

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #1

EXAM KEY

03/27/2003

EX03001

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According to PPM 5.0.10 Flowchart Training Manual, which of the following is a possible cause of fuel damage during an ATWS?

- A. Lowering reactor level to –65 inches.
- B. Rapid injection of water.
- C. Moderator temperature decrease exceeding 100°F/hour.
- D. Loss of forced core flow.

ANSWER: B

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QUESTION TYPE: SRO/RO

KA # & KA VALUE: 295015AK1.03 3.8/3.9 10CFR55.41 - Knowledge of the operational implications of the following concepts as they apply to INCOMPLETE SCRAM: reactivity affects.

REFERENCE: PPM 5.0.10 rev. 6, page 71

SOURCE: **BANK QUESTION – MODIFIED – EX02039 2002 NRC EXAM – RO T1, GP1, #6**

LO: 8499 – Given a list, identify the statement that describes the plant response to rapid injection of water into the RPV during an ATWS.

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: PPM 5.0.10 states that rapid injection into the core during ATWS conditions may result in a large increase in reactivity large enough to cause fuel damage. B is the only correct answer.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #2

EXAM KEY

03/27/2003

EX03002

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The plant was operating at 100% power when an Operating Basis Earthquake caused a leak in the Suppression pool and an isolated ATWS. Suppression pool level is 13.8 feet and going down.

Which of the following is correct concerning these conditions?

- A. A large LOCA would result in exceeding code allowable stresses in the drywell floor downcomers.
- B. A large LOCA would result in exceeding the drywell floor Differential Pressure Limit.
- C. SRV discharge would result in exceeding code allowable stresses in the tail pipe, tail pipe supports, quenchers, or quencher supports.
- D. SRV discharge would bypass the pressure suppression function of the Containment.

ANSWER: D

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QUESTION TYPE: SRO/RO

KA # & KA VALUE: 295030EK2.08 3.5/3.8 10 CFR55.41 & 45 – Knowledge of the interrelations between Low Suppression Pool Water Level and the SRV discharge submergence.

REFERENCE: PPM 5.0.10, rev 6, pages 91 & 92

SOURCE: **BANK QUESTITON – Ex98008 98 NRC EXAM**

RO T1, GP2, #13

LO: 8055 Given a list, identify the statement that describes the primary containment response to opening SRVs if wetwell level is below 17 feet.

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: A is incorrect because a large LOCA does not exceed the “code allowable stresses” in the drywell floor downcomers. B is incorrect because the Suppression Chamber to Drywell vacuum breakers will maintain .5 pound dp. C is incorrect because it is a high level in the SP that is the cause of this failure.

COMMENTS: Changed designation to BANK (slightly modified stem)

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #3

EXAM KEY

03/27/2003

EX03003

The plant was operating at 99% power when a Main Turbine trip caused a scram. All plant equipment operated as designed. The following conditions exist:

Reactor Pressure = 950 psig  
Reactor Level = +19 inches  
Drywell Pressure = .016 psig  
Drywell Temperature = 137°F  
Wetwell Temperature = 78°F  
Wetwell Level = +.2 inches

Which of the following is correct for these conditions?

- A. Operate available drywell cooling.
- B. Start RHR-P-2C in Suppression Pool Cooling.
- C. Increase reactor level to the band of +60 inches to +80 inches to ensure adequate core flow.
- D. Reduce reactor pressure to less than 300 psig to allow the Condensate pumps to inject for level control.

ANSWER: A

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QUESTION TYPE: SRO/RO

KA # & KA VALUE: 295012AA1.01 3.5/3.6 10CFR55.41 & 45 Ability to operate and/or monitor the following as they apply to High Drywell Temperature: Drywell ventilation system.

REFERENCE: PPM 5.0.10 rev 6, pg. 251

SOURCE: **NEW QUESTION** - RO T1, GR2, #5

LO: 8017 Given plant conditions, recognize an EOP entry conditions and enter the appropriate flow char.

RATING: H3

ATTACHMENT: NONE

COMMENTS:

JUSTIFICATION: B is incorrect because there is no Suppression Pool Cooling mode for RHR-P-2C. C is incorrect because both RRC Pumps are still in operation under these conditions. D is incorrect because this would cause a cooldown in excess of 100°F/hr. A is correct as stated in PPM 5.0.10.

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #4

EXAM KEY

03/27/2003

EX03078

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The reactor is operating at 98% power when the Control Room receives several Reactor Building Fire alarms. Shortly thereafter, equipment in areas below the fire loses power.

Which of the following is the cause of the electrical problems?

- A. Automatic load shedding of equipment associated with the fire alarm.
- B. Cascading fire suppression water entering switchgears/equipment.
- C. Security guards are exercising their portion of the plant's fire plans.
- D. Plant equipment is tripping due to high area temperatures.

ANSWER: B

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QUESTION TYPE: RO/SRO

KA # & KA VALUE: 600000AK3.04 2.8/3.4 - Knowledge of the reasons for the following responses as they apply to PLANT FIRE ON SITE: actions contained in the abnormal procedures for plant fire on site.

REFERENCE: ABN-FIRE rev. 4, page 12

SOURCE: NEW QUESTION – RO T1, GP2, #18

LO: NONE

RATING: H2

ATTACHMENT: NONE

JUSTIFICATION: A is incorrect because there is no automatic load shedding associated with fire alarms. C is incorrect because Security does not operate plant equipment for their actions in the fire plans. D is incorrect because equipment does not have high area temperature trips associated with them. B is correct as stated in the reference.

COMMENTS: Replaced question due to duplication with knowledge of Q#78.

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #5

EXAM KEY

03/27/2003

EX03004

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A plant startup is in progress with power at 0.2% and increasing. A ½ scram is in on RPS B due to maintenance activities. A range switch has failed causing IRM G to remain on Range 4. The failure goes unnoticed. All other plant systems operate as designed.

Which of the following is correct for these conditions?

- A. The startup continues after the rod block is reset.
- B. The power increase stops when the rod block is received.
- C. Enter PPM 3.3.1 Reactor Scram
- D. Enter PPM 5.1.2 RPV Control ATWS.

ANSWER: C

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QUESTION TYPE: RO/SRO

KA # & KA VALUE: 215003A2.06 3.0/3.2 10CFR55.41 & 45 Ability to predict the impacts of the following on the IRM System and based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions.

REFERENCE: SD000138 IRM rev. 8, page17

SOURCE: **NEW QUESTION – RO T2, GP1, #8**

LO: 5459 List the IRM scrams and rod blocks with setpoints and bypass conditions.

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: With the conditions given, power continues to increase with no rod motion. It increases to the scram setpoint on IRMG, A and B are incorrect. When the scram setpoint is reached a ½ scram on RPS A is generated and all control rods insert, D is incorrect. PPM 3.3.1 is entered. C is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #6

EXAM KEY

03/27/2003

EX02030

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What is the purpose of sequencing loads on DG-1 and 2?

- A. Prevents the possibility of over speeding the diesel.
- B. Prevents a generator loss of excitation trip.
- C. Reduces the impact of the automatically connected loads.
- D. Reduces the tendency for the diesel engine to run under "souping" conditions.

ANSWER: C

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QUESTION TYPE: SRO/RO

KA # & KA VALUE: 264000K5.06 3.4/3.4 10CFR55.41 & 45 - Knowledge of the operational implications of the following concepts as they apply to EMERGENCY GENERATORS (DIESEL/JET): Load sequencing

REFERENCE: LO000200 rev. 8, pages 40

SOURCE: **BANK QUESTION – 2002 NRC EXAM EX02030 – RO T2, GP1, #28**

LO: NO LO

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: A and B are both incorrect because load sequencing would have no effect on the possibility of over speeding the DG or preventing a loss of excitation trip. D is incorrect because souping is prevented by not operating the DG for long periods of time under lightly loaded conditions. C is correct as given in the systems text.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #7

EXAM KEY

03/27/2003

EX03005

The plant is operating at 100% power when RCC-RE-7 trips on High High Radiation at the suction of the RCC Pumps.

Which of the following is correct for this condition?

- A. RCC-V-101 RCC Surge Tank Vent closes.
- B. RCC-V-48 RCC Surge Tank Makeup Valve closes.
- C. RCC-V-5 Inboard Containment Isolation Valve closes.
- D. RCC-V-104 Outboard Containment Isolation Valve closes.

ANSWER: A

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QUESTION TYPE: RO/SRO

KA # & KA VALUE: 400000A3.01 3.0/3.0 10CFR55.41 & 45 Ability to monitor automatic operations of the CCWS including: Setpoints on instrument signal levels for normal operations, warnings, and trips that are applicable to CCWS.

REFERENCE: LO000196 RCC rev. 9 pages 6 and 7

SOURCE: **NEW QUESTION** – RO T2, GP2, #19

LO: 5709 Describe the automatic feature associated with RCC surge tank vent valve.

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: B is incorrect because the only auto feature for RCC-V-48 is Surge Tank Level. C and D are both incorrect because they close on an F or A signal. A is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #8

EXAM KEY

03/27/2003

EX03006

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The plant was operating at 78% power when a transient caused the drywell pressure to rise to 1.92 psig.

According to ABN-FAZ-QC, which of the following should have occurred?

- A. RRC-P-1A /1B trip.
- B. ROA-FN-1A/1B trip.
- C. MSIVs isolate.
- D. RWCU isolates.

ANSWER: B

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QUESTION TYPE: RO/SRO

KA # & KA VALUE: 288000A2.03 3.5/3.7 10CFR55.41 & 45 Ability to predict the impacts of the following on the Plant Ventilation Systems and based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions.

REFERENCE: ABN-FAZ-QC rev. 0

SOURCE: **NEW QUESTION – RO T2, GP3, #4**

LO: 6919 Given plant conditions associated with unplanned core operating conditions, determine if a reactor scram is required.

RATING: L3

ATTACHMENT: NONE

JUSTIFICATION: B is the only correct answer because a hi drywell pressure does not cause A, B, or C to occur.

COMMENTS:



# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #9

EXAM KEY

03/27/2003

EX00036

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The plant is in MODE 1 with the following conditions:

Reactor Pressure	951 psig
Reactor Power	15%
Turbine 1 <sup>st</sup> stage metal temp	176°F

The Shift Manager has given direction to roll the turbine.

Which of the following is the maximum roll rate for the main turbine under these conditions?

- A. 36 rpm/min
- B. 45 rpm/min
- C. 60 rpm/min
- D. 90 rpm/min

ANSWER: C

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QUESTION TYPE: SRO/RO  
KA # & KA VALUE: 2.1.25 2.8/3.1 10CFR55.41 & 43 Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data.  
REFERENCE: PPM 2.5.7 rev 40 page 119  
SOURCE: **BANK QUESTION – 2000 NRC EXAM EX00036 – RO T3, #1**  
LO: 6518 With procedures available and given HP turbine first stage metal temperature, determine the time required to roll from turning gear to rated speed and synchronize and load to 100%.  
RATING: H2  
ATTACHMENT: YES - PPM 2.5.7 rev 40 page 119  
JUSTIFICATION: The correct roll rate is determined by plotting up from 176°F to the roll line and across to the time line of 30 min. Dividing 1800 rpm by 30 gives the correct roll rate of 60 rpm/minute. The distracters are roll rates based on 20, 40, and 50 minute roll times and are incorrect.  
COMMENTS: Change the word correct to maximum in the question.

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #10

EXAM KEY

03/27/2003

EX03007

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The plant was operating at power when a series of events result in a scram. All control rods do not fully insert and reactor power is greater than 5%.

EOP 5.1.2 has been entered. The level leg directs that RPV level be maintained between -65" and -192".

What is the reason for lowering level to at least -65" in this condition?

- A. To increase core inlet subcooling.
- B. To increase the amount of natural circulation.
- C. To mitigate the consequences of any irregular neutron flux oscillations.
- D. To reduce water inventory thus increasing the concentration of boron when added.

ANSWER: C

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QUESTION TYPE: RO/SRO

KA # & KA VALUE: 2.4.18 2.7/3.6 10CFR55.41 & 45 Knowledge of specific bases for the EOPs.

REFERENCE: PPM 5.0.10 rev. 6, page 152

SOURCE: **NEW QUESTION – RO T3, #11**

LO: NO LO

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: A is incorrect because with spargers in the steam space, heating of the feedwater by contact with the steam reduces core inlet subcooling. B is incorrect because lowering level reduces natural circulation. While D is a correct statement it is not a basis for lowering level.

COMMENTS: New question acceptable

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #11

EXAM KEY

03/27/2003

EX00043

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The reactor was operating at 98% power when a transient occurred. Reactor power is unknown at this point.

Which of the following is correct concerning these conditions?

Positive confirmation that the reactor will remain shutdown under all conditions is obtained...

- A. on the RWM display panel.
- B. by all APRMs indicating < 5%.
- C. by 900 gallons of boron injected.
- D. all bypass valves closed with MSIVs open

ANSWER: A

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QUESTION TYPE: SRO/RO

KA # & KA VALUE: 295015AA2.02 4.1/4.2 10CFR55.41 & 43 Ability to determine and/or interpret the following as they apply to Incomplete Scram: Control Rod position.

REFERENCE: PPM 5.0.10 rev 6, page186

SOURCE: **BANK QUESTION – 2000 NRC EXAM EX00043 –**  
RO T1, GP1, #7

LO: 8182 Given a list, identify the criteria that must be met to ensure that the reactor is shutdown with no boron injected.

RATING: H2

ATTACHMENT: NONE

JUSTIFICATION: Confirmation of the reactor shutdown under all conditions can only be accomplished by confirmation of all rods (except 1) full in. The control room crew cannot evaluate this override by any other method without outside help. B, C, and D are all incorrect. None of them confirm the reactor is shutdown under all conditions. A is correct.

COMMENTS:

**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #12

EXAM KEY

03/27/2003

EX98009

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PPM 5.2.1 directs that Drywell Recirc fans be secured when H2 and O2 concentration exceeds limits.

Which of the following identifies the basis for this direction?

Drywell Recirc Fans are secured to .....

- A. eliminate a potential source of ignition.
- B. reduce mixing in the drywell of H2 and O2.
- C. reduce cooling to allow the CAC recombiners to operate more efficiently.
- D. prevent damage when wetwell sprays are started.

ANSWER: A

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QUESTION TYPE: SRO/RO

KA # & KA VALUE: 500000EK3.02 2.8/3.0 10CFR55.41 & 45

REFERENCE: PPM 5.0.10, rev 6, page 278

SOURCE: **BANK QUESTION – 1998 NRC EXAM EX98009**  
RO T1, G1, #13

LO: 8426 Given a list, identify the statement that describes the purpose of securing CAC and drywell recirculation fans if deflagration conditions exist.

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: B is incorrect because mixing is desirable with H2 and O2 present. C is incorrect because the recombiners need warm incoming gas to work efficiently. D, the SP spray has not effect on the operation of DW recirc fans.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #13

EXAM KEY

03/27/2003

EX03008

Reactor Building Ventilation was operating normally when an event occurred which caused the following indications:

ROA-FN-1A & 1B = OFF  
ROA-V-1 & 2 = OPEN  
REA-FN-1A & 1B = OFF  
REA-V-1 & 2 = OPEN

Which of the following caused these indications?

- A. Reactor level –75 inches.
- B. Drywell pressure 1.96 psig.
- C. Reactor building exhaust plenum 22 mr.
- D. Reactor building pressure 4.3 inches of water.

ANSWER: D

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QUESTION TYPE: RO/SRO  
KA # & KA VALUE: 295035EA1.01 3.6/3.6 10CFR55.41 & 45 Ability to operate and or monitor the following as they apply to Secondary Containment High Differential Pressure: Secondary Containment Ventilation System.  
REFERENCE: 82-RSY-1000-T6 RB HVAC rev. 8 pages 5, 10, 12, and 13  
SOURCE: **NEW QUESTION – RO T1, GP3, #3**  
LO: 5679 Describe the RB HVAC system response to an FAZ signal.  
RATING: H3  
ATTACHMENT: NONE  
JUSTIFICATION: All of these signals cause the reactor building fans to trip. A, B, and C also cause the valves to close. Only high pressure trips the fans, but leaves the valves open. D is correct.  
COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #14

EXAM KEY

03/27/2003

EX98096

With the plant operating at 99% power, a scram occurred on high neutron flux. The following conditions exist:

Reactor level	10 inches up slow
Reactor power	IRM range 3
Drywell pressure	1.5 psig up slow
Wetwell temperature	89°F steady
REA-RIS-609A-D	15 mr/hr
(Rx Bld Ex.)	

Which of the following describes the EOPs that should be entered at this time?

- A. PPM 5.2.1, Primary Containment Control and PPM 5.3.1 Secondary Containment Control
- B. PPM 5.1.1, RPV Control and PPM 5.3.1, Secondary Containment Control
- C. PPM 5.1.1, RPV Control and PPM 5.1.2, RPV Control ATWS
- D. PPM 5.1.2, RPV Control ATWS and PPM 5.3.1, Secondary Containment Control

ANSWER: B

QUESTION TYPE: SRO/RO

KA # & KA VALUE: 2.4.4 4.0/4.3 10CFR55.41, 43, & 45 Ability to recognize abnormal indications for system operating parameters which are entry level conditions for emergency and abnormal operating procedures.

REFERENCE: PPM 5.0.10 rev. 6, pages 103 & 284

SOURCE: **BANK QUESTION 1998 NRC EXAM EX98096**

RO T3, #12

LO: 8017 Given Plant conditions, recognize EOP entry conditions and enter the appropriate flow chart.

RATING: H2

ATTACHMENT: NONE

JUSTIFICATION: At this point the only EOPs that should be entered are 5.3.1 and 5.1.1, based on the given conditions. B is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #15

EXAM KEY

03/27/2003

EX03009

The plant is operating at 78% power following the receipt of several annunciators in the control room. CRO1 notices that the Scram Discharge Volume drain valve indication (CRD-V-11/CRD-V-181) indicates closed.

Which of the following caused these indications?

- A. ½ Scram on RPS A
- B. ½ Scram on RPS B
- C. Loss of RPS A
- D. Loss of RPS B

ANSWER: D

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QUESTION TYPE: SRO/RO

KA # & KA VALUE: 201001K2.04 3.2/3.3 10CFR55.41 Knowledge of electrical power supplies to scram discharge volume vent and drain valves.

REFERENCE: LO000142 CRDH rev. 11, page 17

SOURCE: **NEW QUESTION – RO T2, GP1, #1**

LO: 5192 Describe the physical connections and or the cause and effect relationship between the CRDH system and the following:  
a. Reactor Protection System.

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: On a loss of RPS B, RPS-RLY-K142 deenergizes and closes CRD-V-11. Either CRD-V-11 or 181 not full open cause the light to indicate closed. A loss of RPS A does not cause the relay to deenergize. Neither a ½ scram on RPS A or B cause either of the drain valves to close. D is correct.

COMMENTS:

**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #16

EXAM KEY

03/27/2003

EX03010

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The plant is operating at 24% power when a failure causes a main turbine trip.

Which of the following is correct for this condition?

- A. The reactor scrams from the main turbine trip.
- B. Feedwater temperature remains constant.
- C. Reactor power goes up due to a decrease in feedwater temperature.
- D. Reactor power goes down due to an increase in feedwater temperature.

ANSWER: C

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QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295005AK2.02 2.9/3.0 10CFR55.41 & 45 Knowledge of the interrelations between Main Turbine Generator Trip and the following: Feedwater Temperature.

REFERENCE: LO000163 Bleed Steam System rev. 6, pages 10 & 12

SOURCE: **NEW QUESITON** – RO T1, GP1, #1

LO: 7615 Determine the effect of a Bleed Steam malfunction on feedwater temperature.

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: At 24% power, the reactor does not scram from a turbine trip. The trip causes a loss of extraction steam to the feedwater heaters and a corresponding decrease in feedwater temperature to the reactor. Reactor power increases from the decrease in feedwater temperature. C is the only correct answer.

COMMENTS:



# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #17

EXAM KEY

03/27/2003

EX03011

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The plant was operating at 98% power when a transient occurred. Following the transient all 18 SRVs opened. Reactor pressure is now stable with 6 SRVs open. No operator actions have been taken.

Which of the following is correct for these conditions?

Both Recirculation Pumps...

- A. have tripped off.
- B. are running at 15 hertz.
- C. are running at 30 hertz.
- D. are running at 45 hertz.

ANSWER: A

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QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295037EA1.02 3.8/4.0 10CFR55.41 & 45 Ability to operate and/or monitor the following as they apply to Scram Condition Present and Reactor Power above APRM Downscale or unknown: Reactor Recirculation Control System

REFERENCE: LO000196 Reactor Recirc System rev. 12, pages 13 & 14 – LO000128 Main Steam System rev. 8, page 5

SOURCE: **NEW QUESTION** - RO T1, GP1, #12

LO: 5023 Predict the impact on the RRC System of each of the following conditions or events: d. ATWS logic

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: Following the transient, all SRVs opened. Reactor pressure has to be greater than 1131 psig for all valves to open. Reactor pressure greater than 1120 psig causes both RRC Pumps to trip. A is the only correct answer.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #18

EXAM KEY

03/27/2003

EX98052

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The plant is operating at 99% power. The RPS-A Group 1 white indicating light is still extinguished following the replacement of the light bulb.

A moment later, several LPRMs assigned to APRM-F fail, resulting in 10 LPRM inputs to APRM-F.

Which of the following describes the immediate plant response to these conditions?

- A. 1/2 scram RPS-B only.
- B. 1/2 scram RPS-A only.
- C. 1/2 of the control rods fully insert.
- D. Group 1 RPS control rods fully insert.

ANSWER: D

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QUESTION TYPE: RO/SRO

KA # & KA VALUE: 212000K5.02 3.3/3.4 10CFR55.41 & 45 Knowledge of the operational implications of the following concepts as they apply to Reactor Protection System: Specific logic arrangements.

REFERENCE: LR000149 APRM System rev. 9, page 18 LR000161 Reactor Protection System rev. 11, page 5 & 14

SOURCE: **BANK QUESTION – DIRECT – 98 NRC EXAM -**  
RO T2, G1, #7

LO: 5092 List the setpoint, trip action and enabling conditions for these APRM status lights of P603 apron section: a. UPSC TR OR INOP.

RATING: H4

ATTACHMENT: NONE

JUSTIFICATION: Less than 14 LPRM inputs to any APRM results in an INOP trip for that APRM. The INOP trip causes a 1/2 scram in RPS B. The loss of the RPS-A Group 1 light indicates a blown fuse. The 1/2 scram coincident with the blown fuse in RPS-A results in a 1/4 scram. All rods associated with RPS-Q Group 1 insert full in.

COMMENTS: Minor changes made to stem to make question clearer.

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #19

EXAM KEY

03/27/2003

EX03012

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A reactor startup is in progress when a Rod Out Block is received due to an SRM-D Inop trip.

Which of the following is correct for these conditions?

The rod block was caused by a loss of...

- A. DP-SO-A
- B. DP-SO-B
- C. DP-S1-1A
- D. DP-S1-2A

ANSWER: B

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QUESTION TYPE: RO/SRO

KA # & KA VALUE: 215004K2.01 2.6/2.8 10CFR55.41 Knowledge of electrical power supplies to the following: SR<M channels detectors.

REFERENCE: LO000132 SRM Monitoring System rev. 9, pages24 & 28

SOURCE: **NEW QUESTION – RO T2, GP1, #11**

LO: Predict the effect a failure of 24 VDC bus SO-B has on:  
b. SRM

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: The loss of 24 VDC causes an inop trip and rod block on the SRM. SRM-D is powered from DP-SO-B. B is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #20

EXAM KEY

03/27/2003

EX03013

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The plant is shutdown with RHR-P-2B running in the Shutdown Cooling Mode.

RRC-P-1A is off with RRC-V-23A (suction) open and RRC-V-67A (discharge) closed.

RRC-P-1B is off with RRC-V-23B (suction) open and RRC-V-67B (discharge) closed.

RRC-V-67A is then inadvertently opened.

Which of the following is correct concerning these conditions?

- A. The suction for RHR-P-2B is from Recirculation Loop B, which ensures adequate cooling at any reactor level.
- B. The discharge from RHR-P-2B for Shutdown Cooling goes directly into the core, which ensures adequate cooling at any reactor level.
- C. Reactor level must be greater than +35 inches to prevent undetected heating of the reactor vessel.
- D. Reactor level must be greater than +60 inches to prevent undetected heating of the reactor vessel.

ANSWER: D

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QUESTION TYPE: SRO/RO

KA # & KA VALUE: 205000K6.03 3.1/3.2 10CFR55.41 & 45 - Knowledge of the effect that a loss or malfunction of the following will have on the SHUTDOWN COOLING SYSTEM/MODE: Recirculation system.

REFERENCE: SOP-RHR-SDC rev. 1, page 16 and LO000198 rev 10, page 4

SOURCE: **BANK QUESTION – 2002 NRC EXAM – EX02054 MODIFIED**  
RO T2, GP2, #4

LO: 5774 – Describe the flow path for RHR Shutdown Cooling.

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: As stated in SOP-RHR-SDC, when the 67A valve is opened, a short circuit pathway is opened. If Reactor level is reduced to less than 60 inches, core circulation cannot be assured and undetected heating is the result. D is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #21

EXAM KEY

03/27/2003

EX98081

---

TIP Channel A is inserted into the core for calibration of LPRMs. A loss of both feedpumps then occurs and reactor level decreases to -63 inches before HPCS injects and returns level to the normal operating band.

Which of the following describes the automatic TIP response?

- A. The TIP drive continues to insert the detector to the Core Top Limit and completes the Tip trace. The detector then withdraws into the shield chamber and the ball valve closes.
- B. Immediately on receipt of the -50 inches signal, the squib valve fires, isolating the drive mechanism.
- C. The inserted TIP detector withdraws into the shield chamber, the ball valve closes, and TIP-V-15, Tip Purge Isolation Valve closes.
- D. The inserted TIP detector withdraws and stops outboard of the Indexer, and the ball valve closes.

ANSWER: C

---

QUESTION TYPE: SRO/RO

KA # & KA VALUE: 215001K4.01 3.4/3.5 10CFR55.41 Knowledge of the TIP design features and or interlocks which provide for the following: Primary containment isolation.

REFERENCE: LO000155 Traversing In-Core Probe System rev. 10, page 13

SOURCE: **BANK QUESTION – 98 NRC EXAM EX98081 – DIRECT**  
RO T2, GP3, #1

LO: 6989 Explain the TIP System response to an FA signal.

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: A is incorrect because the drive does not continue for a complete trace. B is incorrect because the squib does not fire on and isolation signal. D is incorrect because the detector does not stop until it is in the shield. C is correct.

**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #22

EXAM KEY

03/27/2003

EX03014

---

The plant is operating at 99% power when several annunciators are received on P603, including a ½ scram on RPS-A.

Which of the following caused these indications?

- A. APRM E power spike to 107%.
- B. APRM F Mode Switch out of operate.
- C. APRM A Flow Unit failed low.
- D. APRM B Comparator 16%.

ANSWER: C

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 215005K1.01 4.0/4.0 10CFR55.41 & 45 Knowledge of the physical connections and cause/effect relationships between APRM/LPRM System and the following: RPS

REFERENCE: LO000149 APRM System rev. 9, pages 25 & 26

SOURCE: **NEW QUESTION** – RO T2, GP1, #12

LO: 7757 Predict the effect a failure of the APRM System has on:  
a. RPS

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: A is incorrect because it only causes a rod block. B and D are both incorrect because they are RPS-B APRMs. C is correct as stated in the reference.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #23

EXAM KEY

03/27/2003

EX03015

The plant was operating at 80% power when a transient occurred resulting in an auto initiation of RCIC. Approximately 15 minutes later the CRO notes that RCIC-V-31 suction from the Suppression Pool is open and RCIC-V-10 suction from the CSTs is closed.

Which of the following is correct?

- A. RCIC-V-10 auto closes on the initiation signal. RCIC-V-10 full closed causes RCIC-V-31 to auto open.
- B. RCIC-V-31 auto opens on the initiation signal. RCIC-V-31 full open causes RCIC-V-10 to close.
- C. There is a low level in the CSTs.
- D. There is a high level in the Suppression Pool.

ANSWER: C

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 217000A1.06 3.2/3.3 10CFR55.41 & 45 Ability to predict and/or monitor changes in parameters associated with operating the RCIC System controls including: Condensate storage tank level.

REFERENCE: LO000180 rev. 11 RCIC System, pages 12 & 13

SOURCE: **NEW QUESTION** – RO T2, GP1, #16

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

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: A is incorrect because the 10 valve opens on an initiation signal. B is incorrect because the 31 valve has no direct open signal from an initiation signal. D is incorrect because there is no auto signal associated with high suppression pool level. C is correct because the 31 opens on a low CST level and the 10 valve closes when the 31 is full open.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #24

EXAM KEY

03/27/2003

EX01133

---

The plant was operating at 87% power when an MSIV isolation occurred. Following the isolation, a loss of DP-S1-1A occurred.

Which of the following is correct concerning these conditions?

- A. The relief function for all SRVs is disabled, manual operation can only be performed from the Div 2 ADS switches on P631.
- B. The relief function for all SRVs is disabled, manual control can be performed for all SRVs from P601.
- C. The relief function for all SRVs is operable, manual operation can only be performed from the Div 2 ADS switches on P631.
- D. The relief function for all SRVs is operable, manual control can be performed for all SRVs from P601.

ANSWER: A

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 239002K6.03 2.7/2.9 10CFR55.41.7/45.7 Knowledge of the effect that a loss or malfunction of the following will have on the Relief/Safety Valves: AC Power.

REFERENCE: LO000128 Main Steam System rev. 8, page 7

SOURCE: **BANK QUESTION – DIRECT – 2001 NRC EXAM EX01133**  
RO T2, GP1, #21

LO: 5528 Describe the physical connection and or cause and effect relationship between the SRVs and: a. SPVD

RATING: H4

ATTACHMENT: NONE

JUSTIFICATION: DP-S1-1A powers the C solenoids for all SRVs and the A solenoids for the ADS SRVs. This leaves only the B solenoids with power. They are controlled manually from the Div 2 P631. A is correct.

COMMENTS:



# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #25

EXAM KEY

03/27/2003

EX03016

---

The plant is operating at 79% power when CRO-1 reports reactor level going up and reactor pressure going down. Shortly thereafter, the MSIVs close and the reactor scrams.

Which of the following is the cause of this transient?

- A. The selected DEH Pressure Controller has instantly failed low.
- B. The selected DEH Pressure Controller has slowly failed high.
- C. The backup DEH Pressure Controller has slowly failed low.
- D. The backup DEH Pressure Controller has instantly failed high.

ANSWER: B

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 241000K3.03 3.7/3.8 10CFR55.41 & 45 Knowledge of the effect that a loss or malfunction of the Reactor/Turbine Pressure Regulating System will have on the following: Reactor water level.

REFERENCE: LO000146 DEH Control System rev. 7, page 40

SOURCE: **BANK QUESTION – DIRECT LX000140 –**  
RO T2, GP1, #23

LO: 5286 Describe the DEH response to the following Pressure Controller failure: a. one controller fails high gradually.

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: A controller that fails slowly in the high direction causes an uncontrolled opening of the governor valves. This reduces reactor pressure. The result of the reduction in reactor pressure is an increase in reactor level due to swell and an MSIV isolation when pressure drops to 831 psig. B is correct. An instantaneous failure results in a swap to the other controller. A slow failure in the low direction results in DEH using the highest signal for control. In these cases, the reactor stays on the line.

COMMENTS: The question was modified slightly to fit the KA.

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #26

EXAM KEY

03/27/2003

EX99070

Which of the following conditions shall be announced to the plant staff over the PA system?

- A. A radioactive spill in the RW 437' level has just been reported by the laborer supervisor.
- B. The CRO is starting the Auxiliary Oil pump for the 'B' RFP as part of a plant shutdown.
- C. The CRO is starting the Turbine Seal Oil Backup pump as part of a plant startup.
- D. Stopping SW-P-1A after securing from Shutdown cooling during a plant startup.

ANSWER: A

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 2.1.14 2.5/3.3 10CFR55.43.5 & 45 Knowledge of system status criteria which require the notification of plant personnel.

REFERENCE: PPM 1.3.1 Operating Policies, Programs, and Practices rev. 59, page 41 step 4.12.2

SOURCE: **BANK QUESTION – 99 NRC EXAM #99070 – DIRECT – RO T3, #3**

LO: 6086 State what information should be announced to the plant staff over the PA system.

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: A is correct because it is a condition with a "present or expected hazard". The other answers are incorrect, because they are not starting equipment 4160V or above or identified in the list of conditions in PPM 1.3.1.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #27

EXAM KEY

03/27/2003

EX99014

---

The reactor was operating at 99% power when a main turbine trip occurred due to an electrical fault in the Main Generator. Reactor conditions have stabilized and the CRO is ready to transfer FWLC to RFW-FCV-10A/B, when he notes reactor level at 18 inches and stable.

Which of the following is correct for these conditions?

- A. The Primary Programmable Logic Controller has failed and needs to be reset.
- B. The Master Level Controller has failed and will have to be placed in manual.
- C. FWLC will return level to normal 9 minutes following the scram reset..
- D. FWLC will return level to normal 12 minutes following the scram.

ANSWER: C

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295031EA1.13 4.3/4.3 10CFR.41 & 45 Knowledge of the reasons for the following responses as they apply to Reactor Low Water Level: Reactor Water Level Control

REFERENCE: LO000157 Feedwater Level Control System rev. 11, page 15

SOURCE: **BANK QUESTION – 99 NRC EXAM EX99014**  
RO T1, GP1, #10

LO: 5397 State the purpose of Setpoint Setdown, when it initiates, how it is reset and how it affects the FWLC system.

RATING: H2

ATTACHMENT: NONE

COMMENTS:

JUSTIFICATION: The feedwater level control setpoint is reduced by 18" following a scram. It stays at this lower setpoint until the scram is reset. When the scram is reset, the setpoint ramps up 18 inches over a 9 minute time period. C is correct.

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #28

EXAM KEY

03/27/2003

EX02053

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What is the basis for the 135° F Tech Spec LCO for Drywell Temperature?

Maintaining Drywell Temperature less than the LCO value assures that the...

- A. external design pressure will not be exceeded when starting one loop of RHR Drywell Spray.
- B. drywell to wetwell interface will not fail during the blowdown portion of a DBA LOCA.
- C. equipment inside the Drywell needed to mitigate the effects of a DBA LOCA will operate under conditions expected for the accident.
- D. peak post LOCA drywell temperature does not exceed the design temperature of 290° F.

ANSWER: C

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295028EK1.02 2.9/3.1 10CFR55.41 - Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL TEMPERATURE: Equipment environmental qualification.

REFERENCE: Tech Spec Bases B3.6.1.4 page B3.6.1.4-1

SOURCE: **BANK QUESTION - 2002 NRC EXAM - DIRECT**

RO T1, GP2, #9

LO: 8311 Given a list, identify the statement that describes the purpose of attempting to maintain drywell temperature below 135°F.

RATING: L3

ATTACHMENT: NONE

JUSTIFICATION: The Basis for TS 3.6.1.4 states that as long as Drywell temperature is maintained less than the TS LCO of 135° F, that equipment inside the containment needed to mitigate the effects of a DBA LOCA will operate as expected. C is correct. A, B, and D are all misapplications or misstatements of other limits.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #29

EXAM KEY

03/27/2003

EX03074

---

The plant was operating at 95% power when a transient occurred. The following conditions now exist:

Drywell pressure is 1.59 psig and up slow.  
Suppression Pool level is -1.25 inches and down slow.  
Control rod 30-31 is at position 48.  
ARM-RIS-4 East CRD Area indicates 2.3E4 mr/hr.  
Reactor Building differential pressure is -.05 inches of water.  
Reactor Building Exhaust Plenum is 12 mr/hr

Based on these conditions, which of the following is correct?

Enter...

- A. PPM 5.1.2 RPV Control ATWS
- B. PPM 5.2.1 Primary Containment Control
- C. PPM 5.1.1 RPV Control
- D. PPM 5.3.1 Secondary Containment Control.

ANSWER: D

---

QUESTION TYPE: RO/SRO  
KA # & KA VALUE: 295033 2.4.1 4.3/4.6 10CFR55.41, 43.5, and 45 Knowledge of EOP entry conditions and immediate action steps.  
REFERENCE: PPM 5.0.10 Flowchart Training Manual rev. 6, pages 284 and table 24  
SOURCE: **NEW QUESTION** – RO T1, GP2, #15  
LO: 8017 Given plant conditions, recognize an EOP entry condition and enter the appropriate flow chart.  
RATING: H2  
ATTACHMENT: YES – PPM 5.3.1 Secondary Containment control, Table 24.  
JUSTIFICATION: ARM-RIS-4 (for PPM 5.3.1 Secondary Containment Control) is an entry for PPM 5.3.1. None of the other indications require an EOP entry. D is correct.  
COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #30

EXAM KEY

03/27/2003

EX03017

---

The plant is operating at 56% power. LD-TE-3A is indicating greater than the Maximum Safe Operating Value due to a leak in RWCU Pump Room A.

Which of the following actions is taken to ensure energy discharged to the Secondary Containment is reduced to decay heat levels?

Enter...

- A. PPM 5.2.1 Primary Containment Control.
- B. PPM 5.1.3 Emergency Depressurization.
- C. PPM 5.1.2 RPV Control ATWS.
- D. PPM 5.1.1 RPV Control.

ANSWER: D

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295032EK3.02 3.6/3.8 10CFR55.41 & 45 - Knowledge of the reasons for the following responses as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE: Reactor SCRAM

REFERENCE: PPM 5.0.10 rev. 6, page 300

SOURCE: **BANK QUESTION – 02 NRC EXAM EX02005 – MODIFIED – RO T1, GP3, #2**

LO: 8457 – Given a list, identify the statement that describes the reason for entering PPM 5.1.1, RPV CONTROL if secondary containment parameters are approaching their Maximum Safe Operating Values and a primary system is discharging reactor coolant into secondary containment.

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: PPM 5.0.10 states that PPM 5.1.1 is entered to ensure the energy discharged to the Secondary Containment is reduced to decay heat levels when one parameter exceeds its max safe operating value. D is correct. Entering any of the other procedures listed does not cause the reactor to be scrammed.

COMMENTS:

**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #31

EXAM KEY

03/27/2003

EX03018

---

The plant was operating at 95% power when a failure occurred resulting in the following conditions:

- Reactor power is going down slowly.
- Generator output is going down slowly.
- Rod Drift Annunciator on P603.
- Two control rods indicate full in with the blue scram lights energized.

Which of the following caused these indications?

- A. ATWS/ARI division 1 valves failed open.
- B. Control air header pressure 64 psig and going down.
- C. CRD Equalizing valves failed open.
- D. Loss of both CRD pumps.

ANSWER: B

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 201001K6.03 3.0/2.9 10CFR55.41 & 45 Knowledge of the effect that a loss or malfunction of the following will have on the Control Rod Drive Hydraulic System: Plant air systems

REFERENCE: KO000142 CRDH System rev. 11, page 33

SOURCE: **BANK QUESTION – LX00116 MODIFIED –**  
RO T2, GP1, #2

LO: 5192 b – Describe the physical and/or cause and effect relationships between the CRDH System and the following:  
b. Control Air System

RATING: H2

ATTACHMENT: NONE

JUSTIFICATION: A, C, and D are all incorrect because these failures do not result in any control rod motion. B is correct because Control air header pressure less than 70 psig causes the scram valves to begin to open which results in blue lights on the 603 and control rods drifting into the core.

COMMENTS:

**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #32

EXAM KEY

03/27/2003

EX03019

---

A plant startup is in progress. Control rods are being withdrawn to make the reactor critical. A plant I&C Technician mistakenly places the mode switch for SRM-C in the Standby position.

Which of the following ARPs should be used to mitigate the consequences of this action?

- A. 4.603.A7 SRM MONITORS UPSCL OR INOP
- B. 4.603.A7 SRM MONITORS DOWNSCALE
- C. 4.603.A7 ½ SCRAM SYSTEM A
- D. 4.603.A8 ½ SCRAM SYSTEM B

ANSWER: A

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 215004A2.02 3.4/3.7 10CFR5541 & 45 Ability to predict the impacts of the following on the SRM System and based on these predictions, use procedures to correct, control or mitigate the consequences of those abnormal conditions or operations: SRM Inop condition

REFERENCE: PPM 4.603.A7 rev. 28 page 68, annunciator drop #6-5

SOURCE: **NEW QUESTION** – RO T2, GP1, #10

LO: 5946 – List the scrams and rod blocks generated by the SRM System, including the setpoint for each and when they are bypassed.

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: When the Mode Switch is taken out of OPERATE, a rod block is generated due to an SRM INOP condition. There are no scrams generated. Only A is correct.

COMMENTS:



**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #33

EXAM KEY

03/27/2003

EX03020

---

The plant is operating at 100% power with reactor level indicating +36 inches on the Narrow Range.

Assuming a normal setpoint for FWLC, what is the actual level inside the Steam Dryer Shroud?

- A. 15 inches
- B. 22 inches
- C. 29 inches
- D. 36 inches

ANSWER: C

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 216000A3.01 3.4/3.4 Ability to monitor the automatic operation of the Nuclear Boiler Instrumentation including: Relationship between meter/recorder readings and actual parameter values.

REFERENCE: LO000126 NBI rev. 8, page 13

SOURCE: **NEW QUESTION – RO T2, GP1, #14**

LO: NO LO

RATING: H2

ATTACHMENT: NONE

JUSTIFICATION: The pressure drop across the steam dryer at 100% power is 7 inches of water. This results in an actual level inside the dryer shroud 7 inches less than indicated on the narrow range. C is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #34

EXAM KEY

03/27/2003

EX98119

---

Two CROs are in the control room. A back panel alarm occurs for the RB HVAC system when CRO1 observes that CRO3 is in the SM office discussing an upcoming evolution.

Which of the following is the correct action in this situation concerning going to the back panels to investigate the alarm?

- A. CRO1 investigates the alarm, while CRO3 observes plant conditions from the SM office.
- B. CRO1 investigates the alarm, but takes as little time as possible to return to the front area.
- C. CRO3 accompanies CRO1 to peer check his investigation of the alarm.
- D. CRO3 investigates the alarm while CRO1 remains at the CRO desk near P603.

ANSWER: D

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 2.1.1 3.7/3.8 10CFR55.41 & 45 Knowledge of conduct of operations requirements.

REFERENCE: PPM 1.3.1 rev 59, pages 52 and 81

SOURCE: **BANK QUESTION – 98 NRC EXAM EX98119 – RO T3, #4**

LO: 6095 – State who shall be “at the controls” in the Control room at all times.

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: Per PPM 1.3.1, “at least one licensed CRO shall be at the controls in the control room at all times.” All other answers do not comply with this requirement. The “operator at the controls” boundary does not include the SM office.

COMMENTS:

**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #35

EXAM KEY

03/27/2003

EX98126

---

You've been assigned to briefly inspect a valve inside of a valve room which is a posted RADIATION AREA. Your personal electronic dosimeter is set to alarm at an accumulated dose of 10 mr. It currently indicates 0 mr.

What is the MAXIMUM time you could expect to be in the area before it alarms?

- A. 2 hours
- B. 1/2 hour
- C. 1 hour
- D. 1 1/2 hours

ANSWER: A

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 2.3.1 2.6/3.0 10CFR55.41, 43.4, & 45 Knowledge of 10CFR20 and related facility radiation control requirements.

REFERENCE: SWP-RPP-01, rev 4, page 43

SOURCE: **BANK QUESTION – DIRECT - 98 NRC EXAM EX98126 – RO T3, #10**

LO: 6013 – Define the following term: a. High Radiation Area

RATING: H2

ATTACHMENT: NONE

JUSTIFICATION: The Radiation area minimum threshold is 5 mr/hr. The **maximum** amount of time available to a worker for a 10 mr limit would be 2 hours in the area.

COMMENTS:

**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #36

EXAM KEY

03/27/2003

EX03021

---

The plant was operating at 99% power when a reactor scram occurred due to an RPS failure on RPS-A coupled with an existing 1/2 scram on RPS-B.

Which of the following acts first to control reactor pressure under these conditions?

- A. Main Turbine Governor Valves.
- B. Main Turbine Bypass Valves.
- C. Main Steam Relief Valves, Relief setpoint.
- D. Main Steam Relief Valves, Safety setpoint.

ANSWER: A

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295006AA1.03 3.7/3.7 10CFR55.41 & 45 Ability to operated and/or monitor the following as they apply to Scram: Reactor/Turbine pressure regulating system.

REFERENCE: LO000146 DEH Control System rev. 7, page 4  
LO000129 Main Turbine System rev. 9, pages 32 & 33

SOURCE: **NEW QUESTION – RO T1, GP1, #3**

LO: 5568 List all parameters and setpoints that will cause a Turbine Trip.  
9955 Describe the DEH response to changes in reactor pressure in each of the four DEH modes, including the relationship between reactor pressure and DEH pressure setpoint.

RATING: H2

ATTACHMENT: NONE

JUSTIFICATION: The scram described does not cause a direct turbine trip. Pressure control immediately following the scram is controlled by DEH in Mode 4 with the governor valves controlling pressure. A is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #37

EXAM KEY

03/27/2003

EX03022

---

The plant was operating at 98% power when a failure occurred causing an entry into PPM 5.2.1 Primary Containment Control due to increasing Drywell pressure. Suppression Pool level is 1.8 inches and going up. Suppression Pool Temperature is 84°F and up slow.

Which of the following is correct for these conditions?

- A. No action needs to be taken concerning Suppression Pool level until it exceeds the EOP entry condition.
- B. Action should be taken per SOP-RHR-SPC to correct the increasing Suppression Pool level prior to initiating more complex actions.
- C. No action needs to be taken concerning Suppression Pool Temperature until it exceeds the EOP entry condition.
- D. Action should be taken per SOP-RHR-SPC to prevent exceeding the Suppression Pool temperature entry condition of 110°F.

ANSWER: B

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295029EK3.02 3.6/4.2 10CFR55.41 & 45 Knowledge of the following responses as they apply to High Suppression Pool Level: Lowering Suppression Pool water level.

REFERENCE: PPM 5.0.10 rev. 6, page 261

SOURCE: **NEW QUESTION – RO T1, GP2, #11**

LO: 8375 – Given a list, identify the statement that describes the purpose of attempting to maintain Suppression Pool level between –2 inches and +2 inches.

RATING: H2

ATTACHMENT: NONE

JUSTIFICATION: PPM 5.0.10 states that actions should be taken to reduce suppression pool level via normal means in advance of initiating more advanced actions. B is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #38

EXAM KEY

03/27/2003

EX99055

---

The plant is in MODE 5 with refueling underway. ROA-FN-1A and REA-FN-1A are out of service for maintenance, when REA-FN-1B trips due to an overload.

Which of the following actions is required?

- A. Immediately suspend movement of irradiated fuel in the secondary containment, suspend CORE ALTERATIONS, and initiate action to suspend operations with the potential to drain the vessel.
- B. Restore Secondary Containment to operable within 4 hours.
- C. Restore Secondary Containment to operable within 12 hours.
- D. Suspend movement of irradiated fuel in the secondary containment, suspend CORE ALTERATIONS and initiate action to suspend operations with the potential to drain the vessel within 4 hours.

ANSWER: A

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295035EK1.01 3.9/4.2 10CFR55.41 Knowledge of the operational implications of the following concepts as they apply to Sec. Cont. High Differential Pressure: Secondary Containment Integrity.

REFERENCE: Tech Spec 3.6.4.1, amendment 169, pages 3.6.4-1 & 2

SOURCE: **BANK QUESTION – 99 NRC EXAM EX99055 0- DIRECT**  
RO, T1, G3, #4

LO: 7007 With Tech Specs provided, locate all Safely Limits and/or LCOs that directly relate to the Secondary Containment.

RATING: H3

ATTACHMENT: YES - Tech Spec 3.6.4.1, amendment 169, pages 3.6.4-1 & 2

JUSTIFICATION: Reactor building pressure is a requirement for Sec Cont operability. With no reactor building ventilation, pressure increases to 0 inches WC and this TS is not met. In MODE 5 with no Sec Cont Integrity, the actions of A are required.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #39

EXAM KEY

03/27/2003

EX03023

---

The plant was operating at 98% power when a failure in the Reactor Feedwater Control system caused RFW-DT-1A to runback to 3000 RPM.

Assuming no operator action, which of the following is the first response of the Reactor Recirculation System?

Both RRC Pumps...

- A. trip off.
- B. runback to 45 hz.
- C. runback to 30 hz.
- D. runback to 15 hz.

ANSWER: D

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 202002K6.04 2.8/2.8 10CFR55.41 & 45 Knowledge of the effect that a loss or malfunction of the following will have on the Recirculation Flow Control System: Feedwater Flow inputs.

REFERENCE: LO000184 Recirc Flow Control rev. 13, pages 9

SOURCE: **NEW QUESTION – RO T2, GP1, #3**

LO: 9677 Describe the significance of the following indications on the RRC controllers: RX LOW LEVEL light.

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: When a feedpump flow controller failure causes the drive turbine to slow, feedwater flow decreases. With a loss of flow, reactor level goes down. As long as the feedpump does not trip, there is no effect on RRC operation until reactor level decreases to +13 inches. Both RRC pumps runback to 15 hz at this point. D is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #40

EXAM KEY

03/27/2003

EX03024

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A control rod withdrawal for a plant startup is in progress. The Shift Nuclear Engineer has determined that rods will be withdrawn in the A1 sequence with group 1 rods pulled first, then group 2 rods, then group 3 rods, then group 4 rods and groups 5 through 10 rods in that order.

All control rods withdrawn up to this point in the startup have had no restraints on movement.

When the CRO selects the next control rod and attempts to withdraw the control rod continuously to position 48, the rod stops at position 4.

Which RSCS rod group contains this control rod?

- A. 1
- B. 2
- C. 3
- D. 4

ANSWER: C

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 201004K4.06 3.3/3.4 10CFR55.41 Knowledge of the RSCS design features and/or interlocks which provide for the following: Group notch control.

REFERENCE: LO000160 RSCS rev. 1, page 11

SOURCE: **NEW QUESTION – RO T2, GP2, #1**

LO: 5806 Explain the following items: g. Withdrawal/Insert Limits

RATING: H2

ATTACHMENT: NONE

JUSTIFICATION: Groups 1 and 2 can be pulled continuously from position 00 to 48. The first rod in group 3 must be pulled using the RSCS banked withdrawal positions. The control rods in group 4 also use banked withdrawal positions, but only the first rod in group 3 follows a control rod that can be pulled cont. from 00 to 48. C is correct.

COMMENTS: RSCS Group information added to stem of question.



**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #41

EXAM KEY

03/27/2003

EX03025

---

Which of the following could be affected by a lockout on SM-8?

- A. High Pressure Core Spray
- B. Suppression Pool Cooling
- C. Low pressure Core Spray
- D. Upper Drywell Spray

ANSWER: B

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 219000K2.02 3.1/3.3 10CFR55.41 Knowledge of electrical power supplies to the following: Pumps

REFERENCE: LO000198 RHR rev. 10, page 44

SOURCE: **NEW QUESTION – RO T2, GP2, #7**

LO: 5058 Identify the loads on SM-8

RATING: H2

ATTACHMENT: NONE

JUSTIFICATION: Of the functions listed, only suppression pool cooling from RHR loop B could be affected by a loss of SM-8. B is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #42

EXAM KEY

03/27/2003

EX03026

---

The plant is operating at 87% power with the Seal Oil Backup Pump tagged out for maintenance. The main shaft oil pump slowly fails until it ceases pumping.

Which of the following is correct for these conditions?

- A. The main turbine continues to operate with all control oil supplied by the Bearing Oil Pump.
- B. The main turbine continues to operate with all control oil supplied by the Emergency Bearing Oil Pump.
- C. The reactor scrams from a turbine trip and pressure is controlled by the Bypass Valves.
- D. The reactor scrams from a turbine trip and pressure is controlled by the Safely/Relief Valve operation.

ANSWER: C

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 245000K3.02 3.9/4.0 10CFR55.41 & 45 Knowledge of the effect that a loss or malfunction of the Main Turbine Generator and Auxiliary Systems will have on the following: Reactor Pressure.

REFERENCE: LO000135 Turbine Lube Oil rev. 7, pages 3 & 4

SOURCE: **NEW QUESTION – RO T2, GP2, #10**

LO: 7009 Identify the loads supplied by each of the following pumps and their purpose: Bearing Oil Pump and Seal oil Backup Pump

RATING: H2

ATTACHMENT: NONE

JUSTIFICATION: All high pressure control oil for the main turbine is supplied by the Seal Oil Backup Pump with the loss of the main shaft pump. With no high pressure control oil, the main turbine trips causing a reactor scram and reactor pressure control on the bypass valves. C is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #43

EXAM KEY

03/27/2003

EX03027

---

The plant is operating at 99% power when Reactor Building Exhaust Plenum radiation increases to 24 mr/hr.

What is the effect on control room ventilation?

- A. Control Room Emergency Chillers start and supply chilled water to the normal air handling units.
- B. Control Room Emergency Chillers start and supply chilled water to the emergency air handling units.
- C. Control Room Emergency Filtration starts and takes a suction on the remote air intakes to pressurize the control room.
- D. Control Room Emergency Filtration starts and takes a suction on the control room to lower control room pressure.

ANSWER: C

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 290003A3.01 3.3/3.5 10CFR55.41 & 45 Ability to monitor automatic operations of the control Room HVAC including: Initiation/reconfiguration.

REFERENCE: LO000201 Control Room HVAC rev. 9, page 19

SOURCE: **NEW QUESTION – RO T2, GP2, #17**

LO: 5225 State the automatic features associated with the following Cont Room HVAC components: Emergency Filter units/components.

RATING: L3

ATTACHMENT: NONE

JUSTIFICATION: Upon receipt of the Z signal, the Emerg Filtration Unit starts and takes a suction from the remote air intakes. This pressurizes the control room. C is correct. A and B are incorrect because Emerg chilled water does not start.

COMMENTS:

**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #44

EXAM KEY

03/27/2003

EX03028

---

The reactor was operating at 75% power when a transient caused reactor level to go down to -54 inches.

Which of the following is correct?

- A. Both RWCU-V-1 and RWCU-V-4, Containment Isolation Valves close. The running RWCU Pump trips.
- B. Only RWCU-V-1, Containment Isolation Valve closes. The running RWCU Pump trips.
- C. Only RWCU-V-4, Containment Isolation Valve closes. The running RWCU Pump continues to operate in the recirculation mode.
- D. Neither RWCU-V-1 nor RWCU-V-4, Containment Isolation Valves close. The running RWCU Pump continues to operate.

ANSWER: A

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295009AK2.04 2.6/2.6 10CFR55.41 & 45 Knowledge of the interrelations between Low Reactor Water Level and the following: Reactor Water Cleanup

REFERENCE: LO000190 RWCU System rev. 10, pages 9 & 10

SOURCE: **NEW QUESTION – RO T1, GP1, #4**

LO: 5035 – List all RWCU System and filter demineralizer isolations including setpoints and valves affected.

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: Both RWCU isolation valves close at -50 inches, which causes the running (both) RWCU pumps to trip. A is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #45

EXAM KEY

03/27/2003

EX03029

---

The plant was operating at power when a single jet pump fails.

Which of the following would be a result of this failure?

- A. A reduction in indicated core dP
- B. A reduction in total drive flow
- C. An increase in actual total core flow
- D. An increase in reactor feed flow

ANSWER: A

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295001AA2.04 3.0/3.1 10CFR55.41, 43.5, & 45 Ability to determine and/or interpret the following as they apply to Partial or Complete Loss of Forced Core Flow Circulation: Individual Jet Pump flows.

REFERENCE: LO00196 RRC rev. 12, page 28

SOURCE: **NEW QUESTION** – RO T1, GP2, #1

LO: 5585 Describe the sensing points for calibrated and uncalibrated jet pump differential pressure indication.  
5586 Describe how loop flow indication on P603 is derived.

RATING: H2

ATTACHMENT: NONE

JUSTIFICATION: B is incorrect because drive flow would increase. C is incorrect because actual core flow would decrease. D is incorrect because feed flow would drop due to the decrease in reactor power. A is correct as stated in the reference.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #46

EXAM KEY

03/27/2003

EX03030

---

The plant is operating at 99% power. RHR-P-2B was in operation for a surveillance when a fault caused an overcurrent on RHR-P-2B. The overcurrent caused a lockout on BKR 8-3 and a loss of SM-8.

Which of the following is correct for these conditions?

- A. The lockout on BKR 8-3 auto resets as soon as the breaker for RHR-P-2B is racked out.
- B. The lockout relay must be manually reset at BKR 8-3 before the bus can be repowered.
- C. SM-8 can be manually repowered as soon as RHR-P-2B is racked out.
- D. SM-8 will repower automatically as soon as RHR-P-2B is racked out.

ANSWER: B

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295003 2.4.48 3.5/3.8 10CFR43.5 & 45 Ability to interpret control room indications to verify the status and operation of system/and understand how operator actions and directives affect plant and system conditions.

REFERENCE: LO000182 AC Distribution rev. 12, pages 17 & 18

SOURCE: **NEW QUESTION – RO T1, GP2, #2**

LO: 5049 Explain the function of the following protective relays:  
d. 86 device

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: Prior to the reset of an 86 device the fault must be cleared from the bus. The 86 then can be manually reset and the breaker can be close manually. B is correct.

COMMENTS: Changed stem

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #47

EXAM KEY

03/27/2003

EX98042

The plant is operating at 99% power. A leak in the Nitrogen Supply Header has forced the operators to manually close CN-V-65 (CIA Crosstie).

Which of the following describes the effect on the SRVs?

- A. Non ADS SRV operation from P601 will be limited to energy available in the SRV accumulators. ADS valves will only be operable from P601.
- B. SRV operation from P-601 will be limited to energy available in the SRV accumulators. ADS valves can be operated from back panels P628 and P631.
- C. ADS valves will only be operable from P601, non-ADS SRVs will be operable from P601
- D. ADS valves will only be operable from P628 and P631, non-ADS SRVs will be operable from P601

ANSWER: B

---

QUESTION TYPE: RO/SRO  
KA # & KA VALUE: 295019AA2.02 3.6/3.7 10CFR55.41, 43.5, & 45 Ability to determine and/or interpret the following as they apply to Partial or Complete Loss of Instrument Air: Status of safety related instrument air system loads.  
REFERENCE: LO000128 Main Steam rev. 8, page 7  
SOURCE: **BANK QUESTION – 98 NRC EXAM EX98042 – DIRECT**  
RO T1, G2, #6  
LO: 5528 Describe the physical connection and/or the cause and effect relationship between the SRVs and: d. Containment Instrument Air  
RATING: H3  
ATTACHMENT: NONE  
JUSTIFICATION: During this scenario the only manual SRV operation would be from P-628/631 after the air for the non-ADS solenoids ran out. B is the only correct answer.  
COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #48

EXAM KEY

03/27/2003

EX03031

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The plant is operating at 64% power. A radioactive leak in the reactor building has caused RB Exhaust Plenum to indicate 18 mr/hr.

What of the following is correct?

- A. REA-FN-1A (1B) and ROA-FN-1A (1B) continue to operate. RB HVAC isolates.
- B. REA-FN-1A (1B) trips. ROA-FN-1A (1B) trips. RB HVAC isolates.
- C. A full inboard and outboard containment isolation, including MSIVs, occurs.
- D. A full inboard and outboard containment isolation occurs. MSIVs remain open.

ANSWER: B

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295033EK2.03 3.7/3.9 10CFR55.41 & 45 Knowledge of the interrelationships between High Secondary Containment Ar3e Radiation Levels and the following: Secondary Containment Ventilation.

REFERENCE: ABN-FAZ-QC FAZ Automatic Actions rev. 0, pages 3 & 4

SOURCE: **NEW QUESTION – RO T1, GP2, #14**

LO: 6916 Given an F, A, or Z signal actuation, identify those automatic actions that may have occurred.

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: Reactor Building Exhaust Plenum Radiation > 13 mr/hr causes a Z signal isolation. RB supply and exhaust fans trip and HVAC isolates from this signal. There is no full containment isolation from the Z signal. B is correct.

COMMENTS:



**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #49

EXAM KEY

03/27/2003

EX03032

---

The reactor was operating at 99% power when a transient occurred causing reactor power to decrease to approximately 65%.

Which of the following lights will be illuminated on the RRC individual loop flow controllers?

- A. One ASD Channel Failure
- B.  $\Delta T$  Cavitation
- C. Reactor Low Level
- D. FW Pump Trip

ANSWER: D

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 202002A3.02 3.4/3.4 10CFR55.41 & 45 Ability to operate automatic operations of the Recirculation Flow Control System including: Lights and alarms.

REFERENCE: LO000184 RRFC rev. 13, pages 9 & 10

SOURCE: **NEW QUESTION – RO T2, GP1, #4**

LO: 9677-6 Describe the significance of the following indications on the RRC individual controllers: FW PUMP TRIP light.

RATING: H2

ATTACHMENT: NONE

JUSTIFICATION: A would result in a higher power level, 51 hz. B and C would both result in a RRC pump speed of 15 hz and the reactor would be scrammed. D causes a runback to 30 hz and approximately 65% power. D is correct.

COMMENTS:

**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #50

EXAM KEY

03/27/2003

EX03033

---

Which of the following Reactor water levels prevents ADS auto initiation?

- A. -120
- B. -130
- C. -140
- D. -150

ANSWER: A

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 218000A4.12 4.2/4.3 10CFR55.41 & 45 Ability to manually operate and/or monitor in the control room: Reactor water level.

REFERENCE: LO000186 ADS rev. 9, page 5

SOURCE: **NEW QUESTON – RO T2, GP1, #18**

LO: 5071 State the condition that will automatically initiate ADS. Include signals, setpoints, and time delays.

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: As stated in the reference, the reactor level input to ADS auto initiation is –129 inches. Of the available selections only –120 inches prevents ADS auto initiation. A is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #51

EXAM KEY

03/27/2003

EX03034

---

Which of the following is an acceptable report to the CRS during emergency conditions?

- A. "RHR is in Suppression Pool Cooling."
- B. "RPS A has been placed on the dirty power supply."
- C. "Reactor level is -78 inches and going down rapidly."
- D. "Drywell pressure is 5.3 psig."

ANSWER: C

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 2.1.17 3.5/3.6 10CFR55.45 Ability to make accurate/clear and concise verbal reports.

REFERENCE: SWP-OPS-06 rev. 1, page 3 PPM 1.3.1 rev. 59, page 42

SOURCE: **NEW QUESTION – RO T3, #2**

LO: NO LO

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: A is incorrect because it is not specific as to which loop of RHR is in Suppression Pool Cooling. B is incorrect because of the use of the slang term "dirty power." D is incorrect because it does not include the trend with the report. C is correct as required by both referenced procedures.

COMMENTS:

**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #52

EXAM KEY

03/27/2003

EX03035

---

The plant is in MODE 5 with fuel movement for a full core offload about to begin.

How many SRMs are required to be operable prior to the start of fuel movement?

- A. 1
- B. 2
- C. 3
- D. 4

ANSWER: B

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 2.2.30 3.5/3.3 10CFR55.45 Knowledge of RO duties in the control room during fuel handling such as alarms from fuel handling area, communications with fuel storage facility, system operated from the control room in support of fueling operations, and supporting instrumentation.

REFERENCE: TS 3.3.1.2 amendment 169, table 3.3.1.2-1, pages 3.3.1.2-1 through 3.3.1.2-6.

SOURCE: **NEW QUESTION – T3, #5**

LO: 10305 With Tech Specs provided, determine LCO applicability for a given operational condition.

RATING: H3

ATTACHMENT: YES – TS Table 3.3.1.2-1

JUSTIFICATION: 2 SRMs are required in MODE 5 prior to fuel movement with all fuel still in the core. The requirement drops to 1 SRM when a spiral offload is in progress and the fueled region contains only that SRM.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #53

EXAM KEY

03/27/2003

EX03036

---

Why is a reactor scram required at high power levels when the Main Turbine Throttle Valves close?

- A. The scram reduces the chance of a turbine overspeed due to excessive steam flow through the Bypass Valves.
- B. The scram reduces the chance of a turbine overspeed due to excessive steam flow through the Moisture Separator Reheaters.
- C. A trip of the Main Turbine causes reactor pressure and power to go up, which must be limited.
- D. A trip of the Main Turbine causes reactor pressure to lower and power to rise, which must be limited.

ANSWER: C

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295005AK1.01 4.0/4.1 10CFR55.41 Knowledge of the operational implications of the following concepts as they apply to Main Turbine Generator Trip: Pressure effects on reactor power.

REFERENCE: Tech Spec Bases B 3.3.1.1 rev.24, page3.3.1.1-16 & 17

SOURCE: **NEW QUESTION – RO T1, GP1, #2**

LO: 6925 Identify the basis for any LCO.

RATING: L3

ATTACHMENT: NONE

JUSTIFICATION: As stated in the basis for the Turbine Trip LCO, the pressure and power effects on the reactor following a trip of the Main Turbine must be limited. C is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #54

EXAM KEY

03/27/2003

EX01025

---

The plant is operating at 68% power with RWCU-P-1A in service. CRD flow has to be isolated to the pump for a short period of time.

Which of the following describes the area of the pump affected by the loss of CRD flow?

- A. Cooling water to the external heat exchanger
- B. Pump pedestal heat exchanger
- C. Cavitation reduction supply
- D. Pump Motor Cavity

ANSWER: D

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295022AA1.04 2.5/2.6 10CFR55.41.7/45.6 Ability to operate and/or monitor the following as they apply to Loss of CRD Pumps: Reactor Water Cleanup System.

REFERENCE: LO000190 Reactor Water Cleanup rev. 10, page 5

SOURCE: **BANK QUESTION – 01 NRC EXAM – DIRECT –**  
RO T1, GP2, #7

LO: 5192 Describe the physical connections and/or cause and effect relationships between the CRDH System and the following:  
Reactor Water Cleanup System

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: A is incorrect because CRD does not provide cooling to the external heat exchanger. B is incorrect because it does not exist. C is incorrect because the source of the Cavitation reduction supply is from the discharge of the RWCU pump itself. D is correct. The pump motor cavity is the location that CRDH supplies.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #55

EXAM KEY

03/27/2003

EX03037

---

What is the basis for the isolation of secondary containment ventilation due to Reactor Building Exhaust Plenum High Radiation?

- A. Maintain fission product release during a Design Basis Accident to within the exposure limits of 10CFR100.
- B. Allows the Reactor Building atmosphere to be recirculated by the normal ventilation system during a Design Basis Accident.
- C. The isolation allows the Standby Gas Treatment System to vent to the atmosphere through a ground level exhaust path.
- D. Maintains the dose to an individual in the owner controlled area to less than 1.2 rem.

ANSWER: A

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295034EK3.01 3.8/4.1 Knowledge of the reasons for the following responses as they apply to High Secondary Containment Ventilation High Radiation: Isolating Secondary Containment Ventilation.

REFERENCE: Tech Spec Bases 3.3.6.2 rev. 24, page B 3.3.6.2-1

SOURCE: **NEW QUESTION – RO T1, GP2, #16**

LO: 6925 Identify the basis for any LCO.

RATING: L4

ATTACHMENT: NONE

JUSTIFICATION: As stated in the bases for TS, the purpose of the isolation is to limit the dose at the site area boundary to the limits of 10CFR100. A is correct.

COMMENTS: Changed stem.

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #56

EXAM KEY

03/27/2003

EX03038

---

The plant is in MODE 5. A full core offload is in progress. The RHR System is providing both Shutdown Cooling and Fuel Pool Cooling Assist. Temperatures in the vessel and the fuel pool are stable.

A loss of RHR-P-2A will result in which of the following conditions?

- A. Reactor temperature remains fairly constant while fuel pool temperature increases.
- B. Reactor temperature increases while fuel pool temperature remains fairly constant.
- C. Temperature remains fairly constant in both the vessel and the fuel pool.
- D. Temperature increases in both the vessel and the fuel pool.

ANSWER: B

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295021AK2.05 2.7/2.8 10CFR55.41 & 45 Knowledge of the interrelationships between Loss of Shutdown Cooling and the following: Fuel Pool Cooling and Cleanup System

REFERENCE: LO000202 FPCC rev. 10, pages 3 & 14  
ABN-FPC-ASSIST rev. 0 page 3

SOURCE: **NEW QUESTION** – RO T1, GP3, #1

LO: 5368 Explain the flow paths of the following: RHR/FPC Crosstie

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: A RHR loop provides shutdown cooling and B RHR loop provides fuel pool cooling assist. Therefore only B can be correct.

COMMENTS: Revision satisfactory.



# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #57

EXAM KEY

03/27/2003

EX03039

---

The plant is operating at 97% power. HPCS-P-1 is in operation with the suction from the CSTs via HPCS-V-1 and discharge back to the CSTs via HPCS-V-10 & 11. HPCS-V-10 & 11 start to auto close.

Which of the following caused the 10 & 11 valves to auto close?

- A. The control switch for HPCS-V-12 Minimum Flow in the open position.
- B. The control switch for HPCS-V-4 Injection valve in the open position.
- C. HPCS-V-1 CST Suction not full open.
- D. HPCS-V-15 Suppression Pool Suction not full closed.

ANSWER: D

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 209002A4.14 3.6/3.6 10CFR55.41 & 45 Ability to operate and/or monitor in the control room: Test Return Valve.

REFERENCE: LO000174 HPCS System rev. 9, pages 5-8

SOURCE: **NEW QUESTION – RO T2, GP1, #5**

LO: 5429 List the automatic initiations and interlocks associated with the following HPCS System components: e – CST test return valves.

RATING: L3

ATTACHMENT: NONE

JUSTIFICATION: Of the above listed actions, only D causes the 10 and 11 valves to close. D is correct.

COMMENTS: Corrected as suggested

**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #58

EXAM KEY

03/27/2003

EX03040

---

The CRO has gone to the back panel and placed the Mode Switch for APRM A in the count position. It indicates 105%.

How many LPRMS are assigned to APRM A?

- A. 20
- B. 21
- C. 22
- D. 23

ANSWER: B

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 215005K5.06 2.5/2.6 10CFR55.41 & 45 Knowledge of the operational implications of the following concepts as they apply to Average Power Range Monitor/Local Power Range Monitor System: Assignment of LPRMs to specific APRM channels.

REFERENCE: LR000149 APRM rev.9, pages 5 & 9

SOURCE: **NEW QUESTION – RO T2, GP1, #13**

LO: 5095 Given a list of plant systems, explain how they interrelate with the APRM system: a - LPRMs

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: As stated in the reference, there are 21 LPRMs assigned to APRM A. B is correct.

COMMENTS: Comment incorporated.

**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #59

EXAM KEY

03/27/2003

EX03041

---

Which of the following is correct concerning the RCIC Water Leg Pump during normal power operation?

RCIC-P-3 takes suction from the...

- A. Suppression Pool and discharges to the suction side of the RCIC pump.
- B. Suppression Pool and discharges to the discharge side of the RCIC pump.
- C. CSTs and discharges to the suction side of the RCIC pump.
- D. CSTs and discharges to the discharge side of the RCIC pump.

ANSWER: C

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 217000K1.08 3.3/3.4 10CFR55.41 & 45 Knowledge of the physical connections and/or cause and effect relationships between RCIC and the following: Line fill pump.

REFERENCE: M519 RCIC System rev. 84 LO000180 RCIC rev. 11, page 6

SOURCE: **NEW QUESTION – RO T2, GP1, #15**

LO: 5726 Explain the normal and test flow paths in the RCIC System.

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: As stated in the referenced system text and on M519 the normal suction for the water leg pump is from the CSTs. The discharge of the pump goes to the suction of the RCIC Pump. C is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #60

EXAM KEY

03/27/2003

EX01068

---

The plant was operating at 45% power when a lockout occurred on BKR S-2. HPCS-P-2 (HPCS Service Water Pump) did not start.

Which of the following is correct for these conditions?

- A. Trip HPCS-P-1 when it is determined unnecessary for adequate core cooling.
- B. Trip HPCS-P-1 immediately at P601.
- C. Immediately trip DG-3 at P601.
- D. Immediately trip DG-3 at the local diesel control panel.

ANSWER: D

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 2.4.24 3.3/3.7 10CFR55.41.10/45.13 Knowledge of the loss of cooling water procedures.

REFERENCE: ABN-SW rev 3, page 2

SOURCE: **BANK QUESTION – 01 NRC EXAM – DIRECT – RO T3, #13**

LO: 7846 Given an abnormal condition, identify the immediate operator actions required.

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: The only immediate action for a loss of HPCS-P-2 is to immediately trip DG-3. DG-3 has to be tripped locally at the control panel because of the auto start. D is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #61

EXAM KEY

03/27/2003

EX03042

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Both SLC System key lock switches on P603 have been taken to operate due to an ATWS. SLC-V-1A Storage Tank Outlet Valve has failed to open.

Which of the following describes the SLC System response under these conditions?

- A. Both SLC Pumps start and inject into the reactor at full system flow.
- B. Both SLC Pumps start but only inject with  $\frac{1}{2}$  system flow.
- C. SLC-P-1B only starts and injects into the reactor at full system flow.
- D. SLC-P-1B only starts but only injects with  $\frac{1}{2}$  system flow.

ANSWER: A

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 211000K3.01 4.3/4.4 10CFR55.41 & 45 Knowledge of the effect that a loss or malfunction of the Standby Liquid Control System will have on the following: Ability to shutdown the reactor in certain conditions.

REFERENCE: LO000172 SLC rev. 9, page 9

SOURCE: **NEW QUESTION** – T2, GP1, #6

LO: 5925 Describe the expected response to placing the SLC System A or B key lock switch in the Operate position.

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: Either SLC Tank Outlet valve open allows both SLC pumps to start and inject at full system flow. A is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #62

EXAM KEY

03/27/2003

EX03043

---

Plant conditions require that the Automatic Depressurization System be manually initiated by arming and depressing all four ADS sub-channels (A, B, C, & D)

Which of the following describes how ADS will respond?

ADS valves...

- A. Remain closed until the 105 second timer times out.
- B. Remain closed until reactor level goes below the confirmatory level.
- C. Immediately open if at least one low pressure ECCS Pump is operating in either division.
- D. Immediately open regardless of the operational status of the ECCS pumps in either division.

ANSWER: C

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 218000K4.02 3.8/4.0 10CFR55.41 Knowledge of ADS design features and or interlocks, which provide for the following:  
Allows manual initiation of ADS logic.

REFERENCE: LO000186 ADS rev. 9, page 4

SOURCE: **BANK QUESTION – DIRECT – SLIGHTLY MOD – LR00514**  
RO T2, GP1, #17

LO: 5070 State the interlocks that must be satisfied prior to automatic or manual initiation of ADS.

RATING: H2

ATTACHMENT: NONE

JUSTIFICATION: Pressing the arm and depress pushbuttons bypasses all logic except the ECCS pump running contact. If a low pressure ECCS pump is running with sufficient discharge pressure, the ADS valves open immediately. C is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #63

EXAM KEY

03/27/2003

EX03044

The plant is operating at 99% power when a fault causes BKR 7-1 to trip. B-7 closes and repowers the bus.

Which of the following is correct for these conditions?

MC-7B...

- A. auto repowers. CRA-FN-1A1 Lower Drywell Cooling Fan auto repowers when voltage is restored.
- B. auto repowers. CRA-FN-1A1 Lower Drywell Cooling Fan must be restarted with the control switch.
- C. must be manually repowered. CRA-FN-1A1 Lower Drywell Cooling Fan must also be restarted with the control switch.
- D. must be manually repowered. CRA-FN-1A1 Lower Drywell Cooling Fan auto repowers when voltage is restored.

ANSWER: B

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 223001K2.08 2.7/3.0 10CFR55.41 Knowledge of the electrical power supplies to the following: Containment Cooling Air Handling Units.

REFERENCE: LO000127 Primary Containment rev. 10, pages 12 & 30  
LO000182 AC Dist. rev. 12, page88 EWD 23E003

SOURCE: **NEW QUESTION – RO T2, GP1, #19**

LO: 5639 State what will cause the following components to automatically start or valves to operate: Lower drywell cooling fans.

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: MC-7B is critical and auto repowers following the closure of B-7 . CRA-FN-1A1 must be manually restarted following a trip/loss of voltage. B is correct.

COMMENTS:

**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #64

EXAM KEY

03/27/2003

EX99101

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Which of the following pieces of equipment would require independent verification for return to service?

- A. SGT-FN-1A1
- B. REA-FN-1B
- C. TOA-FN-1A
- D. WOA-FN-1B

ANSWER: A

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 2.2.13 3.6/3.8 10CFR55.41 & 45 Knowledge of tagging and clearance procedures.

REFERENCE: PPM 1.3.1 rev. 59, page 44

SOURCE: **BANK QUESTION – 99 NRC EXAM – DIRECT**  
RO T3, #6

LO: 6234 State what classification of components require independent verification of clearance order tags and when this type of verification is required.

RATING: L2

ATTACHMENT: N/A

JUSTIFICATION: Independent verification is required for safety related, fire protection and essential radwaste equipment following maintenance activities that alter normal system lineup configuration. SGT-FN-1A is the only equipment that meets this definition. A is correct.

COMMENTS:



# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #65

EXAM KEY

03/27/2003

EX03045

---

The plant is operating at 90% power with FWLC selected to 3-element control. A loss of Feedwater Heater 6A and 6B occurs which results in an increase in reactor power.

In response to the above condition, RFW-LIC-600 (RPV Master Level Controller) will cause Reactor Feed Pump speed to ...

- A. raise to match feed flow with the increased steam flow.
- B. lower to match actual RPV level with the level setpoint.
- C. raise when steam flow drops below feed flow by 2.5%.
- D. lower as the level setpoint is biased by the rising steam flow signal.

ANSWER: A

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 259002A1.03 3.8/3.8 10CFR55.41 & 45 Ability to predict and/or monitor changes in parameters associated with operating the Reactor Water Level Control System controls including: Reactor Power.

REFERENCE: ABN-POWER Rev. 2 bases 4.3.1 page 12; Systems Text SD000157 page 7

SOURCE: **NEW QUESTION**– RO T2, GP1, #24

LO: 5395 - Describe the response of the FWLC system during steady-state operation and during a change in reactor power in Single Element and Three Element Control.

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: Increasing reactor power will cause a steam flow to increase. FWLC, in 3-element control, senses this increase and attempts to match feed flow with steam flow. A is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #66

EXAM KEY

03/27/2003

EX03046

---

A plant startup is in progress. Reactor power is currently at 60%. Efforts are underway to start the second Reactor Feed Pump.

Which of the following should be performed prior to starting the second Reactor Feed Pump?

- A. Inform Operations Management of the upcoming change in system lineup.
- B. Inform Health Physics that radiological conditions may potentially change.
- C. Contact chemistry due to the GT 15% power increase that will occur.
- D. Place the Main Turbine in the Governor Valve Optimization mode of operation.

ANSWER: B

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 259002 2.1.8 3.8/3.6 10CFR55.45 Reactor Water Level Control System Ability to coordinate personnel activities outside the control room

REFERENCE: PPM 3.1.2 Rev. 57 Step 5.9.23 Page 52  
PPM 2.2.4 Rev. 39 Section 5.14 Page 51

SOURCE: **NEW QUESTION** – RO T2, GP1, #25

LO: NO LO

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: As stated in PPM 2.2.4, Health Physics should be contacted prior to the start of the feedpump due to the changing rad conditions.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #67

EXAM KEY

03/27/2003

EX03047

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The plant is in the process of a plant startup after a refueling outage. Containment inerting is in progress with oxygen content at 20% and going down slowly. In support of this evolution, the "B" Train of Standby Gas Treatment is running and is aligned to take a suction on Primary Containment only.

A malfunction in the initiation logic causes a false low reactor water level signal (Level 2) to be initiated. The "B" SGT system responds correctly.

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

The 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 lower rate because SGT-V-2B (reactor building suction) opened.
- C. go down faster due to the resulting automatic rise in SGT system flow.
- D. remain at the same value because SGT-V-1B (primary containment suction) closed.

ANSWER: D

---

QUESTION TYPE: RO/SRO  
KA # & KA VALUE: 261000K3.06 3.0/3.3 10CFR55.41 & 45 – Knowledge of the effect that a loss of the Standby Gas Treatment System will have on Primary Containment oxygen content.  
REFERENCE: PPM 2.3.5 Section 5.2 Page 12 of 27  
SOURCE: **NEW QUESTION** - RO T2, GP1, #26  
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-1B automatically closes, isolating containment. D is correct.  
COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #68

EXAM KEY

03/27/2003

EX03048

---

The plant is operating at 90% power when a small steam LOCA occurs in Primary Containment. Primary Containment pressure goes up to 4.2 psig. When the "A" train of SGT initiates, SGT-V-3A2 (SGT-FN-1A1 suction valve) fails closed. Ten minutes later, the Control Room Operator responds to the back panels.

According to PPM 2.3.5 SGT Systems, what should the system alignment be?

- A. SGT-FN-1A2 Div. 1 lag fan and SGT-FN-1B1 Div. 2 lag fan running.
- B. SGT-FN-1A1 Div. 1 lead fan and SGT-FN-1B1 Div. 2 lag fan running.
- C. SGT-FN-1A2 Div. 1 lag fan and SGT-FN-1B2 Div. 2 lead fan running.
- D. SGT-FN-1A1 Div. 1 lead fan and SGT-FN-1B2 Div. 2 lead fan running.

ANSWER: C

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 261000A2.06 2.9/2.9 10CFR55.41& 45 Ability to (a) predict the impacts of valve closures 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.

REFERENCE: PPM 2.3.5 REV. 23, page 12

SOURCE: **NEW QUESTION** – RO, T2, GP1, #27

LO: 5828 Stat the SGTR system response to an FAZ signal.

Include all major valves, heaters, and fans and their associated delay times.

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: On initiation, if the lead fan low flow (LT 750 cfm for 30 seconds) is sensed, the lead fan trips and the lag fan starts. C is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #69

EXAM KEY

03/27/2003

EX03049

---

The plant is shutting down for a planned refueling outage. Reactor power is 16%. There is an insert error on one control rod in the currently latched group. The CRO selects the next control rod and inserts it one notch past the insert limit for that group.

Which of the following is correct concerning these conditions?

- A. A control rod insert error is generated. Control rod movement may continue because RWM errors/blocks are not enforced at this power level.
- B. A control rod insert error is generated by RWM. Control rod movement may continue until one more insert error is generated.
- C. RWM generates a control rod insert error and a control rod insert block. Further control rod movement is prevented until the rod is bypassed and withdrawn one notch.
- D. RWM generates a control rod insert error and a control rod insert block. Control rod insertion is prevented until one of the two insert errors is cleared.

ANSWER: B

---

QUESTION TYPE: RO/SRO  
KA # & KA VALUE: 201006K4.01 3.4/3.5 10CFR55.41 Knowledge of Rod Worth Minimizer System design feature and/or interlocks which provide for insert blocks/errors.  
REFERENCE: LO000154 RWM rev. 10 pages 7 & 8  
SOURCE: **NEW QUESTION** – RO, T2, GP2, #2  
LO: 5915 Describe the conditions that result in: b – Insert error.  
RATING: H3  
ATTACHMENT: NONE  
JUSTIFICATION: RWM generates an insert error if a rod is inserted past its insert limit. RWM will generate a rod block if more that two insert errors exist and power is below LPSP (20%). B is correct as only two insert errors now exist and only if one more insert error is generated would a block be generated`.  
COMMENTS: Changed answer to B.

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #70

EXAM KEY

03/27/2003

EX03050

---

During the act of paralleling Breaker 7-1 with SM-7, it is noted that the blue "SYNC PERMIT" light illuminates momentarily.

When does this light illuminate?

- A. The Sync Selector Switch must be in the Manual position with all breaker closure permissives met and the breaker control switch is in the Normal After Close position.
- B. The breaker control switch is in the Close position, the Sync Selector Switch is in the Manual or Manual Check position, and all breaker closure permissives are met.
- C. Both control switches for breakers 7-1 and B-7 must be in the Normal After Close position with the individual Sync Selector Switches in the Manual Check position.
- D. Both control switches for breakers 7-1 and B-7 must be in the Close position with the individual Sync Selector Switches in the Manual position.

ANSWER: B

---

QUESTION TYPE: RO/SRO  
KA # & KA VALUE: 262001K5.01 3.1/3.4 10CFR55.41 & 45 Knowledge of the operational implications of the following concepts as they apply to AC Electrical Distribution System: Principle involved in paralleling AC sources.  
REFERENCE: LO000182 AC Distribution rev. 12, page47  
SOURCE: **BANK QUESTION – MODIFIED – RO T2, GP2, #11**  
LO: 5061 State what conditions exist when the blue "SYNC PERMIT" light next to a breaker on Board C, other than the 500KV Bkrs, is on.  
RATING: L3  
ATTACHMENT: NONE  
JUSTIFICATION: As stated in the reference, all of the following must be met before the blue "SYNC PERMIT" light illuminates: CS in Close Position, and Sync Selector Switch in Manual or Manual Check. B is correct.  
COMMENTS: Changed stem to indicate momentary illumination.

**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #71

EXAM KEY

03/27/2003

EX03051

---

Columbia Generating Station is operating at full power. The power supply fuse for "C" APRM blows.

Assuming no operator actions, an electrical fault at which of the following could cause a reactor scram?

- A. DP-S1-2A
- B. MC-7A
- C. DP-S1-2E
- D. MC-8A

ANSWER: D

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 215002K2.03 2.8/2.9 10CFR55.41 Knowledge of the electrical power supply to the following: APRM channels.

REFERENCE: LO000161 RPS rev. 11 page 19  
LO000149 APRM Rev. 9 page 29

SOURCE: **NEW QUESTION** – RO, T2, GP2, #5

LO: 5096 State the power supply to the APRM System.

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: MC-8A supplies power to 'B' RPS which powers APRMs 'B', 'D', and 'F'. Loss of the opposite side APRM would cause a full scram. D is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #72

EXAM KEY

03/27/2003

EX03052

---

The plant is operating at power with RHR B System in suppression pool cooling mode of operation. RHR-V-24B (SP cooling test return) is open and RHR-V-48B, (HX Shell Side Bypass) is closed. A series of events cause reactor level to lower.

Assuming no operator action to stop the level reduction, which range of level indication is most accurate when RHR-V-24B receives an auto close signal?

- A. Upset Range
- B. Fuel Zone
- C. Wide Range
- D. Narrow Range

ANSWER: C

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 219000K1.09 3.3/3.4 10CFR55.41 & 45 – Knowledge of the physical connection and/or cause-effect relationship between RHR/LPCI: Torus/Suppression Pool Cooling Mode and Nuclear Boiler Instrumentation.

REFERENCE: LO000126 NBI rev. 8 page 8

LO000198 RHR rev. 10 page 18.

SOURCE: **NEW QUESTION** - RO, T2, GP2, #6

LO: 5582 List the calibration conditions and nominal ranges for each of the five ranges of level instruments.

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: RHR-V-24B gets a close signal at –129 inches. At this level the Wide Range is the most accurate due to its calibration conditions. C is correct.

COMMENTS:



# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #73

EXAM KEY

03/27/2003

EX03053

The plant was operating at 98% when events occurred that caused Drywell pressure to slowly increase to 8 psig. At 2 psig Wetwell pressure, the CRS directed Wetwell spray initiation with RHR A system.

Concerning suppression pool level which of the following is correct?

- A. SP level should initially drop slightly but then should remain fairly steady.
- B. SP level will continually go down until sprays are stopped.
- C. At a SP level of -2 inches, RHR suction will realign to the CSTs.
- D. At a SP level of +2 inches, RHR suction will realign to the CSTs.

ANSWER: A

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 230000A1.06 3.3/3.3 10CFR55.41 & 45 Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI Suppression Pool Spray Mode controls including Suppression Pool level.

REFERENCE: LO000198 RHR rev. 10 page 18

SOURCE: **NEW QUESTION - RO, T2, GP2, #8**

LO: 5774 Describe the flow path within the appropriate RHR System for each of the following: d. Suppression Pool Spray

RATING: H2

ATTACHMENT: NONE

JUSTIFICATION: RHR suction is only from the SP. When sprays are initiated, some Suppression Pool inventory will be required to fill piping causing a slight level drop.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #74

EXAM KEY

03/27/2003

EX03054

---

During a plant shutdown with the RPV still pressurized, the following annunciator is received:

REACTOR BLDG EQUIP SUMP HIGH LEVEL for sump R-5 in the CRD pump room.

ARP 4.602.A.13 drop 3.1 has been entered for this annunciator.

Which of the following is the cause of this indication?

- A. Recirculation piping leak in the Drywell.
- B. MS-RV-3A seat leak.
- C. MS-V-1 and MS-V-2 Reactor Head Vents have been opened.
- D. RHR-V-24B Test Return not fully closed.

ANSWER: C

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 239001A2.09 3.4/3.7 10CFR55.41 7 45 Ability to (a) predict the impacts of opening of head vent to drywell equipment sump with pressure in the reactor vessel on the Main Steam and Reheat Steam System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations.

REFERENCE: ARP 4.602.A13 3-1 rev. 12 page 26, LO000128 Main Stem rev. 8 Figure 1 and LO000130 Plant Drain Systems rev. 8 Figure 10.

SOURCE: **NEW QUESTION - RO, T2, GP2, #9**

LO: 5526 State the purpose of the Reactor Pressure Vessel vent, where the vent can be directed to, and when each vent path is used.

RATING: H2

ATTACHMENT: NONE

JUSTIFICATION: A is incorrect because the leakage would be directed to the floor drain system. B and D are both incorrect because they discharge to the suppression pool. C is correct because the steam would condense in the EDR sump in the drywell and end up in R5 in the CRD pump room.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #75

EXAM KEY

03/27/2003

EX03055

---

A plant startup is in progress. The Main Turbine is ready to be rolled to 1800 RPM.

Why is the start of a third (3<sup>rd</sup>) CW Pump prohibited under these conditions?

- A. An undervoltage or degraded voltage on TRB occurs upon starting of the third Circulating Water Pump.
- B. An undervoltage or degraded voltage on TRS occurs upon starting of the third Circulating Water Pump.
- C. An overcurrent condition will exist. The feeder breakers for SH-5 and SH-6 will trip resulting in loss of the operating RRC pumps.
- D. An overcurrent condition will exist. The Main Turbine will trip but the reactor will not scram due to the existing power level.

ANSWER: B

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 262001A1.04 2.7/2.9 10CFR55.41 & 45 Ability to predict and/or monitor changes in parameters associated with operating the AC electrical distribution controls including load currents.

REFERENCE: LER 84-079; PPM 2.6.1 rev. 55 page8

SOURCE: **NEW QUESTION - RO, T2, GP2, #12**

LO: 5050 Describe the cause and effect relationships for: e. N and S breakers and Cond. Pumps , Cond Bstr Pumps, and Circ Water Pumps.

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: As stated in the precautions and as occurred in the plant, a start of the 3<sup>rd</sup> CW pump causes an undervoltage on TRS and a loss of the transformer. B is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #76

EXAM KEY

03/27/2003

EX03056

---

The plant is operating at 96% power. Efforts are underway to transfer IN-1 from the Maintenance Bypass Source to UPS.

Concerning the transfer, which of the following is correct?

Power is being transferred from...

- A. MC-7F to the UPS and it will be a make-before-break transfer.
- B. MC-7A to the UPS and it will be a make-before-break transfer.
- C. MC-7F, the Kirk Key interlocked breakers will be operated and it will be a break-before-make transfer.
- D. MC-7A, the Kirk Key interlocked breakers will be operated and it will be a make-before-break transfer.

ANSWER: A

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 262002A4.01 2.8/3.1 10CFR55.41 & 45 Ability to manually operate or monitor in the control room the transfer from alternative source to preferred source of the UPS power supply.

REFERENCE: PPM 2.7.4 rev. 14, pages 5, 18, & 34

SOURCE: **NEW QUESTION** - RO, T2, GP2, #13

LO: 5896 List the power supplies to each inverter.  
5890 State the purpose of the Kirk Key Interlock.

RATING: L3

ATTACHMENT: NONE

JUSTIFICATION: The MBS for IN-1 is powered from MC-7F, not MC-7A. The Kirk Key interlocked breakers are operated when transferring IN-1 from is Bypass Source, which is MC-7A and would be a break-before-make transfer.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #77

EXAM KEY

03/27/2003

EX03057

---

The plant is operating at power when a spurious fire alarm is received in the Control Room on FCP-1.

Which of the following concerning the Fire Protection system is correct?

- A. If another detector from the zone with the spurious alarm generates a fire alarm, the trouble alarm for that zone will annunciate.
- B. A sealed in spurious alarm will prevent any valid alarm from that zone from annunciating.
- C. Too many fire alarms can potentially cause a "lockup" of the fire protection control computer such that any new alarms are masked.
- D. When a fire alarm is received, all trouble and additional fire alarms in all zones throughout the plant are masked.

ANSWER: B

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 286000K3.01 3.2/3.4 10CFR55.41 & 45 Knowledge of the effect that a loss or malfunction of the Fire Protection System will have on the ability to detect fires. ()

REFERENCE: PPM 4.FCP.1 drop 1-2 rev. 11

SOURCE: **NEW QUESTION** - RO, T2, GP2, #14

LO: 7610 State the affect of a fire alarm received at the Fiore Panel has on subsequent alarms from that zone.

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: As stated in all FCP-1 ARPs. Any alarm that is sealed in masks other alarms in the same zone and prevents them from alarming. B is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #78

EXAM KEY

03/27/2003

EX03058

---

A fire exists in the reactor building. ABN-FIRE has been entered.

Concerning operability of RPV water level instruments, which of the following is correct?

- A. Per ABN-FIRE, a fire that has any effect on the operation of more than one RPV water level instrument, requires RRC flow reduction and insertion of a Reactor Scram.
- B. A fire in the area of a reference or variable leg for RPV water level instrument would actuate the associated area high temperature alarm. The associated ARP would then give the appropriate guidance for this condition.
- C. As long as temperature in the affected reference or variable leg for RPV water level does not exceed the saturation temperature of the water of the in the RPV, instrument operability need not be questioned.
- D. A fire has the potential of causing the reference or variable legs for RPV level instruments to heatup, which may cause erroneous indication of RPV level.

ANSWER: D

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 290001A2.05 3.1/3.3 10CFR55.41 & 45 Ability to (a) predict the impacts of High Area Temperature on Secondary Containment; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations.

REFERENCE: ABN-FIRE rev. 4, page 12

SOURCE: **NEW QUESTION** - RO, T2, GP2, #15

LO: 6904 Describe, with the procedures available, the reason for the requirement to consider all RPV level instruments in the affected area inoperable for a fire in that area.

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: ABN-FIRE requires that for a fire in the Sec. Containment, operability of RPV level instrumentation is considered. D is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #79

EXAM KEY

03/27/2003

EX03059

Which of the following statements describes the reason that personnel performing core alterations shall be in constant communications with the Operator-at-the-Controls?

- A. To allow the Operator-at-the-Controls to monitor for inadvertent criticality and inform the refuel floor of such event.
- B. A core alteration is considered a change in reactivity which requires the knowledge and consent of the Operator-at-the-Controls.
- C. Core alterations are considered a special evolution requiring constant communication with the Control Room using portable radios.
- D. To allow the on-duty STA to perform a shutdown margin check required during Core Alterations using portable radios.

ANSWER: A

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 290001 2.1.16 2.9/2.8 10CFR55.41 & 45 Ability to operate plant phone/ paging system, and two-way radio as it applies to the Secondary Containment.

REFERENCE: PPM 6.3.2 rev. 16, page 9 PPM 1.3.1 rev. 59 pages 22 & 23

SOURCE: **INOP EXAM BANK – MODIFIED** - RO, T2, GP2, #16

LO: 8830 Discuss what actions are required if communication is lost between the bridge and the control room during fuel shuffling.

RATING: L3

ATTACHMENT: NONE

JUSTIFICATION: B is not correct because the CRS is the reactivity manager (not the operator at the controls); C is not correct because core alts is not a special event and portable radios are not considered direct communications; D is not correct because portable radios are not considered direct communications.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #80

EXAM KEY

03/27/2003

EX03060

The plant is operating at 65% power with the following conditions:

CAS-C-1A and CAS-C-1B are running  
CAS-C-1C control switch is in STANDBY  
CJW-P-1A control switch is in AUTO  
CJW-P-1B is running

A Reactor scram then occurs and the S-1 breaker fails to close in on SM-1 resulting in a momentary loss of power to SM-1. All other plant systems functioned as designed.

Which of the following is correct concerning these conditions?

After the transient...

- A. CJW-P-1B will not be running. CJW-P-1A will start on CJW system low pressure.
- B. CJW-P-1A will have automatically started when the breaker for CJW-P-1B opened.
- C. CAS-C-1B will not be running. CAS-C-1C will start when system pressure drops to 100 psig.
- D. CAS-C-1A will not be running and will have to be reset before it can be restarted.

ANSWER: D

QUESTION TYPE: RO/SRO  
KA # & KA VALUE: 300000K6.12 2.9/2.9 10CFR55.41 & 45 Knowledge of the effect that a loss or malfunction of Breakers, Relays, and Disconnects will have on the Instrument Air System.  
REFERENCE: LO000205 CAS rev. 8, pages 14 and 22  
SOURCE: **NEW QUESTION - RO, T2, GP2, #18**  
LO: 7606 Determine the affect on CAS from the following events:  
b. Loss of offsite power.  
RATING: H2  
ATTACHMENT: NONE  
JUSTIFICATION: CAS-C-1A is powered from MC-7A and will trip on a loss of power and have to be manually reset before it can be restarted. CAS-C-1B and CJW-P-1B are powered through SM-3 and are not affected by the S-1 breaker not closing. D is correct.  
COMMENTS:



**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #81

EXAM KEY

03/27/2003

EX03061

---

Radwaste is discharging the Floor Drain Sample Tank (FDR-TK-9) to the River.

Which of the following would result in an isolation of the FDR-V-188, River Discharge Isolation Valve?

- A. The Circ Water blow down flow rate is too low.
- B. The FDR Sample Tank discharge flow rate is too low.
- C. The Floor Drain Sample Pump, FDR-P-21, discharge pressure is too low.
- D. The effluent radiation monitor high radiation setpoint is reached.

ANSWER: D

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 268000A1.02 2.6/3.6 10CFR55.41 & 45 Ability to predict and/or monitor changes in parameters associated with operating the radwaste controls including offsite release.

REFERENCE: 82-RSY-0200-T6 Processing Systems rev. 8, page 15

SOURCE: **BANK QUESTION – INPO MODIFIED SLIGHTLY –**  
RO, T2, GP3, #2

LO: 5659 State the interlocks associated with the River Discharge Isolations (FDR-V-187 & 188)

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: The river isolation valve only automatically closes if high radiation trip is reached or the other valve (FDR-V-187) is opened. D is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #82

EXAM KEY

03/27/2003

EX03062

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The plant is operating at power with ROA-FN-1A and REA-FN-1A in operation. A loss of air to ROA-V-1 (Reactor Building Supply Outboard Isolation valve) occurs causing the valve to fail closed.

Which of the following is correct concerning these conditions?

- A. Standby Gas Treatment automatically initiates and maintains secondary containment.
- B. Standby Gas Treatment is manually initiated and aligned to maintain secondary containment.
- C. ROA-FN-1A trips. ROA-FN-1B automatically starts on opposite fan low dP.
- D. ROA-FN-1A continues to run and ROA-FN-1B automatically starts on low dP.

ANSWER: B

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 288000K1.03 3.7/3.7 10CFR55.41 & 45 Knowledge of the physical connections and/or cause-effect relationship between Plant Ventilation System and Standby Gas System.

REFERENCE: ABN-CAS rev. 2, page 4  
82-RSY-1000-T6 RBHV rev. 8, page 14

SOURCE: **NEW QUESTION - RO, T2, GP3, #3**

LO: 5680 List the signals that will result in an automatic start and an automatic trip of ROA-FN-1A and 1B.

RATING: H2

ATTACHMENT: NONE

JUSTIFICATION: As stated in ABN-CAS SGT must be manually started following the loss of air. B is correct.

COMMENTS: Changed stem to make question clear.

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #83

EXAM KEY

03/27/2003

EX03063

---

A plant startup is in progress. RPV level is currently +45" and going up slowly. RPV pressure is steady at 75 psig.

Which of the following could be utilized to reduce RPV level?

- A. Let down utilizing the in-service Shutdown Cooling Loop.
- B. Reduce Control Rod Drive System drive flow.
- C. Let down utilizing the Reactor Water Cleanup System.
- D. Reduce injection with Reactor Core Isolation Cooling.

ANSWER: C

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295008AK2.09 3.1/3.1 10CFR55.41 & 45 Knowledge of the interrelationship between High Reactor Water Level and the Reactor Water Cleanup System (ability to drain).

REFERENCE: PPM 3.1.2 rev. 57, pages 19, 27, and 29

SOURCE: **NEW QUESTION** - RO, T1, GP2, #3

LO: 5033 Describe each of the following flow paths for the RWCU System: c. RPV blowdown flow path.

RATING: H2

ATTACHMENT: NONE

JUSTIFICATION: RCIC is not put into service until 125 psig RPV pressure. Shutdown Cooling is isolated before 48 psig RPV pressure. This leaves only RWCU for level control. C is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #84

EXAM KEY

03/27/2003

EX03064

---

The plant is operating at power when a steam leak inside containment develops. If drywell temperature cannot be maintained below 330°F, PPM 5.2.1, Primary Containment Control requires entry into PPM 5.1.1, RPV Control.

Which of the following is the reason for entering PPM 5.1.1?

- A. Drywell sprays may have been precluded because the pump was needed to assure adequate core cooling. Entering PPM 5.1.1 allows use to other pumps to maintain RPV level.
- B. Entry into RPV Control is explicitly stated because this allows a reactor shutdown by control rod insertion prior to RPV depressurization.
- C. PPM 5.1.1 provides the necessary directions to open the seven Safety Relief Valves, which will depressurize the RPV.
- D. Entry into RPV Control will allow the use of the EOP contingency procedure which bypasses the interlocks preventing spraying the drywell.

ANSWER: B

---

QUESTION TYPE: RO/SRO  
KA # & KA VALUE: 295012AK1.02 3.1/3.2 10CFR55.41 Knowledge of the operational implications of Reactor Power Level Control as it applies to High Drywell Temperature.  
REFERENCE: PPM 5.0.10 rev. 6, page 253  
SOURCE: **NEW QUESTION** - RO, T1, GP2, #4  
LO: 8317 Given a list, identify the statement that describes the reason for entering PPM 5.1.1 RPV Control before drywell temperature reaches 330°F.  
RATING: L2  
ATTACHMENT: NONE  
JUSTIFICATION: As stated in the reference, entry into 5.1.1 applies a reactor shutdown by control rods prior to depressurization.  
COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #85

EXAM KEY

03/27/2003

EX03065

A series of events occurred that resulted in the following plant conditions:

Suppression Pool pressure	5 psig
Suppression Pool water level	14 feet
Suppression Pool water temperature	180 °F
Drywell pressure	5 psig
Drywell temperature	145 °F
RPV pressure	1000 psig

Considering the given plant conditions, which of the following has been exceeded?

- A. SRV Tail Pipe Level Limit (SRVTPLL)
- B. RPV Saturation Temperature
- C. Primary Containment Pressure Limit (PCPL)
- D. Heat Capacity Temperature Limit (HCTL)

ANSWER: D

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295026EA2.01 4.1/4.2 10CFR55.41, 43.5, & 45 Ability to determine and/or interpret Suppression Pool Water Temperature as it applies to Suppression Pool High Water Temperature.

REFERENCE: PPM 5.0.10 rev. 6, pages 76, 93, 95, and the RPV Sat Curve from PPM 5.1.1 RPV Control.

SOURCE: **NEW QUESTION** - RO, T1, GP2, #8

LO: 8302 Given plant conditions and the HCTL Curve, determine the current operating point on the Curve within 2.5 degrees and 25 psig.

RATING: H2

ATTACHMENT: **YES** - EOP graphs Figure A (RPV Sat Curve); Fig B (PCPL); Fig C (HCTL); Fig D (SRVTPLL)

JUSTIFICATION: HCTL is exceeded due to SP temp at 180 and level at 14 feet and RPV/P at 1000#

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #86

EXAM KEY

03/27/2003

EX03066

---

The plant is operating at 98% power when a fault causes MC-8B to de-energize. Shortly after, it is reported that drywell temperature is going up slowly.

Which of the following explains the rise in drywell temperature?

There has been a reduction in the

- A. cooling that the RCC system performs due to lower RCC system flow.
- B. cooling that the RCC system performs due to the loss of TSW flow.
- C. number of drywell cooling and recirculation fans operating.
- D. number of containment cooling units due to the loss of TSW flow.

ANSWER: C

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295028EA1.02 3.9/3.8 10CFR55.41 & 45 Ability to operate and/or monitor Drywell Ventilation System as it applies to High Drywell Temperature.

REFERENCE: LO000127 PC rev. 10, page 30 & 31

SOURCE: **NEW QUESTION - RO, T1, GP2, #10**

LO: 5638 State what maintains drywell and wetwell temperature and humidity during normal plant operation.

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: MC-8B is the power supply to half the drywell cooling and recirc fans. RCC pumps are powered from SL-78/81, TSW pumps are powered from SM-75/85. The RCC pumps are cooled from RCC, and CRD, which is powered from SM-7/8. C is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #87

EXAM KEY

03/27/2003

EX03067

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PPM 5.2.1, Primary Containment Control, directs that Emergency Depressurization be performed if Wetwell Level cannot be maintained above 19'2".

What is the basis for this direction?

- A. Adequate suppression of steam discharged from the RPV cannot be assured below this level.
- B. All suppression pool temperature indication becomes invalid below this level.
- C. Scrubbing of the steam discharged from the SRVs cannot be assured below this level.
- D. Vortexes at the suction of the ECCS pumps can begin at this level and can result in air binding of the pumps.

ANSWER: A

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295030EK1.01 3.8/4.1 10CFR55.41 Knowledge of the operational implications of Steam Condensation as it applies to Low Suppression Pool Water Level.

REFERENCE: PPM 5.0.10 rev. 6, page 262

SOURCE: **NEW QUESTION** - RO, T1, GP2, #12

LO: NO LO

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: The reference states that maintenance of wetwell level greater than 19.2 feet ensures submergence of the downcomers. A is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #88

EXAM KEY

03/27/2003

EX03068

Events have occurred at the plant that have resulted in an off-site release, which is still in progress. The following Reactor Building exhaust radiation readings that have been sustained for the past 20 minutes:

PRM-RE-1B = 1.5E4 cps  
PRM-RE-1C = 1.2E3 cps

Based on the readings given, which of the following is correct?

- A. No action is required, the off-site radioactive release rate is sufficiently low that the condition does not pose a threat to public health and safety.
- B. Enter PPM 5.4.1, Radioactive Release Control, and take actions to secure Reactor Building Ventilation.
- C. Enter PPM 5.4.1, Radioactive Release Control and concurrently perform PPM 5.1.1, RPV Control and Emergency Depressurization.
- D. Enter PPM 5.4.1, Radioactive Release Control, and take actions to isolate all systems discharging into areas outside Primary and Secondary Containment.

ANSWER: D

---

QUESTION TYPE: SRO/RO  
KA # & KA VALUE: 295038EA1.01 3.9/4.2 10CFR55.41 & 45 Ability to operate and/or monitor the Stack-Gas Monitoring system as it applies to High Off-Site Release Rate.  
REFERENCE: PPM 13.1.1 rev. 31, pages 19 & 35  
PPM 5.4.1 Rad Release Control rev. 11  
SOURCE: **NEW QUESTION** - RO, T1, GP2, #17  
LO: 8017 Given plant conditions, recognize an EOP entry condition and enter the appropriate flow chart.  
RATING: H3  
ATTACHMENT: **YES** – PPM 13.1.1 and PPM 5.4.1 flow chart  
JUSTIFICATION: The indication for PRM-RE-1C exceeds the threshold for an ALERT. A rad release above the ALERT classification requires entry into PPM 5.4.1 Rad Release Control. D is correct.  
COMMENTS:



# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #89

EXAM KEY

03/27/2003

EX03069

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A fire has engulfed the H13-P601 panel. The fire has forced the evacuation of the Main Control Room. All immediate actions were performed prior to the evacuation. The Remote and Alternate Remote Shutdown Panels has been manned.

Which of the following describes a function that cannot be operated from either the Alternate or the Remote Shutdown Rooms?

- A. Cooling of the Suppression Pool with Residual Heat Removal.
- B. Cooling of Safe Shutdown components with Standby Service Water.
- C. Makeup to the reactor from Low Pressure Core Spray.
- D. Opening of up to six Safety Relief Valves for depressurizing the reactor.

ANSWER: C

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 600000AA2.17 3.1/3.6 Ability to determine and/or interpret Systems That May Be Affected By The Fire as it applies to Plant Fire On Site.

REFERENCE: LO000210 RSD rev. 5, page 3

SOURCE: **INOP EXAM BANK – MODIFIED** - RO, T1, GP2, #19

LO: 5885 List the system alignments that can be performed from the Remote Shutdown Panel and the Alternate Remote Shutdown Panel.

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: LPCS is not fire protected in the RSD, all other systems are. C is correct.

COMMENTS:

**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #90

EXAM KEY

03/27/2003

EX03070

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Concerning IRMs A, C, E, and G, which of the following causes an IRM rod block to be generated by the Reactor Manual Control System?

A loss of...

- A. RPS A.
- B. RPS B.
- C. DP-SO-B.
- D. DP-SO-A.

ANSWER: D

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 215003K1.04 2.5/2.8 10CFR55.41 & 45 – Knowledge of the physical connections and/or cause/effect relationships between Intermediate Range Monitor System and the Process Computer/performance monitoring system.

REFERENCE: SD000138 IRM rev. 8, page 19  
ARP 4.603.A-7 4-5 rev. 28 page 39

SOURCE: **NEW QUESTION**– RO, T2, GP1, #9

LO: 7637 Predict the effects that a failure of the IRM System will have on the following: b. RMCS

RATING: L3

ATTACHMENT: NONE

JUSTIFICATION: IRMs A, C, E, and G are powered from DP-SO-A and provide input to the RMCS system. D is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #91

EXAM KEY

03/27/2003

EX03071

---

Concerning the Containment Atmosphere Control (CAC) system, which of the following is correct?

- A. Excessive O<sub>2</sub> can result in a lower recombiner temperature and the possibility of catalyst poisoning.
- B. The Containment Atmosphere Control system is designed to operate at all containment pressures without adverse affects.
- C. Excessive H<sub>2</sub> can result in excessive temperature rise across the catalyst, which could result in an auto system shutdown.
- D. High containment pressure requires a lower recycle flow to maintain the proper hydrogen-oxygen mixture for recombiner operation.

ANSWER: C

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 223001K4.04 3.5/3.8 10CFR55.41 Knowledge of the Primary Containment System and auxiliaries design feature and/or interlocks, which provide for preventing hydrogen from reaching an explosive mixture.

REFERENCE: LO000133 CAC rev. 11, page 22

SOURCE: **NEW QUESTION - RO, T2, GP1, #20**

LO: 5141 Describe the physical connection and or cause and effect relationship between CAC and: a. Primary Containment.

RATING: L3

ATTACHMENT: NONE

JUSTIFICATION: As stated in the reference, hi H<sub>2</sub> can cause high catalyst temperatures resulting in a shutdown. C is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #92

EXAM KEY

03/27/2003

EX03072

---

The plant has experienced a series of events that result in an isolated ATWS. The CRO responsible for pressure control is cycling SRVs to maintain an 800-1000 psig pressure band.

As SRVs are cycled to maintain the given pressure band, which of the following RPV level responses is correct?

- A. Due to the expected feedwater level control response, RPV level will remain fairly constant during the cycling of the SRVs.
- B. The feedwater level control system senses SRV steam flow and responds by increasing feedwater flow resulting in an increase in RPV level.
- C. As the SRV is opened, RPV level goes down initially. Feedwater level control responds by increasing feedwater flow to the RPV.
- D. As the SRV is opened, RPV level goes up initially. When the SRV is closed, RPV level will initially go down.

ANSWER: D

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 239002A4.06 3.9/4.1 10CFR55.41 & 45 Ability to manually operate and/or monitor in the control room Reactor Water Level (as it applies to SRVs).

REFERENCE: CGS Simulator

SOURCE: **NEW QUESTION** – RO, T2, GP1, #22

LO:

RATING: H2

ATTACHMENT: NONE

JUSTIFICATION: A is incorrect because RPV level will not remain constant during SRV cycling. B is incorrect because SRV steam flow is not sensed by FWLC. C is incorrect due to level initially goes up. D is correct. RPV level initially goes up due to the lowering RPV pressure. When the valve is closed level drops due to the pressure rise caused by the valve closing.

COMMENTS: Rewrote question to test other knowledge.

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #93

EXAM KEY

03/27/2003

EX03073

The plant is operating at 90 % power when a single Feed Water Flow Transmitter fails UPSCALE.

What effect will this failure have on the feedwater level control system?

The Feedwater Level Control System will....

- A. recognize the failure, automatically select 1-element control and return RPV level to the level setpoint.
- B. decrease feed flow. RPV level will stabilize out at a new low level below the low level alarm setpoint.
- C. lock up the controls and hold level at the normal level, remain in 3 - element control, and actuate the RFW Control System trouble annunciator on P603.
- D. decrease feed flow until reactor level decreases to 32 inches at which time it will become level dominant remaining in 3-element control.

ANSWER: A

---

QUESTION TYPE: RO/SRO  
KA # & KA VALUE: 295009AA2.02 2.9/2.9 10CFR55.41, 43.5, & 45 Ability to determine and/or interpret Steam flow/feed flow mismatch as they apply to low reactor water level.  
REFERENCE: LO000157 FWL rev. 11, pages 19 & 20  
SOURCE: **NEW QUESTION** - RO, T1, GP1, #5  
LO: 5400 Predict the expected response of the feedwater level control system in both Single and Three Element Control, to a failure or malfunction of the following: b. Loss of Feedwater Flow Transmitter  
RATING: H2  
ATTACHMENT: NONE  
JUSTIFICATION: The system text states that the loss of a feed flow transmitter results in an immediate shift to single element. Level returns to the setpoint. A is correct.  
COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #94

EXAM KEY

03/27/2003

EX03075

---

What is basis for the Primary Containment Pressure Limit?

The Primary Containment Pressure Limit..

- A. prevents operation at containment pressures that could result in exceeding the maximum loading of structures inside containment.
- B. is determined to be the most limiting of design conditions for SRV operation so as to assure proper valve actuation.
- C. is used to preclude failure of the containment and resultant loss of systems required to maintain adequate core cooling.
- D. is a function of primary containment water level and is used to assure the pressure suppression function is maintained.

ANSWER: C

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295024EK1.01 4.1/4.2 10CFR55.41 & 45 Knowledge of the operational implications of Drywell integrity as it applies to High Drywell Pressure.

REFERENCE: PPM 5.0.10 rev. 6, page 93

SOURCE: **NEW QUESTION** - RO, T1, GP1, #8

LO: 8352 Given a list, identify the failure mode that the Primary Containment Pressure Limit is designed to prevent.

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: C is correct as stated in the reference.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #95

EXAM KEY

03/27/2003

EX03076

---

Which of the following is the basis for the ATWS Trip of the RRC Pumps?

Tripping the RRC Pumps...

- A. increases core inlet subcooling, which adds a large amount of negative reactivity quickly.
- B. voids the core, which adds a large amount of negative reactivity quickly.
- C. causes indicated reactor level to go down which results in a power reduction.
- D. causes faster control rod scram times due to less core dp resulting in quicker power reduction.

ANSWER: B

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295025EK3.02 3.9/4.1 10CFR55.41 & 45 Knowledge of the reason for Recirculation Pump Trip as it applies to High Reactor Pressure.

REFERENCE: TS Basis B 3.3.4.2 rev. 24, page B 3.3.4.2-1

SOURCE: **NEW QUESTION** - RO, T1, GP1, #9

LO: 6925 Identify the basis for any LCO

RATING: L3

ATTACHMENT: NONE

JUSTIFICATION: A is incorrect because inlet subcooling decreases. C is incorrect because indicated level increases on the pump trip. D is incorrect because the loss of RRC has no effect on control rod speed. B is correct as stated in the reference.

COMMENTS:

**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #96

EXAM KEY

03/27/2003

EX00005

---

The plant was operating at 98% when a transient occurred resulting in a scram and a large level reduction.

4 control rods failed to insert fully  
Reactor Level -172 inches

Which of the following describes the required Tech Spec actions for these conditions?

- A. Initiate action within 1 hour to restore level to greater than -129 inches.
- B. Within 1 hour, restore reactor level to greater than + 13 inches and insert all insertable control rods.
- C. Within 2 hours, restore reactor level greater than -161 inches and insert all insertable control rods.
- D. Initiate action within 2 hours to restore level to greater than -129 inches.

ANSWER: C

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 2.2.22 3.4/4.1 10CFR55.43.2 & 45 Knowledge of limiting conditions for operations and safety limits.

REFERENCE: TS 2.1 Safety Limits

SOURCE: **BANK QUESTION - 2000 NRC EXAM - DIRECT - RO T3, #7 WNP-2 IPE**

LO: 6934 State the TS requirements for Safety Limit Violations.

RATING: H3

ATTACHMENT: NONE

JUSTIFICATION: C is correct because reactor level less than TAF exceeds a Safety Limit. C is the TS requirement for exceeding the reactor level SL.

COMMENTS:



**COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE**

QUESTION #97

EXAM KEY

03/27/2003

EX03077

---

The plant was operating at 99% power when a transient occurred. The following annunciator windows were received:

RECIRC A PUMP TRIP ATWS INTIATED  
RECIRC B PUMP TRIP ATWS INTIATED

Which of the following is correct for these conditions?

- A. Reactor level lowered to -63 inches.
- B. Reactor pressure rose to 1105 psig.
- C. A reactor scram was inserted and reactor power was above 5%.
- D. RPV level was +30.5 inches with a reactor feed pump tripped.

ANSWER: A

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 295031 2.4.10 3.0/3.1 10CFR55.41, 43.5, & 45 Knowledge of annunciator response procedures as applied to low reactor level.

REFERENCE: PPM 4.602.A6 drop 1-2, rev. 14, page 4

SOURCE: **NEW QUESTION – RO T1, GP1, #11**

LO: 5423 State the signals, which cause an automatic initiation of the HPCS System.

RATING: L2

ATTACHMENT: A is correct because -63 inches exceeds the -50 inches setpoint for the trip of both RRC Pumps. B is incorrect because the setpoint for the trip of RRC pumps is 1120 psig. C is incorrect because it is the definition of an ATWS. D is incorrect because those are the signals that provide for a RRC pump runback.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #98

EXAM KEY

03/27/2003

EX03079

---

You have been directed to perform a task. Health Physics states that, "The general area radiation level is 63 mr/hr and there is loose surface contamination that measures 752 dpm/1000cm<sup>2</sup> Beta-Gamma."

How should this area be posted?

- A. Radiation Area
- B. High Radiation Area
- C. Radiation/Contaminated Area
- D. High Radiation/Contaminated Area

ANSWER: A

---

QUESTION TYPE: RO/SRO

KA # & KA VALUE: 2.3.4 2.5/3.1 10CFR55.43.4 & 45 Knowledge of radiation exposure limits and contamination control including permissible levels in excess of those authorized.

REFERENCE: SWP-RPP-01 rev. 4, page 37 and 32

SOURCE: **NEW QUESTION – RO T3, #9**

LO: 6013 Define the following terms: a. High Radiation Area  
b. Contaminated Area

RATING: H2

ATTACHMENT: NONE

JUSTIFICATION: The 63 mr/hr requires a Radiation Area posting. The 752 dpm/1000cm<sup>2</sup> does not require any special posting. A is correct.

COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #99

EXAM KEY

03/27/2003

EX03078

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Preparations are in progress for a reactor startup. The following conditions exist:

Reactor pressure	0 psig
Reactor level	+36 inches
RRC-P-1A	in operation
RHR-P-2B	in operation in Shutdown Cooling

It has been determined that Reactor beltline metal temperature does not meet the Tech Spec requirements for criticality.

Which of the following is the correct action for these conditions?

- A. Increase Reactor level to at least 80 inches.
- B. Increase Reactor blowdown through RWCU.
- C. Stop RRC-P-1A.
- D. Stop RHR-P-2B.

ANSWER: D

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QUESTION TYPE: RO/SRO  
KA # & KA VALUE: 205000K1.14 3.6/3.6 10CFR55.41 & 45 Knowledge of the physical connections and or cause-effect relationships between Shutdown Cooling System and Reactor Temperatures.  
REFERENCE: LO000198 RHR rev. 10, page 37  
SOURCE: **NEW QUESTION – RO T2, GP2, #3**  
LO: 7728 Describe the physical connections and cause-effect relationships between the RHR System and the following:  
g. RPV  
RATING: H2  
ATTACHMENT: NONE  
JUSTIFICATION: If the metal temperature does not meet the requirements for criticality, it is too cold. A, B, and C would all tend to decrease coolant temperature. D is the only choice that causes coolant temperature to increase. D is correct.  
COMMENTS:

# COLUMBIA GEN. STATION 2003 ILC WRITTEN EXAM RETAKE

QUESTION #100

EXAM KEY

03/27/2003

EX02074

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Which of the following is prevented by the performance of the PC Gas leg of PPM 5.2.1 Primary Containment Control?

- A. Damage to Standby Gas Treatment from excessive hydrogen concentration.
- B. An uncontrolled release of radioactivity to the environment.
- C. Damage to drywell equipment from drywell sprays.
- D. A failure of the drywell downcomers.

ANSWER: B

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QUESTION TYPE: RO/SRO

KA # & KA VALUE: 500000 2.3.11 2.7/3.2 10CFR55.45 – Ability to control radiation release during high containment hydrogen.

REFERENCE: PPM 5.0.10 rev. 6 page 266

SOURCE: **BANK QUESTION – 02 NRC EXAM - DIRECT –**  
RO T3, #8

LO: 8425 – Identify the possible consequence of a deflagration in containment.

RATING: L2

ATTACHMENT: NONE

JUSTIFICATION: PPM 5.0.10 states the reason/basis for the PC Gas control leg of PPM 5.2.1 is to prevent the uncontrolled release of radioactivity to the environment. B is correct.

COMMENTS: