = 0	Fire alarm received for the ‘B’ Service Water Pump House
T = 4 minutes	OPS4 is sent to investigate
T = 10 minutes	HPCS-P-2 trips
T = 17 minutes	OPS4 reports a fire in the ‘B’ Service Water Pump House

Concerning the above, which of the following is correct?

A. An Unusual Event should be declared within 15 minutes of OPS4 reporting the fire at T = 17 minutes.

B. An Alert should be declared within 15 minutes of OPS4 reporting the fire at T = 17 minutes.

C. You should declare an Unusual Event within 15 minutes of the receipt of the fire alarm at T = 0 minutes.

D. You should declare an Alert within 15 minutes of the indication that HPCS-P-2 tripped at T = 10 minutes.

ANSWER: C

KA # & KA VALUE: 600000 2.4.41 Knowledge of the emergency action level thresholds and classifications (2.9 / 4.6) 55.43.5

REFERENCE: PPM 13.1.1A page 154, 155, and 157

SOURCE: New

LO: 6131 With procedures available for reference and plant conditions such that an emergency classification be declared, correctly classify the event.

RATING: H2

ATTACHMENT: YES – PPM 13.1.1 blocks for 9.2.U.1 and 9.2.A.1

JUSTIFICATION: HPCS-P-2 is located in the ‘A’ SSW Pumphouse so the trip doesn’t ramp the fire to an Alert level – B and D are incorrect. The UE is declared 15 minutes after the receipt of the alarm and not 15 minutes after the report of the fire from OPS4 B is incorrect. C is correct

Columbia is operating at the end of its 2-year refueling cycle. Reactor power is 94 percent with all control rods fully withdrawn. Due to a problem associated with a Reactor Feedwater Pump, Reactor Power was reduced to 65 percent for three days. During that time the Master Flow Controller, RRC-M/A-R675 was found to be in need of repairs. In response, the CRS directed that the Individual flow controllers, RRC-M/A-R676A and RRC-M/A-R676B be placed in manual. After the RFW pump was returned to service, Reactor power is to be raised at the maximum rate allowed.

Which of the following is correct?

A. Directions should be given to raise power with flow not to exceed the Tech Spec limit of 2000 gpm difference between A and B loops. Two handed operation is authorized for this evolution. Due to the effects of Xenon, Reactor power will peak to a value LT 94%.

B. Directions should be given to raise power with flow not to exceed the Tech Spec limit of 2000 gpm difference between A and B loops. Two handed operation is not authorized for this evolution. Due to the effects of Xenon, Reactor power will peak to a value GT 94%.

C. Directions should be given to raise power with flow not to exceed the Tech Spec limit of 3000 gpm difference between A and B loops. Two handed operation is not authorized for this evolution. Due to the effects of Xenon, Reactor power will peak to a value LT 94%.

D. Directions should be given to raise power with flow not to exceed the Tech Spec limit of 3000 gpm difference between A and B loops. Two handed operation is authorized for this evolution. Due to the effects of Xenon, Reactor power will peak to a value GT 94%.

ANSWER: B

KA # & KA VALUE:	202002 A2.09 Ability to (a) predict the impacts of the following on the Recirculation Flow Control System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Recirculation Flow mismatch (3.1 / 3.3) 55.43.2 & 55.43.6
REFERENCE:	TS 3.4.1.1; OI-56
SOURCE:	New
LO:	9569 Given appropriate conditions, indications and copies of TS, interpret required TS actions from an analysis of plant conditions.
RATING:	L3
ATTACHMENT:	None
JUSTIFICATION:	OI-56 and TS 3.4.1.1 allows a delta loop flow of 2000 gpm - C and D are incorrect. Xenon effects on core would allow power to be GT 94% - A and C are incorrect. Two handed operation is not allowed for this evolution – A and D are incorrect. B is correct.

Columbia operating at rated power. An event occurs that leaves plant parameters as follows:

Reactor power was 100% and is now at approximately 97%.
Indicated core flow was 106.5 Mlbm/hr and is now indicating 109.88 Mlbm/hr.
RRC pump speeds are the same as before the event - RRC-P-1A at 59.7 Hz and RRC-P-1B at 59.6 Hz.

Based on the above indications, which of the following is correct?

A. Enter ABN-CORE. Satisfy the requirements of the LCO within 2 hours or reduce Thermal Power to LE 25% RTP within 4 hours.

B. Enter ABN-CORE. Immediately verify by administrative means that RCIC is operable when it is required to be operable.

C. Enter ABN-POWER. Commence a Technical Specification required shutdown and be in MODE 3 in 12 hours.

D. Enter ABN-POWER. Declare the recirculation loop with the lower flow to be “not in operation” within 2 hours.

ANSWER: C

KA # & KA VALUE: 295001 AA2.05 Ability to determine and/or interpret the following as they apply to partial or Complete Loss of Forced Flow Core Flow Circulation: Jet Pump operability (3.1 / 3.4) 55.43.2 and 55.43.5

REFERENCE: ABN-POWER Page 2 and 7; ABN-CORE page 2; TS 3.4.1, TS 3.4.2, and TS 3.2.4

SOURCE: New

LO: 11784 Discuss the operational implications of the following concepts as they apply to the RRC System: b. Jet Pump Operation

RATING: H2

ATTACHMENT: YES TS 3.4.2-1; 3.2.4-1; 3.4.1-1

JUSTIFICATION: There are no entry conditions for ABN-CORE A and B are incorrect; TS actions are based on APRM Gain and Setpoint, ECCS Operating, and Recirculation Loops Operating, D is incorrect. C is correct as ABN-POWER is entered and be in MODE 3 in 12 hours is required by TS on Jet Pump failure

Columbia has experienced a series of events that has resulted in the following plant parameters:

RPV Pressure is 80 psig and steady
RPV Level is –185" and is trending up
PRM-RE-1B is reading 6500 cps and trending down
Wetwell Level is +40 foot and trending up
Wetwell Pressure is 80 psig and steady
Primary Containment hydrogen is 1% and steady

Based on the above, which of the following is correct?

Perform actions associated with…….

A. SOP-CN-CONT-VENT.

B. ABN-CONT-VENT.

C. PPM 5.5.14, 'Emergency Wetwell Venting'.

D. PPM 5.7.1, 'RPV & PC Flooding Severe Accident Guidelines'.

ANSWER: A

KA # & KA VALUE: 500000 EA2.03Ability to determine and/or interpret the following as they apply to High Off-Site Release Rate: Radiation Levels (3.5 / 4.3) 55.43.5

REFERENCE: PPM 5.2.1 PC Gas leg and PC Pressure leg; ABN-CONT-VENT entry conditions

SOURCE: New

LO: 11150 Given plant conditions and EOP flowcharts, evaluate plant conditions and determine the appropriate actions according to PPM 5.2.1.

RATING: H2

ATTACHMENT: Yes: PPM 5.2.1: PC Gas leg & Table 27 and PC Pressure Leg blocks P-13 and P-14 and PCPL Curve

JUSTIFICATION: D is incorrect as PC flood is required if level cannot be 'restored' and maintained GT –183. While level is LT –183 it is trending up and can be 'restored' GT –183"; C is incorrect as WW/P is 80 psig and block P-14 should not be performed. B is incorrect as Entry conditions to ABN are loss of all AC and DC Power. A is correct as radiation level is LT Table 27 reading as SOP-CN-CONT-VENT should be performed.

QUESTION # 6 OCTOBER 2009

With Columbia at rated power, an unplanned MSIV isolation signal was generated during the performance of an I&C Surveillance. The Reactor scrammed and RPV water level dropped to –55 inches causing a NS4 Group 1 isolation. HPCS and RCIC initiated and restored RPV level.

1. The initial MSIV closure was invalid and therefore is not reportable
2. Both the MSIV closure and Reactor Scram were caused by an invalid signal and are not reportable
3. Only the RPV injection by ECCS was caused by a valid signal and is reportable
4. Both the RPV injection by ECCS and the subsequent NS4 isolation were caused by valid signals and are reportable

Which of the following correctly identifies the 10 CFR 50.72 reporting requirements of the above event?

A. 2 only

B. 4 only

C. 2 and 3

D. 1 and 4

ANSWER: D

KA # & KA VALUE: 2.4.30 Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as State, the NRC, or the transmission system operator. (2.7 / 4.1) 55.43.5

REFERENCE: PPM 1.10.1 page 4 and 8

SOURCE: New

LO: 6011 With Admin procedures available, determine the NRC notification requirements and the time limits.

RATING: H3

ATTACHMENT: None

JUSTIFICATION: Item 1 is correct; Item 2 is incorrect as the Scram signal was valid; Item 3 is incorrect as the Scram and NS4 signals were also valid signals; Item 4 is correct – Only answer D identifies both correct answers

Given the following parameters:

HPCS and CRD are injecting into RPV
RPV Pressure is 550 psig and down slow
RPV Level is –158 inches and steady
Drywell Temperature is 335 degrees F and up slow
Drywell Pressure is 8 psig and up slow
Wetwell Pressure is 1.5 psig and up slow
Wetwell level is 29 feet and steady

Which of the following should be prioritized as the next action to be taken?

A. Raise WW level per PPM 5.5.23

B. Initiate Wetwell Sprays

C. Initiate Drywell sprays

D. Open 7 ADS SRVs

ANSWER: C

KA # & KA VALUE: 295028 EA2.01 Ability to determine and/or interpret the following as they apply to High Drywell Temperature: Drywell Temperature (4.0 / 4.1) 55.43.5

REFERENCE: PPM 5.0.10 Page 260

SOURCE: New

LO: 11150 Given plant conditions and EOP flowcharts, evaluate plant conditions and determine the appropriate actions according to PPM 5.2.1

RATING: H3

ATTACHMENT: Yes: PPM 5.2.1 DW Temp leg blocks DT-3 to end of column; WW Level block L-1; DSIL Curve

JUSTIFICATION: HPCS is required for adequate core cooling – A is incorrect; WW/P is not GT 2 psig which is required to initiate WW sprays – B is incorrect; Parameters given are not within DSIL spray initiation prohibited region and even though DW/T is GT 330°F the block says ED is required when DW/T cannot be restored and maintained LT 330°F which allows that parameter to be exceeded – C is correct and D is incorrect

QUESTION # 8 OCTOBER 2009

Columbia is operating in MODE 1. The control power fuses for HPCS-P-1 were removed two days ago per 4.601.A1 6-7 HPCS WATER LEG PUMP DISCH PRESS LOW alarm response procedure when HPCS-P-3, the water leg pump, failed. During preventive maintenance on the battery breaker to MC-S2-1A, MC-S2-1A becomes de-energized.

Which of the following is correct?

A. Be in MODE 3 within 12 hours and reduce reactor pressure to LE 150 psig within 36 hours.

B. Restore HPCS to operable status within the next 12 days (14 days minus 2 days).

C. Enter Tech Spec 3.0.3 immediately and be in MODE 2 within 7 hours and MODE 3 within 13 hours.

D. Be in MODE 3 within 12 hours and be in MODE 4 within 36 hours.

ANSWER: A

KA # & KA VALUE: 217000 2.2.36 (Reactor Core Isolation Cooling System) Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations. (3.1 / 4.2) 55.43.2

REFERENCE: TS 3.5.1, TS 3.5.3, SD000180 pages 33 and 34

SOURCE: New

LO: 10305 With Tech Spec provided, determine LCO applicability for a given mode of operation.

RATING: H3

ATTACHMENT: TS pages 3.5.1-1, 2 and 3; TS pages 3.5.3-1

JUSTIFICATION: The loss of MC-S2-1A renders the RCIC system inoperable. Per TS 3.5.3, when RCIC is inoperable, verify HPCS operable. HPCS is inoperable per question which makes 3.5.3B required – A is correct. D is answer per TS 3.5.1 but is not as limiting as 3.5.3. B is the remainder of the original HPCS TS. C is TS 3.0.3 requirements.

A Temporary Modification Request (TMR) has been initiated and reviewed.

After which of the following approvals is the Temporary Modification allowed to be installed?

A. Craft Supervisor

B. CRS/Shift Manager

C. Design Engineering Supervisor

D. Plant Operations Committee (POC)

ANSWER: B

KA # & KA VALUE: 2.2.11 Knowledge of the process for controlling temporary design changes (2.3 / 3.3) 55.43.3

REFERENCE: PPM 1.3.9 page 39

SOURCE: New

LO: 8627 With procedures available, determine the required action for approval of a TMR (SRO Only)

RATING: L2

ATTACHMENT: None

JUSTIFICATION: Per PPM 1.3.9 TMR, the final installation approval signature is by the CRS/Shift Manager – B is correct.

During a refueling outage, in MODE 5, after a full core verification and while checking the operability of the “One-Rod-Out Interlock”, with a control rod withdrawn, the operating CRD pump trips and the standby CRD pump will not start. It has been determined that CRD charging water header pressure cannot be restored. Scram accumulator pressure for the withdrawn control rod is reported to be 920 psig.

Which of the following is correct?

A. Enter ABN-ROD. Per Tech Specs, insert a manual scram signal by depressing the four manual scram pushbuttons on P603.

B. Enter ABN-CRD. Per Tech Specs, immediately initiate actions to fully insert the inoperable withdrawn control rod.

C. Enter ABN-ROD. Per Tech Specs, immediately initiate actions to insert the control rod which is accomplished by directing the CRO to insert the rod utilizing the CONTINUOUS INSERT pushbutton.

D. Enter ABN-CRD. Per Tech Specs, immediately suspend control rod withdrawal and immediately initiate actions to insert the rod if it is in core cell with one or more fuel assemblies.

ANSWER: B

KA # & KA VALUE: 295022 AA2.01 Ability to determine and/or interpret the following as they apply to Loss of CRD Pumps: Accumulator Pressure (3.5 / 3.6) 55.43.2 and 55.43.5 and 55.43.7

REFERENCE: ABN-CRD page 3 and 5; TS 3.9.2-1, TS 3.9.5-1 and Bases page B 3.9.5-2;

SOURCE: New

LO: 6700 Evaluate conditions for entry into ABN-CRD; 10305 With Tech Spec provided, determine LCO applicability for a given mode of operation.

RATING: H2

ATTACHMENT: Yes – TS 3.9.2-1, 3.9.5-1

JUSTIFICATION: ABN-CRD is entered – A and C are incorrect; Accumulator pressure LT 940 psig renders the rod inoperable. TS requires rod to be inserted – B is correct, D is incorrect and is TS for 3.9.2.

QUESTION # 11 OCTOBER 2009

Columbia was in MODE 1 when a scram occurred on high drywell pressure caused by a small RRC leak in the drywell.

Additionally, the following post-scram conditions are observed:

APRM downscale lights are illuminated
3 control rods do not have their 'Full-In' green light illuminated
RPV level is –15 inches and up slow
RB Differential Pressure is –0.25 in. of water

Which of the following choices indicate all of the EOPs that are entered to mitigate the effects of these plant indications?

A. Only PPM 5.1.1, RPV Control and PPM 5.2.1, Primary Containment Control.

B. PPM 5.1.1, RPV Control, PPM 5.1.2, RPV Control ATWS, and PPM 5.2.1, Primary Containment Control.

C. PPM 5.1.1, RPV Control, PPM 5.2.1, Primary Containment Control, and entry into PPM 5.1.2, RPV Control ATWS, may be required.

D. PPM 5.1.2, RPV Control ATWS, PPM 5.2.1, Primary Containment Control, and PPM 5.3.1, Secondary Containment Control.

ANSWER: C

KA # & KA VALUE: 295015 AA2.02Ability to determine and/or interpret the following as they apply to Incomplete Scram: Control Rod Position (4.1 / 4.2) 55.43.5

REFERENCE: PPM 5.0.10 pages 100, 140, 143, 252, and 300

SOURCE: New

LO: 8017 Given plant conditions, recognize an EOP entry condition and enter the appropriate flow chart. 7784 Given a list, identify the criteria that must be met to ensure that the existing rod pattern alone can always assure reactor shutdown.

RATING: H3

ATTACHMENT: None

JUSTIFICATION: Entries into PPM 5.1.1 and PPM 5.2.1 are given in stem. PPM 5.1.2 may be entered depending on the 3 control rods position A and B are incorrect and C is correct. No entry into 5.3.1 is given – D is incorrect.

QUESTION # 12 OCTOBER 2009

A offsite release is in progress. The Incident Advisor has just completed an Offsite Dose Calculation.

Which of the following readings would require you to enter PPM 5.4.1, Radioactivity Release Control?

A. A TEDE rate of 15.2 mrem/hr at the Exclusion Area Boundary.

B. A CDE Thyroid Rate of 505 mrem/hr at the Protected Area Boundary.

C. A CDE Thyroid Rate of 55 mrem/hr at the Owner Controlled Area Boundary.

D. A TEDE Rate of 110 mrem/hr at the Industrial Development Complex Boundary.

ANSWER: A

KA # & KA VALUE: 295038 EA2.01 Ability to determine and/or interpret the following as they apply to High Off-site Release Rate: Off-site (3.3 / 4.3) 55.43.4

REFERENCE: PPM 13.1.1 Table 4, PPM 5.4.1 Entry Conditions

SOURCE: New

LO: 6131 With procedures available for reference and plant conditions such that an emergency classification should be declared, correctly classify the event.

RATING: H2

ATTACHMENT: Yes: PPM 13.1.1 Table 4 with the 1.2 miles removed from table identification.

JUSTIFICATION: Entry into PPM 5.4.1 is radiation reading GT Alert levels of table 4 at the Exclusion Area Boundary which is 1.2 miles. The only reading GT Alert at 1.2 miles is TEDE Rate of 15.2 mrem/hr. The remainder of the choices are GT the Alert reading but are within the 1.2 mile radius boundary. A is correct.

QUESTION # 13 OCTOBER 2009

Columbia is starting up following a refueling outage. Reactor power is currently 7 percent and the MODE switch is in the START/HOT STBY position. During post maintenance testing earlier in the shift, APRM A was bypassed on H13-P603 due to a faulty power supply drawer. I&C has just reported that, during surveillance testing, when the APRM MODE switch for APRM E was taken out of the OPERATE position, APRM E did not trip as required.

Which of the following describes any required actions?

A. Place the channel in one trip system in trip within 6 hours or place one trip system in trip within 6 hours.

B. Place the channel in trip within 12 hours or place the associated trip system in trip within 12 hours.

C. Be in MODE 2 within 6 hours.

D. Be in MODE 3 within 12 hours.

ANSWER: B

KA # & KA VALUE: 215005 2.2.21 APRM/LPRM System Knowledge of pre and post maintenance operability requirements (2.9 / 4.1) 55.43.2

REFERENCE: TS 3.3.1.1

SOURCE: New

LO: 9569 Given appropriate conditions, indications, and Tech Specs, interpret required TS actions from an analysis of plant conditions.

RATING: H3

ATTACHMENT: YES - TS 3.3.1.1–1 and –2 and Table 3.3.1.1-1

JUSTIFICATION: Two channels for the APRM inop trip are required in MODE 2 per TS Table 3.3.1.1-1 function 2d. With a separate entry allowed for each entry, Condition A is entered first and requires answer B be performed. If completion time for Condition A is not met, Condition D requires the condition referenced in Table 3.3.1.1-1 be entered which is G and it requires MODE 3 in 12 hours. A is incorrect as it is the LCO for one function in BOTH trip systems. C is incorrect per TS requirement. D is incorrect because it does not take into account entering condition A the second time.

QUESTION # 14 OCTOBER 2009

After a record breaking run followed by a scram, Columbia is starting up a day later. Reactor power is 20% when a transient occurs resulting in another Reactor scram. All systems performed as designed. The only operator actions that have been taken are the immediate scram actions per PPM 3.3.1. Two minutes later the following conditions exist:

RPV Level is +50 inches
RPV Pressure is cycling at approximately 1091 psig
High Pressure Core Spray is not operating

Which of the following caused the Reactor scram and which procedure should be entered to mitigate the effects of the transient?

A. A Differential Current lockout on the Main Generator coincident with a lockout of the Startup transformer. Enter PPM 5.1.1, RPV Control PPM 5.2.1 Primary Containment Control, and ABN-GENERATOR.

B. A coincidental opening of the N1-1 and the N1-2 breakers. Enter PPM 5.1.1, RPV Control and ABN-ELEC-SM1/SM7 and ABN-ELEC-SM2/SM4.

C. A loss of power to SM-8 coincident with an INOP trip of APRM C. Enter PPM 5.1.1, RPV Control and ABN-ELEC-SM3/SM8.

D. A coincident opening of the 1-7 breaker and the 3-8 breakers. Enter PPM 5.1.1, RPV Control and ABN-RPS.

ANSWER: D

KA # & KA VALUE:	295006 AA2.06 Ability to determine and/or interpret the following as they apply to SCRAM: Cause of the reactor scram (3.5 / 3.8) 55.43.5
REFERENCE:	Simulator; PPM 5.1.1 for entry conditions; ABN-RPS entry conditions
SOURCE:	New
LO:	7682 Describe the physical connection and/or cause and effect relationship between RPS and the MSIVs.
RATING:	H3
ATTACHMENT:	None
JUSTIFICATION:	Conditions in the stem indicate MSIVs are closed. C does not result in MSIV closure and is incorrect. For A or B to be correct you assume there is a total loss of feed (at this power) which would allow level to drop to –50”. But at that level HPCS initiates, so A and B are incorrect. D results in a loss of both RPS busses, a scram and MSIV closure - D is correct

QUESTION # 15 OCTOBER 2009

The plant is operating in MODE 4 and preparations are being made to de-tension the RPV Head and start refueling operations. There are no special tests in progress. RHR-P-2A has just been placed in Shutdown Cooling mode of operation. RPV Level is currently 36”. RRC-P-1B is operating at 15 Hz. A loss of SW-P-1A occurs.

Which of the following is correct?

A. Enter ABN-RHR-SDC-ALT. Raise RPV level to +60 inches prior to RPV temperature reaching 212°F.

B. Enter ABN-RHR-SDC-LOSS. Establish Primary Containment operability within 1 hour after RPV temperature reaches 200°F.

C. Enter ABN-RHR-SDC-ALT prior to exceeding 200°F. If RPV temperature is expected to exceed 212°F, RPV Head closure bolt detentioning is not permitted.

D. Enter ABN-RHR-SDC-LOSS. Establish Primary and Secondary Containment operability prior to RPV temperature reaching 200°F.

ANSWER: D

KA # & KA VALUE: 295021 2.4.9 Loss of Shutdown Cooling. Knowledge of low power / shutdown implications in accident (e.g. loss of coolant accident or loss of Residual Heat Removal) mitigation strategies (3.8 / 4.2) 55.43.5 and 55.43.2

REFERENCE: TS Table 1.1-1 TS page 3.6.1.1-1 and 3.6.4.1-1; TS 3.0.4

SOURCE: New

LO: 9670 Given appropriate conditions, indications and copies if TS, determine when an entry condition is met and interpret required TS actions from an analysis of plant conditions.

RATING: H2

ATTACHMENT: TS page 3.6.4.1-1 (Secondary Containment); 3.6.1.1 -1 (Primary Containment)

JUSTIFICATION: When RPV/T reaches 200°F, a MODE change to MODE 3 occurs. TS 3.0.4 requires conditions to be satisfied prior to mode change. PC and SC is required to be established prior to 200 degrees – D is correct. B is incorrect as mode change must be before 200 is reached. A is incorrect as RRC-P-1B is in operation. C is incorrect as no correlation exists between RPV temp and head closure bolt detensioning.

QUESTION # 16 OCTOBER 2009

Columbia has just started pulling control rods following a refueling outage. OPS2 reports that the feeder breaker to E-CO-1A and E-CO-1B on PP-7A has tripped open.

Which of the following is correct?

A. Restore battery voltage to $\geq$ 26.0 V in 2 hours, verify float current $\leq$ 0.2 amps and restore required battery charger to operable status within 72 hours.

B. Restore the required battery charger to operable status within 2 hours or immediately declare the required supported equipment inoperable.

C. Restore the required SRMs to operable status within 4 hours.

D. Fully insert all insertable control rods within 1 hour and place the reactor mode switch in the shutdown position within 1 hour.

ANSWER: A

KA # & KA VALUE: 295004 AA2.02 Ability to determine and/or interpret the following as they apply to partial or Complete Loss of DC Power: Extent of partial or complete loss of D.C. power (3.5 / 3.9) 55.43.5 and 55.43.2

REFERENCE: LCS 1.8.4 –1 and B 1.8.4-4, 3.3.1.2-1 and –3; TS page 3.0-5 for 3.0.6 criteria

SOURCE: New

LO: 5264 Given a list of loads identify its relationship to 24 VDC system. 9670 Given appropriate conditions, indications and copies if TS, determine when an entry condition is met and interpret required TS actions from an analysis of plant conditions.

RATING: H3

ATTACHMENT: LCS 1.8.4-1 and –2; ; TS 3.3.1.2-1, -2, and -6

JUSTIFICATION: The feeder breaker feeds E-CO-1A and 1B is only for the Division 1 SRMs. A is correct as LCS 1.8.4 bases requires subsystem to be operable when supported equipment is required to be operable. TS 3.0.6 does not allow cascading Tech Specs which makes choice C and D incorrect (C is TS for SRMs in MODE 2 and D is TS for SRMs in MODE 3 or 4). B is incorrect as it is battery LCS when required compensatory measure time not met.

QUESTION # 17 OCTOBER 2009

A plant startup is in progress. Noble metal addition is in progress. Hydrogen Water Chemistry System is not in service . Twelve (12) hours ago Reactor Coolant temperature was raised to GT 200°F. The startup has been placed on hold with reactor power at 7% due to a problem with the nitrogen inerting skid. Estimates are that the nitrogen skid repairs will be completed in twenty-six (26) hours.

Chemistry has just informed you that reactor water conductivity is 6.0 uS/cm.

Which of the following is correct?

A. There are no actions or corrective actions that need to be taken at this time.

B. If reactor water conductivity levels do not drop in three hours, commence a controlled reactor shutdown per PPM 3.2.1.

C. If reactor water conductivity levels do not drop in three hours, insert a manual scram per PPM 3.3.1.

D. If reactor water conductivity levels do not drop in twelve hours, insert a manual scram per PPM 3.3.1.

ANSWER: A

KA # & KA VALUE: 2.1.34 Knowledge of the primary and secondary plant chemistry limits (2.7 / 3.5) 55.43.5

REFERENCE: SWP-CHE-02 Pages 5, 6, 8, and 12

SOURCE: New

LO: 11159 Given plant conditions associated with ABN-CHEM, determine if a reactor scram is required.

RATING: H3

ATTACHMENT: SWP-CHE-02 pages 1 and 4 thru 8 and 12

JUSTIFICATION: Per CHEM-02 table 6.2b note a, conductivity is expected to exceed level 2 and 3 limits during noble metal addition and no actions are required – A is correct.

QUESTION # 18 OCTOBER 2009

Columbia is operating at 72% power. The last performance of the weekly RPS Manual Scram Channel Functional Test surveillance was completed at 1200 on October 21st. It was discovered at 1000 on October 30th that the next performance of this surveillance had not yet been performed.

Select the statement below which correctly describes the actions which must be taken based due to the above condition?

A. Manage the risk impact and complete the missed surveillance by 1000 on November 6th.

B. The missed surveillance must be completed by 0600 on October 30th or be in MODE 3 within 12 hours.

C. The completion of the surveillance, if started immediately, will still be within the technical specification time requirements.

D. The missed surveillance has resulted in a Technical Specification required shutdown. Be in MODE 3 within 12 hours from the time of discovery.

ANSWER: A

KA # & KA VALUE: 212000 A2.03 Ability to (a) predict the impacts of the following on the Reactor Protection System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Surveillance testing (3.3 / 3.5) 55.43.2

REFERENCE: TS 3.3.1.1; table 3.3.1.1-1 and SR 3.0.2, SR 3.0.3

SOURCE: Bank (modified slightly) – LO01654

LO: 10301 With TS provided, determine the allowable Completion Time extension

RATING: H3

ATTACHMENT: TS pages 3.3.1.1 all pages; TS table 3.3.1.1-1

JUSTIFICATION: The missed surveillance is SR 3.3.1.1.4 which has a 7 day frequency. SR 3.0.2 allows 1.25 times 7 days from the last performance which would be 0600 on Oct. 30 (8 days and 18 hours) – surveillance is late – C is incorrect; B is based on the 24 hours from recognition of a missed surveillance and is incorrect because if the risk is managed the surveillance can go longer than Oct. 31st – B is incorrect; D is incorrect as it does not take into account TS 3.0.3.; A is correct per SR 3.0.3 which allows 24 hours or surveillance frequency if an risk impact is performed.

Columbia is operating in MODE 2 following a refueling outage. During the outage, work was performed WMA-FN-54A and WMA-FN-54B. Surveillance OSP-WMA-B703 and OSP-WMA-B704 are being performed. Electricians have just informed the Control Room Supervisor that calculated heater power from Attachment 9.1 on WMA-FN-54A's emergency heater was calculated to be 5.7 KW and the calculated heater power from Attachment 9.1 on WMA-FN-54B's emergency heater was calculated to be 5.9 KW.

Based on the above which of the following is correct?

A. Restore WMA-FN-54A to operable status within 7 days or be in MODE 3 in 12 hours and MODE 4 in 36 hours.

B. Immediately place both WMA-FN-54A and WMA-FN-54B in the pressurization mode of operation.

C. Restore WMA-FN-54B to operable status within 7 days or be in MODE 3 in 12 hours and MODE 4 in 36 hours.

D. Within 1 hour initiate actions to be in MODE 3 within 13 hours and MODE 4 within 37 hours.

ANSWER: D

KA # & KA VALUE:	290003 2.1.7 Control Room HVAC Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. (4.4 / 4.7) 55.43.2
REFERENCE:	TS 3.0.3; OSP-WMA-B703 and B704 surveillance; TS 3.7.3
SOURCE:	New
LO:	9670 Given appropriate conditions, indications and copies if TS, determine when an entry condition is met and interpret required TS actions from an analysis of plant conditions.
RATING:	H2
ATTACHMENT:	TS 3.7.3 all pages, OSP-WMA-B703 and B704 pages 1 and 7
JUSTIFICATION:	Heater power results are out of spec per OSP-WMA-B703 and B704. TS 3.7.3 for two CREF subsystems inoperable in MODE 1, 2, 3 for reasons other than B – Enter TS 3.0.3 immediately – D is correct. Other choices are from TS 3.7.3 for other conditions.

QUESTION # 20 OCTOBER 2009

Columbia has experienced a series of events that have resulted in the following plant conditions:

RPV Level is –36 inches and trending up
Drywell Pressure is 4 psig and steady
RHR-A is running on min flow
RHR-B is operating in Suppression Pool Cooling

Which of the following is correct?

A. Initiate Drywell sprays after Drywell Temperature reaches 285°F but before Drywell Temperature reaches 330°F utilizing RHR A.

B. Initiate Drywell sprays after Drywell Temperature reaches 285°F utilizing RHR A and before Drywell Temperature reaches 330° with RHR B.

C. Initiate Drywell sprays after Drywell Temperature reaches 285°F utilizing RHR A and after Drywell Temperature reaches 330° with RHR B.

D. When Drywell Temperature reaches 330°F, re-enter PPM 5.1.1 and initiate an Emergency Depressurization.

ANSWER: D

KA # & KA VALUE: 226001 A2.17Ability to (a) predict the impacts of the following on the RHR/LPCI Containment Spray System Mode; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High containment / drywell temperature (3.2 / 3.2) 55.43.5

REFERENCE: PPM 5.0.10; PPM 5.2.1 DW Temp blocks DT-3 to end and OI-15 page 12

SOURCE: New

LO: 8433 Given plant conditions and the DSIL curve, determine weather or not drywell sprays may be initiated.

RATING: H3

ATTACHMENT: DSIL Curve and PPM 5.2.1 DW Temperature leg blocks DT-3 to end

JUSTIFICATION: The parameters given are in the prohibited region of the DSIL curve and DW sprays should not be initiated – D is correct. All other answers are incorrect.

QUESTION # 21 OCTOBER 2009

With Columbia operating at rated power, CRO2 responds to a CIA AIR RECEIVER PRESS LOW alarm (4.840.A5 4-3).

Which of the following is correct?

A. If CIA header pressure degrades further, loss of SRV Solenoid ‘C’ control for all SRVs may occur. Enter ABN-CIA and direct installation of ADS solenoid keys on H13-P628 and P631.

B. If CIA header pressure degrades further, loss of SRV Solenoid ‘C’ control affecting only the ADS SRVs may occur. Enter ABN-CIA and direct installation of ADS solenoid keys on H13-P628 and P631.

C. If CIA header pressure degrades further, loss of SRV Solenoid ‘A’ for Division 1 ADS SRVs and SRV Solenoid ‘B’ for Division 2 ADS SRVs may occur. Enter ABN-ADS and direct cross-connecting of CAS to CIA.

D. If CIA header pressure degrades further, loss of SRV Solenoid ‘A’ for all Division 1 SRVs and SRV Solenoid ‘B’ for all Division 2 SRVs may occur. Enter ABN-ADS and direct cross-connecting of CAS to CIA.

ANSWER: A

KA # & KA VALUE: 218000 A2.03 17Ability to (a) predict the impacts of the following on the Automatic Depressurization System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of air supply to ADS valves (3.4 / 3.6) 55.43.5

REFERENCE: 4.840.A5 4-3 ARP; ABN-CIA

SOURCE: New

LO: 10337 Given annunciation and indications, evaluate conditions for entry into ABN-CIA.

RATING: H2

ATTACHMENT: None

JUSTIFICATION: A loss of CIA pressure affects the C solenoid of all SRVs. ABN-CIA is entered and directs installation of keys for ADS SRVs in backpanel P628 and P631 – A is correct.

During a river discharge from FDR-TK-9, CRO2 responds to annunciator 4.602.A5 drop 6-6, RADWASTE EFFLUENT RAD MONITOR DNSCL OR INOP. The RWCR operator checks and verifies FDR-RIS-606 has failed downscale.

Concerning the river discharge, which of the following is correct?

A. The CRS/Shift Manager approved the river discharge. With FDR-RIS-606 failed downscale, the river discharge is stopped immediately and can not be continued until FDR-RIS-606 is operational. PPM 13.1.1 should be monitored for EAL threshold limits.

B. The CRS/Shift Manager approved the river discharge. Immediately stop the release. Perform SR 6.2.1.1.1 on independent two samples and verify release calculations and discharge lineup using two qualified members of the technical staff prior to re-commencing the release.

C. The Chemistry Manager approved the river discharge. With FDR-RIS-606 failed downscale, the river discharge is stopped immediately and can not be continued until FDR-RIS-606 is operational. PPM 13.1.1 should be monitored for EAL threshold limits.

D. The Chemistry Manager approved the river discharge. Immediately stop the release. Perform SR 6.2.1.1.1 on two independent samples and verify release calculations and discharge lineup using two qualified members of the technical staff prior to re-commencing the release.

ANSWER: B

KA # & KA VALUE: 2.3.6 Ability to approve release permits. (2.0 / 3.8) 55.43.4

REFERENCE: PPM 16.10.1 page 1; 4.602.A58 6-6; ODCM RFO 6.1.1.1 pages -1, -2 and -4

SOURCE: New

LO: None

RATING: H3

ATTACHMENT: ODCM 6.1.1.1-1 and -4

JUSTIFICATION: The River Discharge is approved by the SM/CRS. ODCM requirement for FDR-RIS-606 inop/downscale is to immediately stop the release and perform SR 6.2.1.1.1 on independent two samples and verify release calculations and discharge lineup using two qualified members of the technical staff prior to re-commencing the release. B is correct.

A series of events has resulted in the following scenario:

A situation has arose that requires a task to be performed in the Reactor Building that will protect some very expensive equipment. An individual has volunteered to perform the task.

At what classification are Energy Northwest's administrative exposure hold points waived and, as the Emergency Director, what is the maximum dose you are authorized to allow the individual to receive?

A. Unusual Event; 5 rem TEDE

B. Alert; 10 rem TEDE

C. Alert; 25 rem TEDE

D. Site Area Emergency; 50 rem TEDE

ANSWER: B

KA # & KA VALUE: 2.3.4 Knowledge of the radiation exposure limits under normal and emergency conditions (3.2 / 3.7) 55.43.4

REFERENCE: PPM 13.2.1 Pages 3, 4, 5, and 6

SOURCE: New

LO: 6020 State who approves exposures above 10CFR 20 limits; 6019 State at which classification level exposure hold points are waived.

RATING: L2

ATTACHMENT: None

JUSTIFICATION: A is incorrect as it is the normal federal limit; C is incorrect as it is the dose for life-saving or protection of large populations. D is incorrect as it is the total organ dose equivalent (TODE). The federal limit for protecting valuable property is 10 rem – B is correct

QUESTION # 24 OCTOBER 2009

A unexpected half scram is received on the RPS A System. CRO1 scans the full core display and notes that control rod 46-35 has its blue scram light and its green full in light illuminated.

Which of the following correctly identifies the 'classification' of the control rod and also correctly identifies the procedures used to mitigate the resultant consequences?

The control rod is considered…….

A. just a 'scrammed control rod'. Entry into ABN-POWER and ABN-RPS is made.

B. just a 'mispositioned control rod'. Entry into ABN-ROD and ABN-RPS is made.

C. a 'scrammed control rod' and a 'mispositioned control rod'. Entry into ABN-ROD and ABN-RPS is made.

D. a 'scrammed control rod' and a 'mispositioned control rod'. Entry into ABN-POWER and ABN-RPS is made.

ANSWER: C

KA # & KA VALUE: 2.1.37 Knowledge of procedures, guidelines, or limitations associated with reactivity management (4.3 / 4.6) 55.43.6

REFERENCE: SWP-RXE-01 page 27, ABN-ROD pg 2 and 21

SOURCE: New

LO: 6739 Define a mispositioned control rod.

RATING: L3

ATTACHMENT: None

JUSTIFICATION: SWP-RXE-01 defines a mispositioned control rod as 'a control rod not in its intended position due to mechanical problems (low air pressure, blown fuses, etc) making the rod a mispositioned rod and a scrammed rod - A and B are incorrect. Entry into ABN-ROD and ABN-RPS is made – C is correct. ABN-POWER is not entered – D is incorrect.

BPA has contacted Columbia and requested a reduction in power to 85% for economic dispatch. During the downpower, a loss of the annunciators associated with H13-P601, H13-P602 and H13-P603 occurs. H13-P603.A7-1.1 'ANNUNCIATOR 125 VDC LOSS' is illuminated.

Which of the following is correct?

A. The required Reactor scram is made promptly and a continuous walk down of all plant parameters on H13-P601, P602 and P603 must be started. All operations not essential to safe plant operations and surveillance testing must be stopped. An Unusual Event is declared immediately.

B. The required controlled plant shutdown may commence immediately. A continuous walk down of H13-P601, P602 and P603 of scram parameters shall be performed during the plant shutdown. An Unusual Event is declared after 15 minutes if annunciation is not restored.

C. The plant downpower is stopped. An Unusual Event is declared after 15 minutes if annunciation is not restored. Continuously monitor non-annunciated plant and scram parameters on H13-P601, P602 and P603.

D. The plant downpower is stopped. An Unusual Event is not declared as annunciation on Bd. C is still active. Continuously monitor non-annunciated plant and scram parameters on H13-P601, P602 and P603.

ANSWER: C

KA # & KA VALUE:	2.4.32 Knowledge of operator response to loss of all annunciators (3.6 / 4.0) 55.43.5
REFERENCE:	ABN-ANNUN Page 2 and 3; 4.P603.A7-1.1; PPM 13.1.1A page 122 (7.3.U.1 bases); OI-15 page 25
SOURCE:	Bank – March 2009 NRC Exam
LO:	9972 Describe the actions required to be performed promptly for a Loss of Control Room Annunciators and discuss the desired effect these actions will have.
RATING:	L2
ATTACHMENT:	Yes – 13.1.1 Att. 5.1 - box for 7.3.U.1 (UE associated with loss of annunciation)
JUSTIFICATION:	There is no 'required' scram or shutdown (A and B are incorrect); Even though the UE (7.3.U.1) also includes Bd C, having the annunciators still active on that panel does not preclude the UE declaration. The Bases for this classification states a judgment call should be made by the ED with about 75% being the threshold. Additionally, the ARP for P603.A7-1.1 'ANNUNCIATOR 125 VDC LOSS' requires PPM 13.1.1 be referenced for classification. An Unusual Event is required but 15 minutes is waited (A and D are incorrect). C is correct.