

FACILITY NAME: HATCH

Section 2

REPORT NUMBER: 05000321/2009302 AND 05000366/2009302

## DRAFT RO WRITTEN EXAM

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- Draft RO Written Exam (75Q with ES-401-5 Information)

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### TEST REPORT

Question file: HLT 5 NRC EXAM QUESTION BANK

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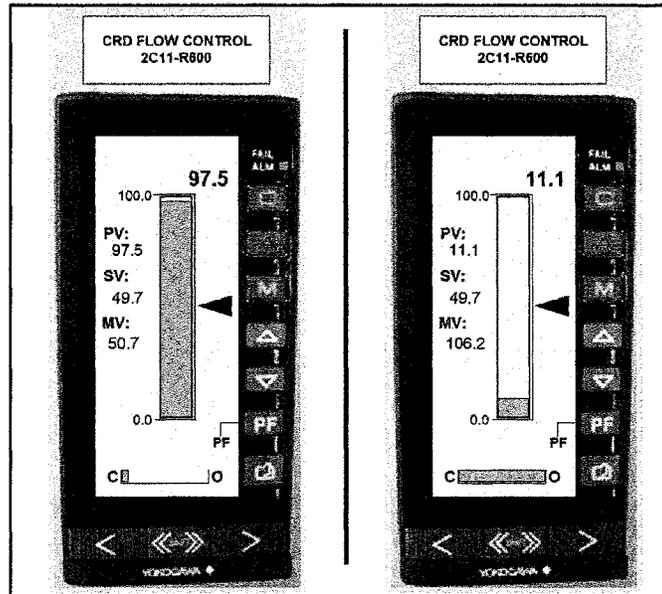
Test Path: \\leg2\SharedDocs\HLT5\Written Exam\HLT 5 NRC EXAM.LXRTest

*Rec'd  
9/10/09*

1. 201001K5.02 001/2/2/CRD/NRC 2009/HIGHER/HT2009-302/RO/ARB/CME

Unit 2 was operating at 100% power when the reactor was manually scrammed.

(Both "A" buttons are ILLUMINATED on the controllers below.)



(Figure A)

(Figure B)

Which ONE of the following choices completes the following statement?

The expected Control Rod Drive (CRD) Flow Controller flow indication IMMEDIATELY following the manual scram is shown on (1) and, based on this indication there is a potential for (2) to occur until the reactor scram is reset.

- A. (1) Figure A  
(2) CRD pump runout
- B.  (1) Figure A  
(2) excessive reactor vessel bottom head cooldown
- C. (1) Figure B  
(2) elevated CRDM temperatures
- D. (1) Figure B  
(2) low drive water differential pressure (dp)

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**Link to KA:** Tests whether the candidate understands how CRD flow indication is affected by a scram, and then asks the implications of this flow rate indication.

**B. Correct**

The charging water header taps off downstream of the CRD flow element (upstream of the CRD flow control valves, 2C11-F002A/B). When the SDV and the reactor pressures are equalized with the scram **not** reset, the charging water header will add to RPV inventory utilizing the cooling water flow path and leaking past the CRDM seals. This cooler water will cool the bottom head area and will eventually result in violation of TS cooldown rate limits.

**A. Incorrect**

1st part is correct (see "B" description)

2nd part is incorrect. **Plausible** since high flowrates are indications of pump runout. Pump runout is only prevented by use of orifices and a throttled valve in the HCU accumulator charging water header.

**C. Incorrect**

1st part is incorrect. **Plausible** since this response requires the candidate to realize which side of 2C11-F002 the flow element is on. Up stream side (with charging water header downstream of the flow element) results in a high flow indication, downstream side would result in a low flow indication.

2nd part is correct in that a low flow would cause low CRDM cooling water flow.

**D. Incorrect**

1st part is incorrect. (see "C" description).

2nd part is correct. Low flow would cause a lower drive water DP.

**Reference(s) provided to the student:**

None

**K/A: 201001K5.02 CRD Hydraulic**

Knowledge of the operational implications of the following concepts as they apply to CONTROL ROD DRIVE HYDRAULIC SYSTEM : (CFR: : : 41.5 / 45.3)

K5.02 Flow indication . . . . . 2.6 2.6

**LESSON PLAN/OBJECTIVE:**

C11-CRD-LP-00101 Control Rod Drive System lesson plan (section II.a.d, and Fig 01)

B31-RRS-LP-00401, "Reactor Recirc Lesson" (section III.K.4)

Obj 18 (EO 001.013.a.07)

**Reference(s) used to develop this question:**

**2009-301 2009 NRC EXAM Q#1**

34AB-C71-001-2, "Scram Procedure"

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2. 202001A3.04 001/2/2/RECIRC/NEW/HIGHER/HT2009-302/RO/ARB/CME

**Unit 2** is operating at 69% power with both RFPTs operating when the RFPT 2A trips.

Which ONE of the following choices completes the statement below?

After the RFPT 2A trips, the RED Recirc A & B Runback lights will be \_\_\_\_\_ (1) \_\_\_\_\_ AND alarms 602-134 "RECIRC A FLOW LIMIT" & 602-234 "RECIRC B FLOW LIMIT" will be \_\_\_\_\_ (2) \_\_\_\_\_ .

- A. (1) extinguished  
(2) alarming
- B. (1) illuminated  
(2) alarming
- C. (1) extinguished  
(2) not alarming
- D. (1) illuminated  
(2) not alarming

**Description:**

Speed Limiter #2 electronically limits the speed of the recirc pumps to 33% if the following conditions exist:

- (1) Either RFPT is less than 20% rated flow **AND** either RFPT has a trip signal from TMR **AND**
- (2) Reactor water level is less than 32 inches (low level alarm setpoint) **OR** Steam Flow is greater than 65%.

The purpose of Speed Limiter #2 is to rapidly reduce the reactor recirc flow (reactor power) following a RFPT trip, thus preventing a low RWL scram. Also illuminates **red runback light** on Speed Limiter #2 and must be manually reset if **either** of the above conditions clear (manual reset is performed on H11-P602).

Plausible since there are four different speed limiters and the red runback light will only illuminate if a #2 speed limiter is received. The candidate may also determine that since only one RFPT has tripped that only one RECIRC A or B FLOW LIMIT alarm will be received (not both).

- A. **Incorrect** - See description above.
- B. **Correct** - See description above.
- C. **Incorrect** - See description above.
- D. **Incorrect** - See description above.

**Reference(s) provided to the student:**

None

**K/A: 202001A3.04 Recirculation**

A3. Ability to monitor automatic operations of the RECIRCULATION SYSTEM including:  
(CFR: 41.7 / 45.7)

A3.04 Lights and alarms ..... 3.2 3.1

**LESSON PLAN/OBJECTIVE:**

B31-RRS-LP-00401 EO 004.001.A.07 / 004.003.A.02

**Reference(s) used to develop this question:**

34AR-602-134-2 "Recirc A Flow Limit"  
34AR-602-234-2 "Recirc B Flow Limit"

3. 202002K2.02 001/2/2/RECIRC/NEW/HIGHER/HT2009-302/RO/FNF/CME

**Unit 2** is at 100% power when a loss of 4160 Bus 2C occurs.

Assuming NO operator action, which ONE of the choices below completes the following statement?

The Reactor Recirc System \_\_\_\_\_ runback and the Reactor Recirc Pumps \_\_\_\_\_.

- A. will NOT;  
will trip immediately
- B. will NOT;  
will trip after a delay
- C.  will;  
will trip after a delay
- D. will;  
will NOT trip

**Description:**

Greater than 60% power, both RFPTs are in service. The loss of Bus 2C causes a loss of 2B RFPT oil pumps. The loss of the oil pumps causes a trip of the RFPT. The loss of the RFPT causes a #2 limiter runback to 33% (<20% flow on a RFPT with a RFPT trip).

The loss of 2C also causes a loss of 600 VAC 2R24-S013 and 2R24-S014. The loss of both 600 VAC busses causes a loss of both ASD cooling water pumps. Recirc temperatures will rise and the Recirc pumps will have a delayed trip on high temperatures of the power cells or transformer windings.

- A. **Incorrect** - a runback occurs due a 2B RFPT trip.
- B. **Incorrect** - a runback occurs due a 2B RFPT trip.
- C. **Correct** -
- D. **Incorrect** - Recirc pumps will trip on high temperatures.

**Reference(s) provided to the student:**

None

**K/A: 202002K2.02 Recirculation Flow Control**

K2. Knowledge of electrical power supplies to the following: (CFR: 41.7)

K2.02 Hydraulic power unit: Plant-Specific . . . . . 2.6 2.6

**LESSON PLAN/OBJECTIVE:**

B31-ASD-LP-0043 LT 5

**Reference(s) used to develop this question:**

Bruno comment: write question to target power supply arrangement for ASD.

B31-ASD-LP-0043  
34AB-R22-004-2

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4. 203000G2.1.31 001/2/1/RHR/MODIFIED/FUND/HT2009-302/RO/FNF/CME

**Unit 2** is in Mode 3 with the following conditions:

- o A LOCA has occurred
- o RHR "A" and "D" pumps are OFF
- o RHR "C" pump is injecting in LPCI mode
- o RHR "B" pump is running in Torus Cooling mode
- o An overcurrent condition causes Bus "F" to deenergize.

Which ONE of the choices below completes the following statement?

The operator can determine RHR LOOP flow on \_\_\_\_\_ and when the operator looks at flow will determine RHR LOOP \_\_\_\_\_ has flow.

- A. 2H11-P601;  
"A"
- B. 2H11-P602;  
"B"
- C. 2H11-P601;  
"B"
- D. 2H11-P602;  
"A"

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**Description:**

Each division of RHR has flow indication on P601. There are controls for RHR on the P602 panel. The "F" bus powers the "C" pump (Div I) and the "D" pump (Div II) so only a Div I pump is lost.

- A. **Incorrect**
- B. **Incorrect**
- C. **Correct**
- D. **Incorrect -**

**Reference(s) provided to the student:**

None

**K/A: 203000G2.1.31 RHR/LPCI: Injection Mode**

2.1.31 Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup. (CFR: 41.10 / 45.12)  
IMPORTANCE RO 4.6 SRO 4.3

**LESSON PLAN/OBJECTIVE:**

E11-RHR-LP-00701 LT 12

**Reference(s) used to develop this question:**

E11-RHR-LP-00701

5. 204000G2.4.46 001/2/2/RWCU/NEW/FUND/HT2009-302/RO/FNF/CME

Which ONE of the following valid **Unit 1** annunciators would **DIRECTLY** indicate that a RWCU automatic isolation signal has occurred?

(Assume each annunciator has been in alarm for 60 seconds)

- A.  RWCU Sys Leak (602-421)
- B. RWCU Pump High Temp Trip (602-415)
- C. RWCU Disch Press High/Low (602-409) (confirmed low pressure)
- D. Reactor Vessel Water Level High/Low (603-141) (confirmed low level)

**Description:**

- A. **Correct** - the alarm comes in at 56 gpm and, if in for 45 secs, causes an isolation.
- B. **Incorrect** - Pump Temp Hi causes a pump trip at 140 deg F RBCCW outlet. This is the same setpoint as an isolation but the trip is sensed at the pump and the isolation is sensed at the NRHX outlet.
- C. **Incorrect** - Discharge pressure Hi/Low closes the blowdown flow control valve (F033)
- D. **Incorrect** - Rx Level Hi/Low setpoint (for Low) is +32", RWCU isolates at -35"

**Reference(s) provided to the student:**

None

**K/A: 204000G2.4.46 RWCU**

2.4.46 Ability to verify that the alarms are consistent with the plant conditions.  
(CFR: 41.10 / 43.5 / 45.3 / 45.12)  
IMPORTANCE RO 4.2 SRO 4.2

**LESSON PLAN/OBJECTIVE:**

G31-RCWU-LP-00301, LT 6, 10, 11

**Reference(s) used to develop this question:**

34AR-602-904-1  
G31-RCWU-LP-00301

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6. 205000K5.03 001/2/1/RHR SDC/BANK/FUND/HT2009-302/RO/FNF/CME

**Unit 1** is in Mode 4 with Shutdown Cooling in service. The following conditions exist:

- o Recirculation Pumps....secured
- o RHR flow.....5500 gpm
- o Reactor level.....30"

IAW 34SO-E11-010-1, "Residual Heat Removal System", which ONE of the following identifies the MINIMUM corrected reactor water level that is required under these conditions?

- A. +32"
- B. +34
- C. +42"
- D.  +54"

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**Description:**

- A. **Incorrect** since this is the minimum level for the normal band of Rx Water Level prior to placing SDC in service.
- B. **Incorrect** since this is the minimum Rx Low Water Level if a Recirc Pump is operating or RHR flow is >7700 gpm.
- C. **Incorrect** since this is the maximum level for the normal band of Rx Water Level prior to placing SDC in service.
- D. **Correct** answer per 345O-E11-01 0-1.

**Reference(s) provided to the student:**

None

**K/A: 205000K5.03 Shutdown Cooling**

K5. Knowledge of the operational implications of the following concepts as they apply to SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) :  
(CFR: 41.5 / 45.3)

K5.03 Heat removal mechanisms ..... 2.8 3.1

**LESSON PLAN/OBJECTIVE:**

E11-RHR-LP-00701, LT 43

**Reference(s) used to develop this question:**

E11-RHR-LP-00701

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7. 206000K5.05 001/2/1/HPCI/BANK/FUND/HT2009-302/RO/FNF/CME

**Unit 2** was at 100% power when the following occurred:

- o DW pressure increased to 12 psig
- o HPCI started, injected and tripped on high reactor water level
- o Reactor level decreased back to +10"
- o The Shift Supervisor directed HPCI be restarted
- o The Operator pushed the "HPCI High Water Level" Reset pushbutton
- o No other operator actions are taken

Which ONE of the choices below completes the following statement?

When the HPCI High Water Level Reset pushbutton is depressed, the \_\_\_\_\_ will open and the ramp generator will cause the system to \_\_\_\_\_.

- A. 2E41-F001 "Turb Steam Supply Valve";  
maintain required speed
- B.  HPCI Turbine Stop Valve;  
maintain required speed
- C. 2E41-F001 "Turb Steam Supply Valve";  
trip on overspeed
- D. HPCI Turbine Stop Valve;  
trip on overspeed

**Description:**

On a trip, the stop valve closes but the F001 remains open. A reset causes the Stop Valve to open. With the F001 and the Stop Valve open, the ramp generator is activated and controls the increase in turbine speed. An overspeed is possible if an isolation occurs (which also causes a trip) and the steam isolation valves F002/F003 were opened last when it was unisolated. Because the F001 and Stop Valve would already be opened, the ramp generator would be at maximum (Control Valve full open) when full steam flow enters the turbine. Also on a RCIC restart, manual operator actions must be taken to prevent overspeed on a restart due to the ramp generator not being able to respond as quickly as required to prevent the overspeed.

- A. **Incorrect** - The F001 opens on a system initiation but does not close on a trip.
- B. **Correct** - See above description
- C. **Incorrect** - The F001 opens on a system initiation but does not close on a trip.
- D. **Incorrect** - The opening of the Stop Valve allows the ramp generator to activate and control speed.

**Reference(s) provided to the student:**

None

**K/A: 206000K5.05 HPCI**

K5. Knowledge of the operational implications of the following concepts as they apply to HIGH PRESSURE COOLANT INJECTION SYSTEM : (CFR: 41.5 / 45.3)

K5.05 Turbine speed control: BWR-2,3,4 ..... 3.3 3.3

**LESSON PLAN/OBJECTIVE:**

E41-HPCI-LP-00501, LT 23

**Reference(s) used to develop this question:**

INPO Exam Bank, Susquehanna 2005 NRC Exam  
E41-HPCI-LP-00501

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8. 209001K1.09 001/2/1/CS/MODIFIED/HIGHER/HT2009-302/RO/FNF/CME

Unit 1 is at 100% power. Core Spray 1E21-F004A has been stroked closed for a timing test when the following occurred:

- o An unisolable Main Steam Line break occurs
- o Reactor level..... -105", decreasing
- o Reactor pressure..... 490 psig, (Lowest reached) now slowly increasing

Which ONE of the choices below completes the following statement?

For the "A" Core Spray system, the 1E21-F004A "Outbd Discharge Valve" will \_\_\_\_\_ and the 1E21-F005A "Inbd Discharge Valve" will \_\_\_\_\_.

- A. auto open;  
auto open
- B. auto open;  
remain closed
- C. remain closed;  
auto open
- D.  remain closed;  
remain closed

**Description:**

Core Spray has an initiation signal at -101". Both the F004A and F005A get an open signal if there is an initiation signal AND pressure is less than 449 psig. Normally an interlock allows one of the valves to be manually opened if the other is closed when pressure is greater than 449 psig.

- A. **Incorrect** - this would be the lineup if pressure were less than 449 psig.
- B. **Incorrect** - this is the standby lineup which would be the status of the "B" Core Spray with the stem conditions.
- C. **Incorrect** - the F004A can't be opened with the control switch, regardless of pressure when the F005A is open. An operator may think the F004A will not auto open when the F005A is open.
- D. **Correct**

**Reference(s) provided to the student:**

None

**K/A: 209001K1.09 LPCS**

K1. Knowledge of the physical connections and/or cause-effect relationships between LOW PRESSURE CORE SPRAY SYSTEM and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8)

K1.09 Nuclear boiler instrumentation . . . . . 3.2 3.4

**LESSON PLAN/OBJECTIVE:**

E21-CS-LP-00801, LT 10

**Reference(s) used to develop this question:**

34SO-E21-001-1

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9. 209001K1.13 001/2/1/CS/NEW/HIGHER/HT2009-302/RO/ARB/CME

Unit 2 is operating at 30% RTP with the following annunciator illuminated:

RHR PUMP D TRIP	DRYWELL HIGH PRESSURE INITIATION	CORE SPRAY A JOCKEY PUMP SYS WATER LEVEL LOW	CORE SPRAY SYSTEM I ACTUATED	CORE SPRAY PUMP A TRIP	RX BLDG RADIATION HIGH
RHR PUMP D OVLDRY LOCKOUT RELAY TRIP	REACTOR LOW LEVEL INITIATION	LEAK DET A LOGIC IN TEST STATUS	CORE SPRAY SYS I LOGIC POWER FAILURE	CS PUMP A OVLDRY LOCKOUT RELAY TRIP	REFUELING FLOOR AREA RADIATION HIGH
RHR HX A DIFF PRESS LOW	REACTOR PRESS LOW 500 PSIG	LEAK DET B LOGIC IN TEST STATUS	CORE SPRAY SYSTEM I VALVES OVERLOAD	WGT BLDG RADIATION HIGH	
CNMHT SPRAY A INJECT VALVES OVERLOAD	REACTOR LEVEL LOW	LEAK DET DIFF TEMP HIGH	CORE PLATE TOP TO SPRAY HDR A DIFF PRESS HIGH	TIP MACHINE AREA RADIATION HIGH	TURBINE BLDG RADIATION HIGH
RHR SERV WTR PUMP C TRIP	RHR LOOP A JOCKEY PUMP SYS WATER LEVEL LOW	LEAK DET AMBIENT TEMP HIGH	CORE SPRAY A DISCH PIPE PRESS HIGH	MACHINE SHOP RADIATION HIGH	RADWASTE BLDG RADIATION HIGH
RHR SERV WTR PUMP C OVERLOAD	JOCKEY PUMP SYS B DISH PRESS LOW	JOCKEY PUMP SYS A DISCH PRESS LOW		MAIN STACK GAMMA RADIATION HIGH	AREA RADIATION MONITORS DOWNSCALE

P601-3

Local investigation of the alarm indicates a value on 2E21-N004A of -0.33 psid.

Which ONE of the following choices completes both the following statements?

I AW 34AR-601-322, the dP indication on 2E21-N004A \_\_\_\_\_ valid for determining Core Spray piping integrity at 30% power.

As reactor power and recirc flow is increased, 2E21-N004A indication is expected to move toward \_\_\_\_\_ psid.

- A. is  
-5.0
- B. is NOT  
-5.0
- C. is NOT  
+5.0
- D. is  
+5.0

**Description: -**

As recirc/core flow is raised from minimum to 100%, the value of the CS dp will go from a positive value to a more negative value due to the density changes of the coolant and the pitot tube effect from the tap just above the core plate. This annunciator is not valid if recirc/core flow is not at 100%. As recirc/core flow is raised to 100% the alarm will clear as the dp becomes more negative. The CS loop is considered inop if recirc/core flow is at rated and the alarm is still in.

The +5psid to -5psid are the full scale indications of the local meter.

- A. **Incorrect** - 1st part incorrect due to the dp indication will move in a more negative direction as recirc/core flow is raised  
2nd part is incorrect because with this dp indication the "A" loop of CS is inop.
- B. **Incorrect** - 1st part correct due to the dp indication moving in a more negative direction as recirc/core flow is raised  
2nd part is incorrect because with this dp indication the "A" loop of CS is inop.
- C. **Correct** - See description above
- D. **Incorrect** - 1st part incorrect due to the dp indication will move in a more negative direction as recirc/core flow is raised  
2nd part is correct because with this dp indication the "A" loop of CS is inop.

**Reference(s) provided to the student:**

None

**K/A: 209001K1.13 LPCS**

K1. Knowledge of the physical connections and/or cause effect relationships between LOW PRESSURE CORE SPRAY SYSTEM and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8)

K1.13 Leak detection . . . . . 2.8 3.0

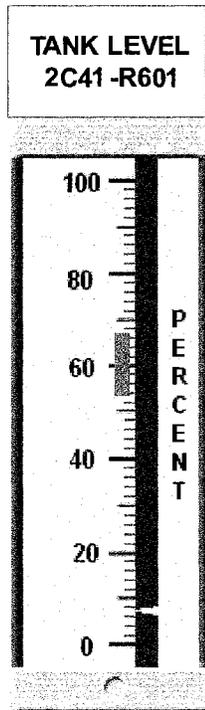
**LESSON PLAN/OBJECTIVE:**

E21-CS-LP-00801 "Core Spray System" LT \*26 EO 200.064.a.02 & 300.010.a.25

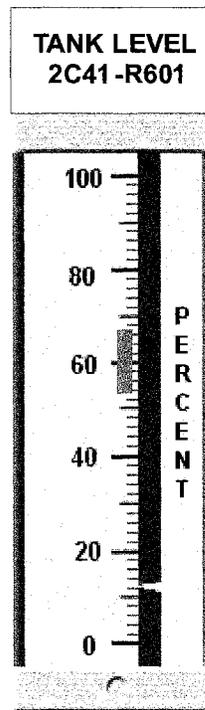
**Reference(s) used to develop this question:**

601-322 "CORE PLATE TOP TO SPRAY HDR A DIFF PRESS HIGH"  
34SV-SUV-019-2 "SURVEILLANCE CHECKS"  
TS 3.5.1 ECCS AND RCIC SYSTEM- ECCS OPERATING

Concerning the **Unit 2** Standby Liquid Control (SBLC) system:



**Figure A**



**Figure B**

Which ONE of the following completes both of these statements?

During normal operation, the means by which Sodium Pentaborate is CONTINUOUSLY maintained in solution inside the SBLC tank is by the use of \_\_\_\_\_ .

Given the two figures shown above, and that SBLC has been initiated during an ATWS, \_\_\_\_\_ indicates the HIGHEST SBLC tank level which ensures that Cold Shutdown Boron Weight has been injected into the RPV.

- A. tank heaters  
Figure A
- B. an air sparger  
Figure A
- C. tank heaters  
Figure B
- D. an air sparger  
Figure B

**Description:** The SBLC system uses tank heaters, boron concentration and water volume to maintain boron in solution. A bubbler level detector is used to determine level in the boron tank. An air sparger inside the boron tank is used to mix boron during boron addition and prior to taking samples. A caution tag is used to ensure the SBLC pump is not operated when the air sparger is in use since it will cause pump cavitation.

8% SBLC tank level corresponds to securing tank heaters  
14% SBLC tank level corresponds to Cold Shutdown boron weight.

A. **Incorrect;** see description

The 1st part is correct.

The 2nd part is **plausible** since the candidate must recall from memory the SBLC tank level that corresponds to Cold Shutdown Boron Weight vs. securing tank heaters.

B. **Incorrect;** see description.

The 1st part is **plausible** since an air sparger inside the boron tank is used to mix boron during boron addition and prior to taking samples.

The 2nd part is **plausible** since the candidate must recall from memory the SBLC tank level that corresponds to Cold Shutdown Boron Weight vs. securing tank heaters.

C. **Correct;** see description.

D. **Incorrect;** see description.

The 1st part is **plausible** since an air sparger inside the boron tank is used to mix boron during boron addition and prior to taking samples.

The 2nd part is correct.

**Reference(s) provided to the student:**

None

**K/A: 211000K4.03 SLC**

K4. Knowledge of STANDBY LIQUID CONTROL SYSTEM design feature(s) and/or interlocks which provide for the following: (CFR: 41.7)

K4.03 Keeping sodium pentaborate in solution . . . . . 3.8 3.9

**LESSON PLAN/OBJECTIVE:**

C41-SBLC-LP-01101 Standby Liquid Control lesson plan (EO 011.001.a.10)  
EOP-CURVES-LP-2306, "EOP Curves and Limits"  
EOP-CP3-LP-20327, "Level/Power Control (CP-3)" lesson plan (EO 201.092.a.02)  
EOP-RCA-LP-20328, "RPV Control - ATWS (RCA) lesson plan (EOs 201.070.a.04 & 201.071.a.18)

**Reference(s) used to develop this question:**

C41-SBLC-LP-01101  
EOP-RCA-LP-20328

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11. 212000A2.16 001/2/1/APRM/BANK/HIGHER/HT2009-302/RO/FNF/CME

**Unit 1** is shutting down for a planned maintenance outage with the following conditions present:

IRM.....Reading/Range

- A ..... 38 / R9
- B ..... 33 / R9
- C ..... 30 / R9
- D ..... 38 / R9
- E ..... 28 / R9
- F ..... 37 / R9
- G ..... 37 / R9
- H ..... 26 / R9

Which ONE of the choices below completes the following statement?

Placing the Reactor Mode Switch in the "Start/Hot Stby" position \_\_\_\_\_ cause an automatic scram signal and all Source Range Monitors \_\_\_\_\_ required to be fully inserted immediately.

- A. will;  
are NOT
- B. will;  
are
- C. will NOT;  
are NOT
- D. will NOT;  
are

**Description:**

A. Incorrect - this would be chosen if the candidate thinks the scram procedure says to insert SRMs OR IRMs (instead of AND). The stem has all IRMs on scale so they are operational.

B. Correct - there are 4 IRM.s that are above the scram setpoint (2 on Div I and 2 on Div II). The scram procedure requires SRM insertion.

C. Incorrect - selected if the candidate does not remember that the scram function of the IRMs is bypassed in RUN and re-enabled in STARTUP. Also, without a scram, there is no requirement for the SRMs to be inserted.

D. Incorrect - selected if the candidate does not remember that the scram function of the IRMs is bypassed in RUN and re-enabled in STARTUP. Also, the candidate may relate the mode switch to startup with the requirement for SRM operability (and thus insertion). This would be the case if going from SHUTDOWN to STARTUP (SRMs operable and inserted).

**Reference(s) provided to the student:**

None

**K/A: 212000A2.16 RPS**

A2. Ability to (a) predict the impacts of the following on the REACTOR PROTECTION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)

A2.16 Changing mode switch position ..... 4.0 4.1

**LESSON PLAN/OBJECTIVE:**

C51-IRM-LP-01202, LT-8

**Reference(s) used to develop this question:**

C51-IRM-LP-01202  
34AB-C71-001-1

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12. 212000A2.19 001/2/1/IRM/MODIFIED/HIGHER/HT2009-302/RO/FNF/CME

**Unit 1** is being shut down and has the following conditions:

- o Mode switch position: "Start/Hot Stby"
- o Reactor power: 6%
- o IRM "1E" is inoperative and bypassed

The "1G" IRM fails upscale.

Which ONE of the choices below completes the following statements concerning the impact of this failure on the RPS system, and an action or actions required by the applicable annunciator response procedure (ARP)?

The \_\_\_\_\_ RPS scram solenoids will de-energize.

IAW with the applicable ARP, the operator is required to \_\_\_\_\_.

- A.  "A";  
run an OD-7, Control Rod Position, on the process computer
- B. "A";  
bypass IRM "1G" and reset the half-scam
- C. "B";  
run an OD-7, Control Rod Position, on the process computer
- D. "B";  
bypass IRM "1G" and reset the half-scam

---

**Description:**

The "A" side IRMs are A, C, E & G. An upscale failure on any of these cause the "A" scram solenoids to de-energize.

Annunciator REACTOR AUTO-SCRAM SYSTEM A TRIP (603-117) alarms and directs, if possible, to bypass the IRM and reset the half scram. This is not possible with IRM E already in bypass. It also directs running of an OD-7 on the process computer (which is possible).

- A. **Correct**
- B. **Incorrect**
- C. **Incorrect**
- D. **Incorrect**

**Reference(s) provided to the student:**

None

**K/A: 212000A2.19 RPS**

A2. Ability to (a) predict the impacts of the following on the REACTOR PROTECTION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)

A2.19 Partial system activation (half-SCRAM) . . . . . 3.8 3.9

**LESSON PLAN/OBJECTIVE:**

C51-IRM-LP-01202, LT 8

**Reference(s) used to develop this question:**

- 34AR-603-117-1
- 34AR-603-203-1
- C51-IRM-LP-01202

13. 214000K1.04 001/2/2/RPIS RMC/BANK/FUND/HT2009-302/RO/FNF/CME

**Unit 1** is at 5% power, in a plant startup, with Control Rod 26-35 Selected, when the following occurs:

- o The "FOUR ROD DISPLAY" on 1H11-P603 panel goes blank for all 4 rods
- o All "Full-In" and "Full-Out" lights on the Full Core Display extinguish
- o RPIS INOPERATIVE prints out on process computer alarm typer

Which ONE of the following is correct regarding the RWM/RMCS response to this event?

- A. ONLY a Withdraw block will exist. Control Rod 26-35 will remain Selected.
- B. ONLY a Withdraw block will exist. Control Rod 26-35 will NOT be Selected.
- C. A Withdraw and Insert block will exist. Control Rod 26-35 will remain Selected.
- D.  A Withdraw and Insert block will exist. Control Rod 26-35 will NOT be Selected.

**Description:**

The RWM will apply both withdraw and insert blocks for a failed rod position. Also, a RPIS inop will result in a RMCS select block.

- A. Incorrect since an insert block is also initiated due to RPIS failure and the rod is deselected.
- B. Incorrect since a insert block is also initiated due to RPIS failure.
- C. Incorrect since the select block deselects the control rod.
- D. Correct answer.

**Reference(s) provided to the student:**

None

**K/A: 214000K1.04 RPIS**

K1. Knowledge of the physical connections and/or causeeffect relationships between ROD POSITION INFORMATION SYSTEM and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8)

K1.04 RMCS: Plant-Specific . . . . . 3.2 3.2

**LESSON PLAN/OBJECTIVE:**

C11-RWM-LP-05403. LT 11  
C11-RMC-LP-05401, LT 17

**Reference(s) used to develop this question:**

34AB-C11-002-1  
C11-RWM-LP-05403

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14. 215003A1.04 001/2/1/IRM/NEW/HIGHER/HT2009-302/RO/FNF/CME

**Unit 2** is in a reactor startup with the following conditions:

- o Mode Switch in Startup
- o All SRMSs and IRMs fully inserted
- o Control Rods are being withdrawn
- o All IRMs are reading mid-scale on ranges 1 or 2 except:
  - IRM "C" is on range 1 and reading 32
  - IRM "D" is on range 2 and reading 12
  - IRM "H" is bypassed, with the module unplugged, for I&C work
- o Annunciator "Rod Out Block" (603-238) is in alarm

Which ONE of the choices below answers the following statement?

The "Rod Out Block" annunciator would clear if the operator ranged \_\_\_\_\_ OR \_\_\_\_\_.

- A.  IRM "C" to range 2;  
bypassed IRM "C"
- B. IRM "C" to range 2;  
placed the mode switch in RUN
- C. IRM "D" to range 1;  
bypassed IRM "D"
- D. IRM "D" to range 1;  
placed the mode switch in RUN

**UPDATE  
DONE - ARB**

---

**Description:**

The IRMs provide a rod block on upscales of 80 (on even ranges) or 25.6 (on odd ranges). A downscale rod block occurs at 10 (on even ranges) or 3.2 (on odd ranges). Only 1 IRM from the "A" side (A,C,E,G) and 1 IRM from the "B" side (B,D,F,H) can be bypassed.

- A. **Correct** - IRM is giving a Rod Block therefore ranging to 2 OR bypassing the IRM will clear the alarm.
- B. **Incorrect**- 1st part is correct;  
2nd part is incorrect because placing the mode switch to run will bypass all IRMs rod blocks, it would not clear the alarm because an APRM downscale rod block will exist from low power.
- C. **Incorrect** - IRM is not causing a rod block (comes in at 10 or less). Ranging down to range 1 will bypass the downscale rod block for this IRM. The IRM could not be bypassed since there is one already bypassed on the "B" side.
- D. **Incorrect** - IRM is not causing a rod block (comes in at 10 or less). Ranging down to range 1 will bypass the downscale rod block for this IRM. Placing the mode switch in RUN would cause an APRM downscale rod block from low power.

**Reference(s) provided to the student:**

None

**K/A: 215003A1.04 IRM**

A1. Ability to predict and/or monitor changes in parameters associated with operating the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM controls including: (CFR: 41.5 / 45.5)

A1.04 Control rod block status ..... 3.4 3.4

**LESSON PLAN/OBJECTIVE:**

C51-IRM-LP-01202, LT 9

**Reference(s) used to develop this question:**

C51-IRM-LP-01202

**Unit 2** is in a refueling outage.

Plant conditions:

- o Source Range Monitor (SRM) Shorting Links are REMOVED
- o A detector short causes the SRM "A" counts per second (CPS) to begin to slowly increase

Which ONE of the choices below completes the following statement?

The SRM RPS Upscale Trip set point is \_\_\_\_\_ and a trip in RPS channel(s) \_\_\_\_\_ will occur when this setpoint is exceeded..

- A.  $7 \times 10^4$  cps;  
"A" (ONLY)
- B.  $3 \times 10^5$  cps;  
"A" (ONLY)
- C.  $7 \times 10^4$  cps;  
"A" and "B"
- D.  $3 \times 10^5$  cps;  
"A" and "B"

**Description:** SRM high ( $3 \times 10^5$  CPS ) will result in an Upscale trip input due to RPS with the shorting links removed.

Normally any single neutron monitoring trip doesn't cause a full scram. However, with the shorting links removed, any neutron monitoring system (at the trip setpoint) will cause a full scram.

During performance of 57SV-C51-014-2, SRM FT, the trip logic operability is verified by I & C, but only a half scram is generated during the surveillance due to I & C installing jumpers to prevent a full scram. Therefore, most operators have only seen a half scram generated with the shorting links removed and the SRMs in the tripped condition.

A  $7 \times 10^4$  cps signal causes the Upscale alarm.

- A. **Incorrect;**
- B. **Incorrect;**
- C. **Incorrect;**
- D. **Correct;**

**Reference(s) provided to the student:**

None

**K/A: 215004K6.04 Source Range Monitor (215004K6.04 REJECTED BY US / REPLACED BY BRUNO WITH 215004K6.04 ON 6/26/09)**

K6. Knowledge of the effect that a loss or malfunction of the following will have on the SOURCE RANGE MONITOR (SRM) SYSTEM : (CFR: 41.7 / 45.7)

K6.04 Detectors ..... 2.9 2.9

**LESSON PLAN/OBJECTIVE:**

C51-SRM-LP-01201, LT-9

**Reference(s) used to develop this question:**

C51-SRM-LP-01201

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16. 215005A1.04 001/2/1/APRM RECIRC/NEW/HIGHER/HT2009-302/RO/ARB/CME

**Unit 2** is operating at 90% power and 90% core flow

A malfunction occurs on Recirc ASDs which causes core flow to increase to 100%.

Which ONE of the following will be the new Simulated Thermal Power trip setpoint for APRMS?

- A. 104%
- B. ✓ 110%
- C. 112.5%
- D. 116%

---

**Description:**

The APRMs have a flow biased scram setpoint and a Rod Block setpoint which are calculated using the following calculation:

$$\text{"Scram"} = 0.57W + 53\% - .58 \text{ delta } W$$

$$\text{"Rod Block"} = 0.63 + 41\% - 0.63 \text{ delta } W$$

Where W is the total Recirc drive flow and delta W is the difference between flow for single and dual loop operation. Since dual loops remain in service this value will be "0".

At 100% core flow the APRM Simulated Thermal Power trip setpoint will be;  
 $0.57(100) + 53\% - 0 = 110\%$ .

- A. **Incorrect** -  $104\% = 0.63(100) + 41\%$  which is the Rod Block value.
- B. **Correct** - See description above.
- C. **Incorrect** - 112.5% is the clamped APRM Simulated Thermal Power trip setpoint.
- D. **Incorrect** - 116% setpoint is reached if you use parts of both formulas ie.  $0.63W + 53\%$ .

**Reference(s) provided to the student:**

**Calculator Required**

**K/A: 215005A1.04 APRM / LPRM**

A1. Ability to predict and/or monitor changes in parameters associated with operating the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM controls including: (CFR: 41.5 / 45.5)

A1.04 SCRAM and rod block trip setpoints . . . . . 4.1 4.1

**LESSON PLAN/OBJECTIVE:**

C51-PRNM-LP-01203, EO 012.003.D.01

**Reference(s) used to develop this question:**

- C51-PRNM-LP-01203
- 34AR-603-210-2, "APRM/OPRM TRIP"
- 34AR-603-219-2, "APRM UPSCALE"

17. 215005A1.05 001/2/1/APRM/MODIFIED/HIGHER/HT2009-302/RO/FNF/CME

**Unit 2** is starting up with the Reactor Mode Switch in the START/HOT STBY position.

The following is the present status of APRM "D":

- Indicated Power Level ..... 9%
- Level D LPRM Inputs ..... 5
- Level C LPRM Inputs ..... 4
- Level B LPRM Inputs ..... 4
- Level A LPRM Inputs ..... 3

Which ONE of the following identifies the ROD OUT BLOCK (603-238) alarm status based on the current status of APRM "D"?

- A. APRM "D" is causing a ROD OUT BLOCK alarm due to too few LPRM inputs per level.
- B. APRM "D" is causing a ROD OUT BLOCK alarm due to too few total LPRM inputs.
- C. APRM "D" is causing a ROD OUT BLOCK alarm due to high power.
- D. APRM "D" is NOT causing a ROD OUT BLOCK alarm.

---

**Description:**

The APRM count circuit generates a rod block alarm if there is less than (for each APRM) 17 LPRMs total or 3 per level.

- A. **Incorrect** - the lowest level has 3 LPRMs (less than 3 would cause a rod block)
- B. **Correct** - has 16 LPRM inputs (1 less than minimum)
- C. **Incorrect** - a high power rod block is caused at 10% power.
- D. **Incorrect** - a rod block is generated with less than 17 LPRM inputs.

**Reference(s) provided to the student:**

None

**K/A: 215005A1.05 APRM / LPRM**

A1. Ability to predict and/or monitor changes in parameters associated with operating the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM controls including: (CFR: 41.5 / 45.5)

A1.05 Lights and alarms . . . . . 3.3 3.2

**LESSON PLAN/OBJECTIVE:**

C51-PRNM-LP-01203, LT 3.b.2, LT 10

**Reference(s) used to develop this question:**

C51-PRNM-LP-01203

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18. 216000A2.10 001/2/2/LEVEL ED/NEW/HIGHER/HT2009-302/RO/FNF/CME

**Unit 2** is at 100% power when the following occurs:

- o A Loss of DW chillers occurs
- o DW pressure (peak) ..... 2.1 psig
- o DW temperature (peak) ..... 155°F
- o Reactor Pressure ..... Controlled by LLS
- o A Torus leak develops
- o Emergency Depressurization is required due to the torus leak
- o When 7 SRVs are initially opened, level swell causes level to rise to +40"
- o When the RHR injection valves automatically open, level is stable at +9"

IAW 34AB-B21-002-2 "RPV Water Level Corrections," which ONE of the choices below completes the following statements?

When the 7 SRVs are initially opened, reactor water level (RWL) may be monitored with the (1) RWL instruments.

When the RHR injection valves automatically open, RWL may be monitored with (2) RWL instruments.

- A. (1) Narrow and Wide Range;  
(2) ONLY the Wide Range
- B. (1) Narrow and Wide Range;  
(2) ONLY the Narrow Range
- C. (1) ONLY the Wide Range ;  
(2) Narrow and Wide Range
- D. (1) ONLY the Narrow Range ;  
(2) Narrow and Wide Range

**Description:**

The 34AB-B21-002-2 procedure cautions that when reactor pressure is less than 500 psig, that Wide Range can not be used during rapid RPV depressurizations. The RHR injection valves come open at 425 psig, thus Wide Range can not be used at that point.

- A. **Incorrect** - would be selected if candidate confuses which range is used when less than 500 psig (i.e. thinks caution applies to Narrow Range rather than Wide Range).
- B. **Correct** - see description above
- C. **Incorrect** - would be selected if candidate thinks caution applies to pressure GREATER than 500 psig (i.e. don't use wide range if greater than 500 psig)
- D. **Incorrect** would be selected if candidate thinks caution applies to pressure GREATER than 500 psig (i.e. don't use wide range if greater than 500 psig) AND candidate confuses Wide Range with Narrow Range

**Reference(s) provided to the student:**

None

**K/A: 216000A2.10 Nuclear Boiler Inst.**

A2. Ability to (a) predict the impacts of the following on the NUCLEAR BOILER INSTRUMENTATION ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)

A2.10 Rapid vessel depressurizations . . . . . 3.3 3.5

**LESSON PLAN/OBJECTIVE:**

B11-RXINS-LP-04404, LT 17, 18

**Reference(s) used to develop this question:**

B11-RXINS-LP-04404  
34AB-B21-002-2

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19. 217000K2.03 001/2/1/RCIC/NRC 2009/FUND/HT2009-302/RO/ARB/CME

Which ONE of the following is the power supply to the **Unit 2** RCIC flow controller?

- A. Vital AC (2R25-S063)
- B. ✓ DC Cabinet "2A" (2R25-S001)
- C. Instrument Bus "2A" (2R25-S064)
- D. Reactor Bldg ESS MCC "2B" (2R24-S022)

---

**Description:** The RCIC controller is supplied AC power via an inverter from 125V DC Cabinet "2A".

- A. **Incorrect;** see description above  
**Plausible** since Vital AC supplies power so many Control Room instruments. Battery provides backup.
- B. **Correct,** see description above
- C. **Incorrect,** see description above  
**Plausible** since Instrument Bus "2A" supplies logic power for RCIC at the RSDP.
- D. **Incorrect,** see description above  
**Plausible** since this bus supplies HPCI components (including the HPCI flow controller via 2R24-S002) and can be confused by the candidate. If this were changed to Reactor Bldg ESS MCC "2A" (2R24-S021) it would be a correct answer.

**Reference(s) provided to the student:**

None

**K/A: 217000K2.03 RCIC**

K2. Knowledge of electrical power supplies to the following: (CFR: 41.7)

K2.03 RCIC flow controller . . . . . 2.7\* 2.8

**LESSON PLAN/OBJECTIVE:**

E41-HPCI-LP-00501 HPCI lesson plan

**Reference(s) used to develop this question:**

**2009-301 2009 NRC EXAM Q#18**

- 34AR-602-319-2 RCIC Inverter K603 Power Failure
- 34AB-R25-002-2 Loss of Instrument Buses
- 34AB-R25-001-2 Loss of Vital AC Bus

20. 218000K1.06 001/2/1/ADS/MODIFIED/HIGHER/HT2009-302/RO/ARB/CME

**Unit 2** has experienced a Loss of Offsite Power (LOSP).

The following conditions existed at 15:00:

- o Reactor..... All rods in
- o RPV Pressure..... 860 psig controlled by LLS
- o RWL..... -93 inches, decreasing at 2 inches/minute
- o Drywell Pressure..... 0.6 psig, increasing at 0.05 psi/minute
- o ADS Inhibit Switches..... "Normal" position

Which ONE of the following identifies the EARLIEST time when the ADS valves will automatically open?

- A. 15:04
- B. 15:06
- C. 15:15
- D. 15:17

Refer to logic drawing provided as a reference for developing this test item.

**Description:** The 102.5 second timer began timing as soon as the following conditions existed concurrently: RPV level <-101" and the 11 minute timer timed out (total time before ADS valves opening is 13 minutes). The low pressure ECCS confirmatory pressure was met at 1504 when RPV level reached -101". The 11 minute and 102.5 sec timers must be timed out in order for the ADS valves to auto open.

A. **Incorrect;** see description above

**Plausible** if the candidate assumes the that ADS permissives are met in 4 minutes (based on RPV level rate) causing the ADS valves to auto open.

B. **Incorrect;** see description above

**Plausible** if the candidate assumes the permissives for the starting of the 102.5 sec timer have been met in 4 minutes (based on RPV level rate) therefore causing the ADS valves to auto open at time 15:06.

C. **Incorrect;** see description above

The 11 minute timer initiated and sealed in as soon as RPV level dropped below -101".

**Plausible** if the candidate assumes the 102.5 second timer and the 11 min. timer are timing concurrently.

D. **Correct;** see description above

**Reference(s) provided to the student:**

None

**K/A: 218000K1.06 ADS**

K1. Knowledge of the physical connections and/or cause effect relationships between AUTOMATIC DEPRESSURIZATION SYSTEM and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8)

K1.06 Safety/relief valves ..... 3.9\* 3.9\*

**LESSON PLAN/OBJECTIVE:**

B21-ADS-LP-0381 "Auto Depress System" EO 038.004.a.02

B21-ADS-03801 Fig 2 & Fig 4

**Reference(s) used to develop this question:**

34SO-B21-001-2, "ADS and LLS System" procedure

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21. 223002K3.21 001/2/1/TIP/NEW/HIGHER/HT2009-302/RO/FNF/CME

**Unit 2** is at 100% power with the following conditions:

- o The STA is running the "D" TIP machine
- o "D" TIP is moving into the mid-core region
- o All other TIP machines are in their normal standby configuration per 34SO-C51-001-0, "TIP System Operation", section 7.4, System Restoration
- o 2R25-S103, breaker 40, trips and all "D" TIP movement stops
- o A steam line break in the DW occurs
- o DW pressure is 2.2 psig and increasing
- o TIP area rad monitor 2D21-K601F is reading 700 mr/hr and increasing
- o An SO reports steam coming from the TIP room

The status of the TIP machines is that \_\_\_\_\_ and the operator should \_\_\_\_\_.

- A. ALL TIP ball valves are open;  
immediately fire all shear valves
- B.  ONLY the "D" TIP ball valve is open;  
immediately fire TIP "D" shear valve ONLY
- C. ALL TIP ball valves are open;  
fire all TIP shear valves ONLY when radiation levels reach 1,000 mr/hr
- D. ONLY the "D" TIP ball valve is open;  
fire "D" TIP shear valve ONLY when radiation levels reach 1,000 mr/hr

**Description:**

Per 34SO-C51-001-0, "TIP System Operation", section 7.4, System Restoration, a TIP is allowed to decay in the PARKED condition (ball valve open) and then fully retracted to the IN SHIELD location (ball valve closed). So only the "D" TIP ball valve is open to run the machine. At 1.85 psg the TIP machine gets an isolation signal but, with a loss of power, can not retrace and close the ball valve.

The loss of power to 2R25-S103, breaker 40, only affects the "D" TIP but 2R25-S103 supplies power to all the TIP machines.

The increasing DW pressure and local rad levels indicate a leak through the open TIP ball valve and 34AB-C71-001-2, Attachment 1 step 2.3 requires the "D" shear valve to be fired.

A. **Incorrect** - operator would select this if he thought the standby lineup for TIP was ball valve open, and due to the loss of power all ball valves remain open requiring shear valve operation.

B. **Correct** - see above

C. **Incorrect** - operator would select this if he thought the TIP ball valves are normally open and remember that the TIP rad monitor is an EOP SC monitor that, at 1,000 mr/hr exceeds the Max Safe value.

D. **Incorrect** - the operator might select this because the TIP rad monitor is an EOP SC monitor that, at 1,000 mr/hr exceeds the Max Safe value.

**Reference(s) provided to the student:**

None

**K/A: 223002K3.21 PCIS/Nuclear Steam Supply Shutoff**

K3. Knowledge of the effect that a loss or malfunction of the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF will have on following:  
(CFR: 41.7 / 45.4)

K3.21 Traversing in-core probe system ..... 2.6 2.7

**LESSON PLAN/OBJECTIVE:**

**Reference(s) used to develop this question:**

34SO-C51-001-0, Attachment 5  
34AB-C71-001-2, Attachment 1 step 2.3

22. 233000K4.06 001/2/2/FPC/BANK/FUND/HT2009-302/RO/FNF/CME

**Unit 1** is in a refueling outage when a rupture of the Fuel Pool Cooling and Cleanup (FPCC) return line to the fuel pool occurs.

Which ONE of the following design features will minimize the inventory loss from the Fuel Pool?

- A.  The Anti-Siphon check valves on the return lines re-position.
- B. The Fuel Pool Cooling Pumps trip on low fuel pool level.
- C. The Diffusers on the return lines become uncovered.
- D. The Fuel Pool Cooling Demineralizers isolate on low fuel pool level.

**Description:**

Anti-syphon check valves are located near the top of the return line. As fuel pool level drops, the check valves reposition to prevent drawing of fuel pool water into the break..

A. **Correct** - see above

B. **Incorrect** - the pumps draw water from the surge tanks and not directly from the fuel pool. If surge tank level was decreasing (which it would with a return line break) the pumps would trip on low suction pressure but not on fuel pool level.

C. **Incorrect** - the diffusers lie at the bottom of the fuel pool. If the anti-syphon valves fail, the diffusers would not be uncovered until the fuel pool was nearly drained. The Decay Heat Removal System does have a holed diffuser to prevent siphoning.

D. **Incorrect** - the demins go into hold on low flow conditions but do not isolate on low level. (RWCU demins/system isolates on a low reactor water level).

**Reference(s) provided to the student:**

None

**K/A: 233000K4.06 Fuel Pool Cooling/Cleanup**

K4. Knowledge of FUEL POOL COOLING AND CLEAN-UP design feature(s) and/or interlocks which provide for the following: (CFR: 41.7)

K4.06 Maintenance of adequate pool level . . . . . 2.9 3.2

**LESSON PLAN/OBJECTIVE:**

G41-FPC-LP-04501, LO 1

**Reference(s) used to develop this question:**

G41-FPC-LP-04501  
2002 NRC Perry Exam, modified 2 distractors for plausibility

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23. 234000K3.04 001/2/2/REFUEL/NEW/FUND/HT2009-302/RO/FNF/CME

**Unit 2** is in a refueling outage with the following conditions:

- o Refueling grapple has latched a bundle in the core
- o Refueling platform air compressor line breaks
- o Refueling platform air pressure is 0 psig

Which one of the choices below completes the following statement?

The latched bundle \_\_\_\_\_ be unlatched and/but the grapple \_\_\_\_\_ be raised.

- A. can;  
can
- B. can;  
can NOT
- C.  can NOT;  
can
- D. can NOT;  
can NOT

---

**Description:**

The grapple hook is air operated and fails closed on loss of air. The telescope portion of the grapple is driven by an electric motor.

- A. **Incorrect**
- B. **Incorrect**
- C. **Correct**
- D. **Incorrect**

**Reference(s) provided to the student:**

None

**K/A: 234000K3.04 Fuel Handling Equipment**

K3. Knowledge of the effect that a loss or malfunction of the FUEL HANDLING EQUIPMENT will have on following: (CFR: 41.7 / 45.4)

K3.04 †core modifications/alterations ..... 2.9 3.8

**LESSON PLAN/OBJECTIVE:**

F15-RF-LP-04502, LT 3

**Reference(s) used to develop this question:**

F15-RF-LP-04502

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24. 239002A3.05 001/2/1/SRV/MODIFIED/HIGHER/HT2009-302/RO/FNF/CME

**Unit 2** is in an ATWS with the following conditions:

- o Reactor Power.....20%
- o Reactor Pressure.....1125 psig, (highest reached)
- o MSIVs.....Closed
- o Torus temp.....105°F, rising

Which ONE of the choices below completes BOTH the following statements?

With no operator action, the MAXIMUM number of SRV's that will be open is \_\_\_\_\_ .

LAW 34AB-T23-003-2, "Torus Temperature Above 95 Degrees F", \_\_\_\_\_ loop(s) of RHR should be placed in Torus Cooling to control torus temperature.

- A. 8;  
1
- B. 8;  
2
- C. 4;  
1
- D. 4;  
2

**UPDATE  
DONE - ARB**

---

**Description:**

4 SRV's should be open at 1120 psig per electrical setpoint. Each SRV can handle 7-8% steam load. With reactor power between 20-25%, pressure will be reduced with 4 SRVs opening (all 8 SRVs would open if pressure rose to 1130 psig).

34AB-T23-003-2 directs when Torus temp exceeds 95°F place one loop in Torus cooling and when Torus temp exceeds 100°F place all available RHR loops in Torus Cooling. Since Torus temp is 105°F, two loops of RHR will be placed in Torus Cooling.

- A. **Incorrect** - See description above.
- B. **Correct** - See description above.
- C. **Incorrect** - See description above.
- D. **Incorrect** - See description above.

**Reference(s) provided to the student:**

None

**K/A: 239002A3.05 SRVs**

A3. Ability to monitor automatic operations of the RELIEF/SAFETY VALVES including:  
(CFR: 41.7 / 45.7)

A3.05 Suppression pool temperature ..... 4.1\* 4.2\*

**LESSON PLAN/OBJECTIVE:**

EOP-PC-LP-20310, LT26, LT28  
B21-SLLS-LP-01401, TO 014.003.A, LT7, LT9

**Reference(s) used to develop this question:**

EOP-PC-LP-20310  
B21-SLLS-LP-01401

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25. 241000A1.24 001/2/2/MAIN TURBINE/NEW/FUND/HT2009-302/RO/ARB/CME

**Unit 2** is operating at 23% reactor power. Operators are in the process of starting up the Main Turbine. The Main Turbine is on turning gear.

Which ONE of the choices below completes the following statements?

IAW 34SO-N30-001-2, "Main Turbine Operation" section 7.1.5, "Turbine Roll And Initial Loading", the \_\_\_\_\_ is required to be used for monitoring Eccentricity on the Main Turbine.

The first speed selected for the Initial Turbine walkdown is "Speed Cmd RPM" \_\_\_\_\_ .

- A. HMI Screen;  
LOW (100)
- B. HMI Screen;  
MED (800)
- C. 2N32-R609, "TURBINE METAL EXPANSION/TEMP" recorder;  
MED (800)
- D. 2N32-R609, "TURBINE METAL EXPANSION/TEMP" recorder;  
LOW (100)

**Description:**

34SO-N30-001-2, "Main Turbine Operation" section 7.1.5, "Turbine Roll And Initial Loading", states the requirement for monitoring Eccentricity is on HMI screens - "Aux" - "Trends" - "Eccent" - "Speed".

Step 7.1.5.36.5 states "ENTER Speed Cmd RPM Low (100)...." for initial turbine roll.

Using 2N32-R609, "TURBINE METAL EXPANSION/TEMP" recorder is plausible because it does monitor turbine vibration and is located on the 2H11-P650 panel

Med (800) rpm is plausible because it is the next desired speed if a walkdown is desired. Since no additional walkdowns are desired, the Med and High rpms will not be selected.

- A. **Correct** - See description above.
- B. **Incorrect** - See description above.
- C. **Incorrect** - See description above.
- D. **Incorrect** - See description above.

**Reference(s) provided to the student:**

None

**K/A: 241000A1.24 Reactor/Turbine Pressure Regulator**

A1. Ability to predict and/or monitor changes in parameters associated with operating the REACTOR/TURBINE PRESSURE REGULATING SYSTEM controls including:  
(CFR: 41.5 / 45.5)

A1.24 Main turbine eccentricity ..... 2.6 2.7

**LESSON PLAN/OBJECTIVE:**

N30-MTA-LP-01701, "Main Turbine" EO 017.015.A.01

**Reference(s) used to develop this question:**

N30-MTA-LP-01701, "Main Turbine"  
34SO-N30-001-2, "Main Turbine Operation"

**ON 6/26/09 BRUNO SUGGESTED maybe a question with the following: (1st part) warming the turbine & give 2 HMI screens and ask which screen used to monitor eccentricity. (2nd part) any turbine question, "where is pressure set set at (value)**

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26. 259002A4.03 001/2/1/FW LEVEL CONTROL/BANK/FUND/HT2009-302/RO/FNF/CME

**Unit 1** is at 60% power with the following conditions:

- o "A" RFPT is in Auto, controlled from the FW Master Controller 1C32-R600
- o "B" RFPT is in Manual, controlled from M/A station 1C32-R601B

Which one of the choices below completes the following two statements?

IAW 34SO-N21-007-1 "Condensate & Feedwater System", prior to placing the "B" RFPT in "Auto", its OUTPUT signal is to be matched with the INPUT signal using the \_\_\_\_\_.

When the "B" RFPT is in "Auto", the \_\_\_\_\_ will be used to balance flows between the RFPTs.

- A. output lever  
output lever
- B.  output lever  
set point keys
- C. set point keys  
output lever
- D. set point keys  
set point keys

---

**Description:**

The output lever is used in MANUAL to control the speed/flow of the RFPT but has no function in AUTO. The setpoint key can adjust speed/flow in AUTO but has no function when in MANUAL.

- A. **Incorrect**
- B. **Correct**
- C. **Incorrect**
- D. **Incorrect**

**Reference(s) provided to the student:**

None

**K/A: 259002A4.03 Reactor Water Level Control**

A4. Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)

A4.03 All individual component controllers when transferring from manual to automatic modes .  
3.8 3.6

**LESSON PLAN/OBJECTIVE:**

C32-RWLC-LP-00202, LT-19, LO-3

**Reference(s) used to develop this question:**

34SO-N21-007-1

C32-RWLC-LP-00202

27. 259002K6.04 001/2/1/FW LEVEL CONTROL/BANK/FUND/HT2009-302/RO/FNF/CME

**Unit 2** is operating at 100% rated power with the following conditions:

- o Feedwater Level Control is in three element automatic control
- o Reactor level is 36"
- o the "A" Feedwater Flow signal to the Feedwater Control System fails low

Which one of the choices below completes the following statement?

When the system stabilizes, reactor water level will be \_\_\_\_\_ and the Master Feedwater Level Controller will be in \_\_\_\_\_.

- A. higher;  
single element control
- B. higher;  
3 element control
- C.  the same;  
single element control
- D. the same;  
3 element control

**Description:**

With a 700,000 lbm/hr difference in A and B FW flow signals, the system swaps to single element control using the current median level signal. With steady state conditions (as in the stem) this transfer would be bumpless (i.e. no change in level).

A. **Incorrect** - this would be correct if the flow slowly failed low (level would go higher) until the A and B signals differ by 700,000 lbm/hr at which time it will swap to single element.

B. **Incorrect** - this would be correct if the flow slowly failed low (level would go higher) but the difference between A and B signals never differed by > 700,000 lbm/hr.

C. **Correct**

D. **Incorrect** - this would be correct if the candidate assumes a median signal is generated for Feewater (as opposed to level) and the system uses that median signal.

**Reference(s) provided to the student:**

None

**K/A: 259002K6.04 Reactor Water Level Control**

K6. Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR WATER LEVEL CONTROL SYSTEM : (CFR: 41.7 / 45.7)

K6.04 Reactor feedwater flow input ..... 3.1 3.1

**LESSON PLAN/OBJECTIVE:**

C32-RWLC-LP-00202, LT 4a

**Reference(s) used to develop this question:**

C32-RWLC-LP-00202

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28. 261000K3.01 001/2/1/SBGT/NEW/HIGHER/HT2009-302/RO/FNF/CME

Both units are at 100% power when the following occurs on **Unit 1**:

- o A loss of all feedwater occurs
- o HPCI and RCIC auto start on low level
- o Reactor level is restored to normal
- o The Unit 2 Refuel floor to Rx bldg hatch is installed
- o All Unit 1 and Unit 2 NORMAL ventilation systems respond as designed

**Unit 1** SGBTs are running

**Unit 2** SGBTs remain in standby

Which one of the choices below completes the following statement?

**Unit 2** Rx Bldg DP \_\_\_\_\_ and/but the **Unit 2** SGBT systems \_\_\_\_\_ expected to automatically start.

- A. approaches 0";  
were NOT
- B.  approaches 0";  
were
- C. remains the same;  
were NOT
- D. remains the same;  
were

---

**Description:**

HCPI and RCIC auto start on a reactor level of -35". This -35" signal, from either unit, trips normal RX Bldg Vent (thus causing a loss of DP) and sends a start signal to the SGBT.

- A. **Incorrect** - would be selected if -35" signal only trips Rx Bldg Vent.
- B. **Correct**
- C. **Incorrect** - would be selected in the -35" signal just affects Unit 1
- D. **Incorrect** - would be selected if -35" signal only starts SGBT.

**Reference(s) provided to the student:**

None

**K/A: 261000K3.01 SGTS**

K3. Knowledge of the effect that a loss or malfunction of the STANDBY GAS TREATMENT SYSTEM will have on following: (CFR: 41.7 /45.6)

K3.01 Secondary containment and environment differential pressure . . . . . 3.3 3.6

**LESSON PLAN/OBJECTIVE:**

T46-SBGT-LP-03001, LT 9

T41-SC HVAC-01303, LT 8, LT 9

**Reference(s) used to develop this question:**

T46-SBGT-LP-03001

T41-SC HVAC-01303

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29. 261000K3.06 001/2/1/SBG/NEW/HIGHER/HT2009-302/RO/ARB/CME

**Unit 2** is in the process of a plant startup after a refueling outage.

Normal Primary Containment Nitrogen makeup is in progress with the following conditions:

- o SBGT 2A is in service
- o Drywell Oxygen concentration ..... 4.2%, going down slowly

A malfunction occurs on the Normal supply breaker for 600 V Bus 2C causing it to de-energize.

Which ONE of the choices below completes the following statement?

SBGT 2A \_\_\_\_\_ remain in service, and with NO operator action, Drywell O<sub>2</sub> concentration will \_\_\_\_\_ .

- A. will;  
continue towards 3.0 %
- B. will;  
remain at 4.2 %
- C✓ will NOT;  
remain at 4.2 %
- D. will NOT;  
continue towards 3.0 %

**Description:**

600 V 2C supplies power to 2A SBTG fan, RPS 2A & Instrument Bus 2A. Drywell vent valves will be de-energized and therefore fail closed. The loss of Instrument Bus 2A will cause the Normal Drywell nitrogen makeup valve to isolate preventing nitrogen from entering containment. This, along with, losing 2A SBTG and Drywell vent valves will cause Drywell oxygen concentrations to stop going down. O<sub>2</sub> concentration will remain approximately the same as it was prior to the 600 V 2D loss.

- A. **Incorrect** - See description above. Plausible if candidate believes only the 2A SBTG fan is powered from 600V 2D. If candidate does not remember that nitrogen makeup is isolated, then oxygen concentration would continue towards 3.0%.
- B. **Incorrect**- See description above. Plausible if candidate believes only the 2A SBTG fan is powered from 600V 2D. If candidate believes nitrogen makeup is isolated, then oxygen concentration will remain at 4.2%.
- C. **Correct** - See description above.
- D. **Incorrect** - See description above. Plausible if candidate believes 2A SBTG fan is powered from 600V 2C. If candidate does not remember that nitrogen makeup is isolated, then oxygen concentration would continue towards 3.0%.

**Reference(s) provided to the student:**

None

**K/A: 261000K3.06 SGTS**

K3. Knowledge of the effect that a loss or malfunction of the STANDBY GAS TREATMENT SYSTEM will have on following: (CFR: 41.7 /45.6)

K3.06 Primary containment oxygen content: Mark-I&II . . . . . 3.0 3.3

**LESSON PLAN/OBJECTIVE:**

T23-PC-LP-01301, LT-36, LT-27, LO-4

**Reference(s) used to develop this question:**

34SO-T48-002-2  
34SO-T46-001-2

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30. 262001G2.2.44 001/2/1/EDG DC/BANK/HIGHER/HT2009-302/RO/FNF/CME

**Unit 2** is operating at 50% RTP when a loss of a power supply results in the following alarms:

- o ARI OUT OF SERVICE (603-305)
- o 4160V BUS 2E or 600V BUS 2C DC OFF (652-115)
- o BATTERY VOLTS LOW OR FUSE TROUBLE, (652-119)

Which ONE of the choices below completes the following statement?

If a loss of power to "2E" 4160 VAC Emergency Bus were to occur, the "2A" Diesel Generator \_\_\_\_\_ power the emergency bus and/but the "2E" 4160 VAC Emergency Bus breakers \_\_\_\_\_ be opened from the control room.

- A. will;  
can
- B. will;  
can NOT
- C. will NOT;  
can
- D. will NOT;  
can NOT

---

**Description:**

Normally, on loss of power, the "2A" EDG output breaker will close in and power the emergency bus. The listed annunciators indicate a loss of 125V DC Cabinet 2D, 2R25-S004. This supplies control logic to the "2A" EDG. Additionally, it supplies emergency bus breaker control power. This prevents control room operation of those breakers.

- A. **Incorrect**
- B. **Incorrect**
- C. **Incorrect**
- D. **Correct**

**Reference(s) provided to the student:**

None

**K/A: 262001G2.2.44 AC Electrical Distribution**

2.2.44 Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.  
(CFR: 41.5 / 43.5 / 45.12) IMPORTANCE RO 4.2 SRO 4.4

**LESSON PLAN/OBJECTIVE:**

R42-ELECT-LP-02704, LT-13

**Reference(s) used to develop this question:**

34AB-R22-001-2

31. 262002A3.01 001/2/1/VITAL AC/MODIFIED/HIGHER/HT2009-302/RO/FNF/CME

**Unit 2** is at 100% power when the following occurs:

- o A Loss of Off-Site Power
- o "2C" EDG fails to start

Which ONE of the following completes both statements?

The Vital AC System is currently being powered from the Vital AC \_\_\_\_\_ .

After power is restored to the "2C" 600V Emergency Bus non-essential loads, annunciator "240V VITAL AC BATT VOLTS LOW" (651-133) alarm is received.

Following this alarm, the Vital AC System will be powered from the \_\_\_\_\_ source.

- A. batteries ONLY;  
normal
- B.  batteries ONLY;  
alternate
- C. batteries and battery charger;  
normal
- D. batteries and battery charger;  
alternate

**Description:**

The LOSP and failure of EDG 2C cause 600 VAC Bus 2D to be de-energized. This bus supplies the battery charger for Vital AC. Vital AC is powered by batteries for about 2 hours at which point voltage will drop to about 208 volts (the same setpoint for the annunciator). The 208 volts causes a transfer to alternate AC. The alternate AC is powered from 600 VAC Bus 2C, receiving power from Bus 2E which receives power from EDG 2A. Non-essential loads were restored for "2C" 600V bus, therefore, alternate power is available.

- A. **Incorrect** - this would be chosen if the operator believes that the restoration of 2C restores normal power.
- B. **Correct** - See description above.
- C. **Incorrect** - this would be chosen if the operator believes that Vital AC never lost power and the battery annunciator indicates a battery problem only and NOT a transfer signal.
- D. **Incorrect** - this would be chosen if the operator believes that Vital AC never lost power and the battery annunciator indicates a battery/charger problem that will cause a transfer.

**Reference(s) provided to the student:**

None

**K/A: 262002A3.01 UPS**

A3. Ability to monitor automatic operations of the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) including: (CFR: 41.7 / 45.7)

A3.01 Transfer from preferred to alternate source . . . . . 2.8 3.1

**LESSON PLAN/OBJECTIVE:**

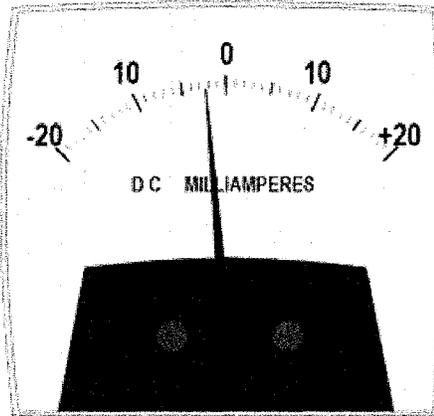
R25-ELECT-LP-02705, LT3, LT6

**Reference(s) used to develop this question:**

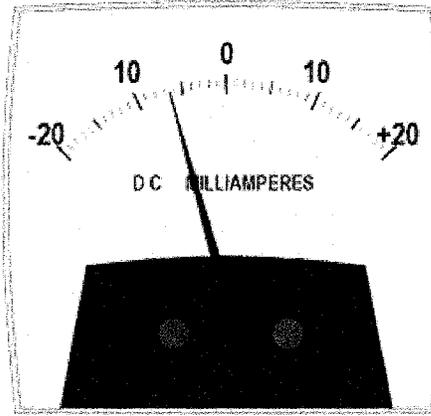
modified from Bruswick 2008 NRC Exam  
R25-ELECT-LP-02705  
34AR-651-103-2

**Unit 1** is operating at full power when the following occurs:

- o 125/250V BATTERY GND FAULT 651-141 alarms
- o 34AB-R42-001-0S, "Location Of Grounds" is entered
- o On 1H11-P655, the Battery Ground Detection System meter 1R42-R613B indicates the following when placed to Position 1 and then Position 2:



**Switch Position 1**



**Switch Position 2**

Which ONE of the choices below completes both of the following statements?

If the cause of the deflections is a single ground, then spurious component actuations due to the ground are \_\_\_\_\_ .

The readings from meter 1R42-R613B indicate that the ground \_\_\_\_\_ severe enough to continue executing procedure 34AB-R42-001-0S.

**REFERENCE PROVIDED**

- A. possible;  
is
- B. possible;  
is NOT
- C.  NOT possible;  
is
- D. NOT possible;  
is NOT

**Description:**

The DC system is ungrounded and, to get positive & negative flow through a component, would require at least two grounds. The ground is greater than -2 and -6, which per Attachment 2, means the ground is at least 18,000 ohms. The procedure is continued if the ground is LESS THAN 19,000 ohms (note: the lower the ohms the greater is the current flowing to ground).

The procedure, 34AB-R42-001-0S, determines servery of ground and NOT if the ground is single or multiple. As long as resistance is high (i.e. low current flow) a multiple ground situation won't cause component actuation.

Single grounds can not cause component operation since there must be a flowpath from positive to negative. At least two grounds (a positive and a negative) would be required to cause current flow.

The

- A. **Incorrect** - See description above.
- B. **Incorrect** - See description above.
- C. **Correct** - See description above.
- D. **Incorrect** - See description above.

**Reference Provided to candidate - 34AB-R42-001-0S, Page 2 (Section 4.0 Subsequent Operator Actions) and Attachment 2.**

**K/A: 263000A2.01 DC Electrical Distribution**

A2. Ability to (a) predict the impacts of the following on the D.C. ELECTRICAL DISTRIBUTION ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)

A2.01 Grounds ..... 2.8 3.2

**LESSON PLAN/OBJECTIVE:**

R42-ELECT-LP-02704, LT8, LT10

**Reference(s) used to develop this question:**

R42-ELECT-LP-02704  
34AB-R42-001-0S

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33. 264000K4.04 001/2/1/EDG/BANK/FUND/HT2009-302/RO/FNF/CME

**Unit 2** is at 100% power with the following conditions:

- o EDG 2A is to be run locally for post maintenance testing per 34SO-R43-001-2, "Diesel Generator Standby AC System".
- o the operator has pushed the local START pushbutton and reports:
  - EDG speed - 850 rpm
  - EDG voltage- 0 volts

Which one of the following actions must be performed to obtain voltage?

- A. Turn the "Voltage Adjust Switch" clockwise until 4160 volts is obtained
- B. Turn the "Speed Adjust Switch" clockwise until 900 rpm is obtained
- C. Place the "At Engine-Remote Switch" to "At Engine"
- D. Place the "At Engine-Remote Switch" to "Remote"

---

**Description:**

To locally start the EDG the control switch has to be placed in "At Engine". However, to flash the field it has to be momentarily placed in "Remote".

- A. **Incorrect** - Adjusting voltage will have no effect until the field is flashed but will work after it is flashed.
- B. **Incorrect** - to flash the field requires one of two EDG speeds (250 rpm or 810 rpm). At 850 rpm the EDG has met these permissives.
- C. **Incorrect** - The switch had to be "At Engine" for the operator to start the EDG and that is where the switch currently is (i.e. with 0 volts).
- D. **Correct** - See description above.

**Reference(s) provided to the student:**

None

**K/A: 264000K4.04 EDGs**

K4. Knowledge of EMERGENCY GENERATORS (DIESEL/JET) design feature(s) and/or interlocks which provide for the following: (CFR: 41.7)

K4.04 Field flashing ..... 2.6 2.7

**LESSON PLAN/OBJECTIVE:**

R43-EDG-LP-02801, LT18

**Reference(s) used to develop this question:**

R43-EDG-LP-02801

34SO-R43-001-2

34. 286000A4.05 001/2/2/FIRE/NEW/FUND/HT2009-302/RO/FNF/CME

**Unit 1** experiences a Loss of Offsite Power when the following occurs:

- o Annunciator "FIRE ALARM" (651-160) alarms
- o A Fire on "1E" Emergency Bus is reported
- o The Fire Brigade is dispatched
- o The Fire Brigade asks to de-energize "1E" Emergency Bus so water may be used on the fire

To de-energize the bus, the control room operator has to \_\_\_\_\_ .

In preparation for using water on the fire, the Control Room Operator should send an SO to manually start and monitor the \_\_\_\_\_ fire pump.

- A. trip EDG "1A"  
# 1 Diesel
- B. trip EDG "1A"  
Electric
- C.  open EDG "1A" output breaker  
# 1 Diesel
- D. open EDG "1A" output breaker  
Electric

**Description:**

The EDG can not be tripped from the control room with the Loss of Offsite Power. The output breaker must be opened and then the EDG can be tripped locally. The candidate may think the output breaker can't be tripped since it has an auto close feature with bus undervoltage.

The de-energization of "1E" Emergency Bus causes a loss of the Electric Fire Pump. This is the "normal" pump that starts first on low pressure. Without the electric pump, the next pump that starts and would be used, is the #1 diesel fire pump.

- A. **Incorrect** - See description above.
- B. **Incorrect** - See description above.
- C. **Correct** - See description above.
- D. **Incorrect** - See description above.

**Reference(s) provided to the student:**

None

**K/A: 286000A4.05 Fire Protection**

**(286000A4.02 REJECTED BY US / BRUNO REPLACED WITH 286000A4.05 ON 6/26/09)**

A4. Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)

A4.05 Fire pump . . . . . 3.3 3.3

**LESSON PLAN/OBJECTIVE:**

X43-FPS-LP-03601, LT LO-4

R43-EDG-LP-02801, LT-12

**Reference(s) used to develop this question:**

X43-FPS-LP-03601

R43-EDG-LP-02801

**Unit 1** is at 100% power with the following conditions:

- o Reactor Level Mode Select - Manual
- o Reactor Water Level Select - "B"
- o FW Control Mode Select - 3 Element
- o "B" GEMAC level transmitter starts slowly drifting upscale

Which ONE of the choices below completes the following statement?

The slowly drifting level transmitter causes the steam dryer/seperators to allow more \_\_\_\_\_ and the recirc/jet pumps will see a \_\_\_\_\_ in their available NPSH.

- A. carryover;  
increase
- B. carryover;  
decrease
- C. carryunder;  
increase
- D.  carryunder;  
decrease

---

**Description:**

The FWLC system controls carryover and carryunder. With level select in manual, the drifting "B" GEMAC signal will cause the FWLC system decrease actual level.

The actual decreasing level allows more carryunder (steam entrained in water) and thus increases the temperature and voiding of the downcomer water. The increased temperature/voiding decreases the NPSH for recirc and jet pumps.

- A. **Incorrect** - candidate selects this choice if he thinks FWLC will increase level.
- B. **Incorrect** - candidate selects this choice if he confuses carryunder with carryover.
- C. **Incorrect** - candidate selects this choice if he thinks FWLC will increase level and confuses carryunder with carryover.
- D. **Correct**

**Reference(s) provided to the student:**

None

**K/A: 290002K6.08 Reactor Vessel Internals**

K6. Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR VESSEL INTERNALS : (CFR: 41.7 / 45.7)

K6.08 Nuclear boiler instrumentation . . . . . 2.9 3.2

**LESSON PLAN/OBJECTIVE:**

C32-RWLC-LP-00202

**Reference(s) used to develop this question:**

C32-RWLC-LP-00202, LT LO1, EO5

36. 290003A1.04 001/2/2/MCREC/BANK/FUND/HT2009-302/RO/FNF/CME

Which ONE of the following **Unit 2** signals will cause Control Room pressure to automatically INCREASE relative to Turbine Building pressure?

- A. Refuel Floor Vent Exhaust radiation, 2D11-K611A-D 18 mr/hr
- B. High Drywell Pressure of 1.2 psig
- C. Main Steam Line Radiation HI-HI (3 times normal)
- D✓ Reactor Water Level of -110 inches

---

**Description:**

- A. **Incorrect** - Refuel Rad monitors of 15 mr/hr on K601A(M) cause MCREC to go into pressurization mode but NOT the K611 monitors.
- B. **Incorrect** - DW pressure of 1.85 psig cause pressurization mode but 1.2 psig causes the DW high pressure annunciator alarm.
- C. **Incorrect** - MSL radiation of 3x normal is a signal that requires MCREC to MANUALLY be placed into pressurization mode per 34AB-B21-001.
- D. **Correct** - a reactor level of -101" places MCREC into pressurization mode.

**Reference(s) provided to the student:**

None

**K/A: 290003A1.04 Control Room HVAC**

A1. Ability to predict and/or monitor changes in parameters associated with operating the CONTROL ROOM HVAC controls including: (CFR: 41.5 / 45.5)

A1.04 Control room pressure . . . . . 2.5 2.8

**LESSON PLAN/OBJECTIVE:**

Z41-MCREC-LP-03701, LT1, LT4, LT7

**Reference(s) used to develop this question:**

Z41-MCREC-LP-03701

**Unit 2** is operating at 50% power when the 2B Recirc pump trips resulting in the following plant conditions:

- o 2B31-R661A, "2A Recirc Percent Speed" ..... 32% speed.
- o Jet Pump Flow 2B21-R611A, "Total A Flow" ..... 21 Mlbm/hr.
- o Jet Pump Flow 2B21-R611B, "Total B Flow" ..... 6 Mlbm/hr.
- o 2B21-R613, "Core Plate dp / Rx Core Flow," core flow indication recorder ... 19 percent

Which ONE of the following identifies BOTH the accuracy of 2B21-R613 and actual Rx core flow in Mlbm/hr?

2B21-R613 \_\_\_\_\_ indicating accurate core flow AND total Rx core flow is \_\_\_\_\_ Mlbm/hr.

- A. Is;  
15
- B. Is;  
27
- C. Is NOT;  
15
- D.  Is NOT;  
27

**Description:**

34SO-B31-001-2;

5.1.5 During single loop operation, WHEN the speed of the running pump decreases below approximately 35% speed, positive flow through the idle pump loop due to natural circulation overcomes the negative flow due to reverse flow.

The total core flow summing circuitry will continue to subtract this positive idle loop flow from the running loop flow and give a misleading LOW core flow indication. Total core flow can be calculated by adding the JET PUMP LOOP "A" and the JET PUMP LOOP "B" flows. (convert to % core flow by dividing total core flow by 77 Mlbm/hr).

Since the 2A Recirc pump speed is <35%, the Total Jet pump loop flows must be added together ( $21 + 6 = 27$ ) and the flow recorder is inaccurate due to subtracting Total Jet pump loop flows ( $21 - 6 = 15$ ). There fore 15% is plausible, but incorrect.

The candidate will also have to convert percent core flow to Mlbm/hr to check the accuracy of the recorder. When converted 19% will equal approximately 15 Mlbm/hr which would indicate that the recorder is accurate if the candidate does not know or remember that the loop flows must be added, not subtracted.

A. **Incorrect** - see description above

B. **Incorrect** - see description above

C. **Incorrect** - see description above

D. **Correct** - below 35% speed the non operating pump's total jet pump flow should be added to the operating pump's total jet pump flow.

**Reference(s) provided to the student:**

None

**K/A: 295001K2.07 Partial or Complete Loss of Forced Core Flow Circulation**

AK2. Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION and the following: (CFR: 41.7 / 45.8)

AK2.07 Core flow indication..... 3.4 3.4

**LESSON PLAN/OBJECTIVE:**

B31-LP-RRS-00401 / EO 200.037.A.02

**Reference(s) used to develop this question:**

34SO-B31-001-2

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38. 295003K1.04 001/1/1/600 VAC/NEW/HIGHER/HT2009-302/RO/FNF/CME

**Unit 2** was at 20% power when the following occurred:

- o a manual reactor scram was inserted
- o MSIVs.....Closed
- o Reactor Pressure.....900 psig with HPCI
- o Reactor Level.....+30" with RCIC
- o Loss of Off-Site Power occurs
- o EDG "2A" fails to start
- o EDG "1B" is supplying "2F" 4160 VAC Bus
- o It is desired to power "2C" 600 VAC Bus from the "2CD" 600 VAC Transformer
- o NO EOPs have been entered

Which ONE of the choices below completes the following statement?

To power "2C" 600 VAC Bus from "2CD" 600 VAC Transformer, an electrical jumper \_\_\_\_\_ required to jumper out the breaker closure interlock and/but IAW 34AB-R23-001-2 "Loss Of 600 Volt Emergency Bus" the \_\_\_\_\_.

- A. is;  
interlock may be jumpered out
- B. is NOT;  
busses may NOT be connected
- C. is;  
interlock may NOT be jumpered out
- D. is NOT;  
busses may be connected.

**Description:**

Electrically there is an interlock that prevents supplying both 2C and 2D at the same time but, in the stem, only 2C will be powered. There is also an interlock which prevents normal and alternate from being closed in together but installing jumpers is not required (the normal breaker is opened from the control room).

Installing jumpers to transfer IS required for some busses such as in 34SO-R23-004-1 Hot Transfer Of 600V AC System.

Mechanical links normally installed from Bus 2F CD transformer to bus 2C (and 1C).

The plant is in Mode 3 because RCIC and HPCI are running (i.e. they are not isolated, there is steam, so the reactor is HOT) and the reactor is at 900 psig.

Busses may be cross connected ONLY in Modes 4 or 5, OR if in the EOPs. This is to insure compliance with Tech Spec 3.8.7, divisional separation. Procedurally, the requirement not to connect is contained as a limitation in 34SO-R23-001-2 and as part of a step in 34AB-R23-001-2.

- A. **Incorrect** - installing jumpers not necessary because it is not a HOT bus transfer.
- B. **Correct**
- C. **Incorrect** - - installing jumpers not necessary because it is not a HOT bus transfer
- D. **Incorrect** - the busses may NOT be connected in this mode (i.e. Mode 3).

**Reference(s) provided to the student:**

None

**K/A: 295003K1.04 Partial or Complete Loss of AC**

AK1. Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : (CFR: 41.8 to 41.10)

AK1.04 Electrical bus divisional separation..... 3.1 3.2

**LESSON PLAN/OBJECTIVE:**

R23-ELECT-LP-02703, LT5, LT9, LT13, LT EO 027.019.A

**Reference(s) used to develop this question:**

- 34SO-R23-001-2
- 34AB-R23-001-2.
- R23-ELECT-LP-02703

39. 295004G2.4.09 001/1/1/DC/NEW/HIGHER/HT2009-302/RO/FNF/CME

**Unit 1** is at 10% power when a seismic event causes the following:

- o 125/250 VDC Switchgear "1A" (1R22-S016) trips
- o A Main Steam Line leak in the drywell occurs
- o 10 minutes elapse and reactor parameters are:
  - Reactor level.....-108"
  - Reactor pressure.....600 psig

Which ONE of the following systems can be used for injection for the current plant conditions?

- A✓ HPCI
- B. RCIC
- C. RFPT
- D. CBP

**Description:**

- A. **Correct**
- B. **Incorrect** - RCIC loses power on loss of 1A DC.
- C. **Incorrect** - The MSIVs closed at a level of 101.5". Tech Spec closure is -113 inches.
- D. **Incorrect** - CBPs can not inject until pressure is ~ 500 psig.

**Reference(s) provided to the student:**

None

**K/A: 295004G2.4.09 Partial or Total Loss of DC Pwr**

2.4.9 Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies. (CFR: 41.10 / 43.5 / 45.13)  
IMPORTANCE RO 3.8 SRO 4.2

**LESSON PLAN/OBJECTIVE:**

B21-SLLS-LP-01401, LT LO-1  
R42-ELECT-LP-02704, LT-5  
C71-RPS-LP-01001, LT-16b

**Reference(s) used to develop this question:**

B21-SLLS-LP-01401  
R42-ELECT-LP-02704  
C71-RPS-LP-01001

40. 295005K3.07 001/1/1/MAIN TURBINE/BANK/FUND/HT2009-302/RO/FNF/CME

Which one of the following identifies the reason that the Turbine Bypass Valves open following a main turbine trip from full power?

- A. Prevent overspeeding of the main turbine during the coastdown
- B. Prevent over pressurization of the MSR cross-over piping.
- C.  Prevent over pressurization of the reactor vessel.
- D. Prevent rupture of the LP Turbine rupture discs.

**Description:**

Bypass valves open to prevent overpressurization of the reactor when the turbine control valves close on a turbine trip signal.

CHOICE "A" The intermediate stop valves close on a turbine trip to prevent overspeeding the main turbine. Extraction steam will be lost following a turbine trip and bypass steam is directed to the main condenser.

CHOICE "B" over pressurization is a function of the cross over relief valves.

CHOICE "C" correct answer

CHOICE "D" No problem with the condenser (vacuum) which would cause pressurization of the LP turbine.

**Reference(s) provided to the student:**

None

**K/A: 295005K3.07 Main Turbine Generator Trip**

AK3. Knowledge of the reasons for the following responses as they apply to MAIN TURBINE GENERATOR TRIP: (CFR: 41.5 / 45.6)

AK3.07 Bypass valve operation . . . . . 3.8 3.8

**LESSON PLAN/OBJECTIVE:**

N30-MTA-LP-01701, LO 1,2,3&4 (p.45 of 102)

**Reference(s) used to develop this question:**

**Brunswick 2008 NRC exam, question 40.**

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41. 295006A1.02 001/1/1/FWLC/MODIFIED/HIGHER/HT2009-302/RO/FNF/CME

**Unit 2** is at 100% power when the following occurs:

- o Main Turbine trips
- o Bypass Valves open
- o Reactor scrams
- o Steam Flow..... 2 mlbm/hr
- o Reactor Water Level..... -1" and starting to increase

Which ONE of the choices below completes the following statement?

As level is recovered, the LOWEST level at which a setpoint setdown will have occurred is \_\_\_\_\_ as determined by the \_\_\_\_\_

- A.  +3"  
Narrow Range Instruments, 2C32-R606 A/B/C
- B.  +3"  
Wide Range Instruments, 2B21-R604 A/B
- C.  +1"  
Wide Range Instruments, 2B21-R604 A/B
- D.  +1"  
Narrow Range Instruments, 2C32-R606 A/B/C

**Description:**

For a setdown to occur:

1. Reactor level must decrease to <20" AND,
2. Level must increase by 2" AND
3. Steam flow must be less than 60% of the last 6 minute average (100% steam flow is approximately 12.2 mlbm/hr)

The operator "knows" it is the median signal, increasing by 2" which gives a setpoint setdown. However, he must analyze these points: the median signal comes from the narrow range, the bottom of scale is 0", although at +1" level has increased by 2" yet Narrow Range has only "seen" 1 inch of this level increase. Therefore, Narrow Range will not perform setpoint setdown until +2" (+3" given as a choice).

- A. **Incorrect**
- B. **Correct**
- C. **Incorrect**
- D. **Incorrect**

**Reference(s) provided to the student:**

None

**K/A: 295006A1.02 SCRAM**

AA1. Ability to operate and/or monitor the following as they apply to SCRAM :  
(CFR: 41.7 / 45.6)

AA1.02 Reactor water level control system . . . . . 3.9 3.8

**LESSON PLAN/OBJECTIVE:**

C32-RWLC-LP-00202, LT18

**Reference(s) used to develop this question:**

C32-RWLC-LP-00202

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42. 295010A1.05 001/1/2/PRIMARY CONT/BANK/HIGHER/HT2009-302/RO/FNF/CME

**Unit 2** is operating at 23% power when a leak develops in the Drywell. The following conditions exist at Time 13:00:

- o Drywell pressure is 1.1 psig and increasing @ 0.1 psi/minute
- o Drywell venting is underway per 34SO-T48-002-2" Containment Atmospheric Control And Dilution Systems" per sections:
  - 7.1.3 "Primary Containment Venting" with drywell vent valves 2T48-F334A and 2T48-F335A OPEN
  - 7.3.3 "Fast Drywell Vent" with drywell vent valves 2T48-F320 and 2T48-F319 OPEN

Which ONE of the choices below completes the following statement?

The EARLIEST time that Primary Containment venting will be isolated is \_\_\_\_\_ .

- A. 13:00
- B. 13:02
- C. 13:07
- D. 13:09

**UPDATE  
DONE - ARB**

**Description:**

The DW high pressure alarm comes in at 0.65 psig so the group 2 isolation is not activated. At 1.2 psig the "Drywell Press High" alarm comes in. All venting is automatically secured if a group 2 isolation comes in (1.85 psig or +3"). At 13:00 going up 0.1 psig/min it will take approximately 8 minutes to exceed 1.85 psig.

- A. **Incorrect** - See description above.
- B. **Incorrect** - See description above.
- C. **Incorrect** - See description above.
- D. **Correct** - At 13:00 DW press is 1.1 psig going up 0.1 psig/min it will take approximately 8 minutes to exceed 1.85 psig.

**Reference(s) provided to the student:**

None

**K/A: 295010A1.05 High Drywell Pressure**

AA1. Ability to operate and/or monitor the following as they apply to HIGH DRYWELL PRESSURE : (CFR: 41.7 / 45.6)

AA1.05 Drywell/suppression vent and purge . . . . . 3.1 3.4

**LESSON PLAN/OBJECTIVE:**

T23-PC-LP-01301, LT-27

**Reference(s) used to develop this question:**

- 34AR-603-115-2
- 34AR-602-406-2
- 34AR-602-418-2
- 34SO-T48-002-2
- T23-PC-LP-01301

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43. 295013G2.4.01 001/1/2/PRIMARY CONT/MODIFIED/FUND/HT2009-302/RO/FNF/CME

**Unit 1** is operating at 75% with the following conditions:

- o Safety Relief Valve (SRV) "G" leaking past its seat
- o Suppression Pool temperature 102°F and increasing slowly
- o Drywell pressure 1.2 psig and increasing slowly

Which ONE of the following actions would the crew be expected to take?

Immediate entry into the EOP \_\_\_\_\_ is required and the requirement to place the Rx Mode Switch to Shutdown occurs/occurred at a MAXIMUM torus temperature of \_\_\_\_\_.

- A. PC flowchart (ONLY)  
100°F
- B.  PC flowchart (ONLY)  
110°F
- C. PC and RC (non-ATWS) flowcharts  
100°F
- D. PC and RC (non-ATWS) flowcharts  
110°F

**Description:**

Entry into PC is required at 100 deg F. Entry into RC is required at 1.85 psig or if scram is required and > 5% power.

At 110 deg F a scram/mode switch to shutdown would be done because the BIIT curve would be reached (EOP PC leg SP/T) and because of Tech Spec 3.6.2.1 required action

A. **Incorrect** - this would be selected if the 100 deg Tech Spec/EOP entry is confused with the 110 deg Tech Spec/Bitt curve.

B. **Correct**

C. **Incorrect** - this would be selected if 1.2 psig (the setpoint for annunciator DRYWELL/TORUS PRESS HIGH: 602-220) is confused with EOP entry of 1.85 psig AND 100 deg Tech Spec/EOP entry is confused with the 110 deg Tech Spec/Bitt curve.

D. **Incorrect** - this would be selected if 1.2 psig (the setpoint for annunciator DRYWELL/TORUS PRESS HIGH: 602-220) is confused with EOP entry of 1.85 psig

**Reference(s) provided to the student:**

None

**K/A: 295013G2.4.01 High Suppression Pool Temp.**

2.4.1 Knowledge of EOP entry conditions and immediate action steps.  
(CFR: 41.10 / 43.5 / 45.13)  
IMPORTANCE RO 4.6 SRO 4.8

**LESSON PLAN/OBJECTIVE:**

T23-PC-LP-01301, LT-48  
EOP-PC-LP-20310, LT-1, LT-31

**Reference(s) used to develop this question:**

T23-PC-LP-01301  
EOP-PC-LP-20310

44. 295015A1.02 001/1/2/RPS ATWS/BANK/FUND/HT2009-302/RO/FNF/CME

**Unit 2** was at 100% power when the following occurred:

- o An automatic scram signal is received
- o Control rods fail to insert
- o A manual scram is inserted
- o Reactor power is 7%
- o The 8 white RPS scram group lights, on 2H11-P603, are ILLUMINATED.

Which ONE of the choices below completes the following statement?

The lights indicate that the RPS scram solenoids are \_\_\_\_\_ and IAW 31EO-EOP-103-2 "EOP Control Rod Insertion Methods", the next action the operator should take is to \_\_\_\_\_.

- A. energized;  
individually scram in control rods
- B.  energized;  
take the RPS Test Trip Logic switches to TRIP
- C. de-energized;  
individually scram in control rods
- D. de-energized;  
take the RPS Test Trip Logic switches to TRIP

**Description:**

The scram solenoids are energized if the scram lights are illuminated. If they are illuminated, then the next step is to de-energize the scram solenoids by placing the test switches to TRIP.

Individually scrambling rods is a step that might be done if the scram group lights are NOT illuminated.

- A. **Incorrect**
- B. **Correct**
- C. **Incorrect**
- D. **Incorrect**

**Reference(s) provided to the student:**

None

**K/A: 295015A1.02 Incomplete SCRAM**

AA1. Ability to operate and/or monitor the following as they apply to INCOMPLETE SCRAM :  
(CFR: 41.7 / 45.6)

AA1.02 RPS..... 4.0 4.2\*

**LESSON PLAN/OBJECTIVE:**

EOP-103-LP-20314. LT-22  
C71-RPS-LP-01001, LT-11, LT LO-1

**Reference(s) used to develop this question:**

31EO-EOP-103-2  
EOP-103-LP-20314  
C71-RPS-LP-01001

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45. 295016A2.06 001/1/1/REMOTE SD/MODIFIED/HIGHER/HT2009-302/RO/FNF/CME

**Unit 2** is at 100% power when the following occurs:

- o A fire starts in the Control Room
- o SRV "B" opens and remains partially open
- o The following procedures are entered and ALL Immediate Operator actions are COMPLETE:
  - 31RS-OPS-001-2, "Shutdown from Outside the Control Room"
  - 34AB-C71-001-2, "Scram Procedure"
  - 34AB-X43-001-2, "Fire Procedure"

IAW 31RS-OPS-001-2, which ONE of the following conditions would REQUIRE closing the MSIVs?

- A. Reactor water level decreases from +30" to -30" over 30 minutes
- B.  Reactor pressure decreases from 1000 psig to 350 psig over 30 minutes
- C. Turbine Building steam line area temperatures at 175°F decreasing at 1°F/minute
- D. Main Steam line pressure 850 psig, decreasing 10 psig/minute

UPDATE

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**Description:**

Per 31RS-OPS-001-2, the MSIVs are to be closed if:

1. Level < -101 OR
  2. uncontrolled cooldown > 100 deg F/hr
  3. Indication of MSL break
  4. Any Group I isolation signal
- A. **Incorrect** - +3" is the level, if FW is inadequate, at which RCIC is started up and level is maintained +3" to +50". Plausible if candidate believes the MSIVs are the path for level decreasing and isolates MSIVs.
- B. **Correct** - There is a stuck open SRV and the reactor has cooled down greater than 100 deg/F in 30 minutes.
- C. **Incorrect** - A Group I isolation occurs if Turbine Building steam line area temperatures exceed 196°F. Plausible if candidate does not remember Group I setpoint and believes it has been exceeded.
- D. **Incorrect** - A Group I isolation occurs if MSL pressure is < 855 psig in RUN. However, immediate actions of 34AB-C71-001-2 are complete, which includes the mode switch being placed to SHUTDOWN. Plausible if candidate does not remember these actions.

**UPDATE  
DONE - ARB**

**Reference(s) provided to the student:**

None

**K/A: 295016A2.06 Control Room Abandonment**

AA2. Ability to determine and/or interpret the following as they apply to CONTROL ROOM ABANDONMENT : (CFR: 41.10 / 43.5 / 45.13)

AA2.06 Cooldown rate ..... 3.3 3.5

**LESSON PLAN/OBJECTIVE:**

C82-RSDP-LP-05201, LT LO-4

**Reference(s) used to develop this question:**

C82-RSDP-LP-05201  
31RS-OPS-001-2  
34AB-C71-001-2  
34AB-X43-001-2

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46. 295018K3.06 001/1/1/RBCCW/BANK/FUND/HT2009-302/RO/FNF/CME

**Unit 1** is operating at 5% power and the following conditions exist:

- o Reactor Water Cleanup (RWCU) is being used for reactor water level control
- o Reactor Building Closed Cooling Water (RBCCW) System heat exchangers have experienced fouling
- o RBCCW Heat Exchanger outlet temperature has risen to 95°F
- o The Shift Supervisor directs PSW flow through the heat exchanger (Hx) to be increased

Which ONE of the choices below completes the following two statements?

The PSW flow through the RBCCW Hx is increased to prevent the isolation of \_\_\_\_\_ .

When PSW flow is adjusted, PSW to RBCCW DP is expected to \_\_\_\_\_ .

- A. 1G31-F001, RWCU Inboard isolation valve;  
increase
- B. 1G31-F001, RWCU Inboard isolation valve;  
decrease
- C. 1G31-F004, RWCU Outboard isolation valve;  
increase
- D. 1G31-F004, RWCU Outboard isolation valve;  
decrease**

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**Description:**

Increased PSW flow will cause temperatures to decrease which will prevent the 140 deg F. RWCU Non-Regen heat exchanger isolation. This isolation only closes the F004 valve.

The increased flow through the heat exchanger is done by throttling open the PSW outlet valve. This will drop pressure and cause a decrease in DP.

- A. **Incorrect** - selected if candidate confuses which valve (F001 or F004) goes closed.
- B. **Incorrect** - selected if candidate confuses which valve (F001 or F004) goes closed.
- C. **Incorrect** - selected if candidate thinks the PSW Ht Exchanger inlet valve is opened up which would increase DP.
- D. **Correct** -

**Reference(s) provided to the student:**

None

**K/A: 295018K3.06 Partial or Total Loss of CCW**

AK3. Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER :

(CFR: 41.5 / 45.6)

AK3.06 Increasing cooling water flow to heat exchangers..... 3.3 3.3

**LESSON PLAN/OBJECTIVE:**

P42-RBCCW-LP-00901, LT-2

**Reference(s) used to develop this question:**

P42-RBCCW-LP-00901

47. 295019A2.02 001/1/1/AIR SBTG/NEW/HIGHER/HT2009-302/RO/ARB/CME

**Unit 2** is operating at 100% power when a total loss of Instrument Air occurs.

With no operator actions, which ONE of the following identifies how the Reactor Building differential pressure (dp) and the SBTG Filter Inlet dampers from the Reactor Building will be effected by the loss of Instrument Air?

Reactor Building dp will \_\_\_\_\_ and the SBTG Filter Inlet dampers from the Reactor Building will be \_\_\_\_\_ .

- A. remains as is;  
open
- B. remains as is;  
closed
- C.  approach 0";  
open
- D. approach 0";  
closed

**Description:** On a loss of Instrument Air the Reactor Building (RB) Supply & Exhaust Fans dampers fail closed, preventing normal flow through the system. This causes the RB differential pressure (dp) to approach a positive value. The SGBT Filter Inlet dampers from the Reactor Building will fail open on the loss of Instrument Air. Normal RB dp is -0.25 inches water.

**A. Incorrect**

The RB dp will not remain as is since the RB Exhaust/Supply dampers fail closed. **Plausible** if the candidate thinks the dampers do not change position.

**B. Incorrect**

The RB dp will not remain as is since the RB Exhaust/Supply dampers fail closed. **Plausible** if the candidate thinks the dampers do not change position.

**C. Correct;** see description above.

**D. Incorrect**

The RB dp will approach a positive value. **Plausible** if the candidate thinks the dampers do not change position.

**Reference(s) provided to the student:**

None

**K/A: 295019A2.02 Partial or Total Loss of Inst. Air**

AA2. Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR : (CFR: 41.10 / 43.5 / 45.13)

AA2.02 Status of safety-related instrument air system loads  
(see AK2.1 - AK2.19 Below)..... 3.6 3.7

AK2.12 Standby gas treatment..... 3.3 3.4

**LESSON PLAN/OBJECTIVE:**

P51-P52-P70-Plant Air-LP-03501, "Plant Air lesson Plan" EO 200.025.a.05

**Reference(s) used to develop this question:**

34AB-P51-001-2, "Loss of Instrument and Service Air System or Water Intrusion Into The Service Air System"

**Unit 2** is at 60% power when Outboard MSIV 1B21-F028A inadvertently fails closed.

Which ONE of the choices below completes the following statement?

Initially it is expected that reactor power will \_\_\_\_\_ and that an RPS half or full scram signal \_\_\_\_\_ be generated.

- A. increase;  
will
- B.  increase;  
will NOT
- C. remain the same;  
will
- D. remain the same;  
will NOT

---

**Description:**

The closing valve causes a Rx pressure increase which, in turn, causes a power increase. EHC will compensate for the pressure increase and the reactor stabilizes.

There are 4 scram signals that could occur: 1-MSIV closure, 2-High Rx Power, 3-High Rx Pressure, 4-High MSL Flow Isolation causing an MSIV closure.

1. A single MSIV closure does not cause an RPS scram signal, it takes at least two.
2. Power increases from 60% to 65% which is not enough to cause a APRM/OPRM scram signal.
3. Pressure increases from 960 psig to 980 psig which is not enough to cause a high pressure scram.
4. Individual Steam line flow goes from ~ 1.7 mlbm/hr steam to 2.3 mlbm/hr. This not enough to cause the high steam flow isolation and subsequent scram.  
(Note: power, pressure and flows verified on Hatch Standalone Simulator).

- A. **Incorrect** -
- B. **Correct** -
- C. **Incorrect** -
- D. **Incorrect** -

**Reference(s) provided to the student:**

None

**K/A: 295020A2.03 Inadvertent Cont. Isolation**

AA2. Ability to determine and/or interpret the following as they apply to INADVERTENT CONTAINMENT ISOLATION : (CFR: 41.10 / 43.5 / 45.13)

AA2.03 Reactor power..... 3.7 3.7

**LESSON PLAN/OBJECTIVE:**

B21-SLLS-LP-01401, LT-5

**Reference(s) used to develop this question:**

34SV-B21-001-1

B21-SLLS-LP-01401

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49. 295021G2.2.40 001/1/1/SDC TECH SPEC/NEW/HIGHER/HT2009-302/RO/FNF/CME

**Unit 2** is in Hot Shutdown with the following conditons

- o Rx pressure ..... 134 psig
- o "2A" Rx Recirculation pump ..... Running
- o "2B" Rx Recirculation pump ..... Off

Which ONE of the choices below completes BOTH the following statement?

IAW Tech Spec 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling System - Hot Shutdown" the MINIMUM number of RHR Shutdown Cooling (SDC) subsystems required to be operable, without requiring entry into a Required Action Statement (RAS), is \_\_\_\_\_ .

Also, IAW with Tech Spec 3.4.7 and with current plant conditions, \_\_\_\_\_ RHR SDC subsystem MUST be in operation.

- A. one;  
one
- B. one;  
neither
- C. two;  
one
- D. two;  
neither

**Description: Copy of TS 3.4.7**

3.4.7 Residual Heat Removal (RHR) Shutdown Cooling System - Hot Shutdown LCO 3.4.7 Two RHR shutdown cooling subsystems shall be OPERABLE and, with no recirculation pump in operation, at least one RHR shutdown cooling subsystem shall be in operation.

APPLICABILITY: MODE 3 with reactor steam dome pressure less than the RHR low pressure permissive pressure.

Given plant conditions of <135 psig Rx pressure and 1 recirc pump operating, 2 subsystems are required, but neither are required to be in operation.

With no recirc pumps running one RHR SDC subsystem would be required to be in service.

In mode 5 only one RHR subsystem is required IAW TS 3.9.7

- A. **Incorrect** - see above.
- B. **Incorrect** - see above
- C. **Incorrect** - see above.
- D. **Correct** - see above

**Reference(s) provided to the student:**

None

**K/A: 295021G2.2.40 Loss of Shutdown Cooling**

2.2.40 Ability to apply Technical Specifications for a system.  
(CFR: 41.10 / 43.2 / 43.5 / 45.3)  
IMPORTANCE RO 3.4 SRO 4.7

**LESSON PLAN/OBJECTIVE:**

E11-RHR-LP-00701, LT-58

**Reference(s) used to develop this question:**

E11-RHR-LP-00701  
Tech Specs

An irradiated fuel bundle in the "FULL-UP" position on the **Unit 2** Refueling Bridge Main Grapple and is being moved from the Unit 1 to the Unit 2 Fuel Pool. An equipment malfunction prevents Bridge movement and the bundle CANNOT be lowered.

- o The Fuel Pool Transfer Canal seals deflate which causes Fuel Pool water level to decrease to its lowest possible level
- o Only the 2D21-K601A and 2D21-K601M Area Radiation Monitors (ARM) red TRIP lights illuminate and these two ARMs will not reset.

Which ONE of the following predicts the Fuel Pool level and how the Main Control Room Environmental Control (MCREC) system is affected.

Fuel Pool Water level will \_\_\_\_\_ the top of the Fuel Bundle and the MCREC system will \_\_\_\_\_ .

- A. remain above  
remain in Normal Mode
- B. remain above  
align to the Pressurization Mode
- C. go below  
remain in Normal Mode
- D. go below  
align to the Pressurization Mode

---

The lowering fuel pool level, by itself, would cause general area radiation levels to increase. In this case, the grappled bundle is uncovered which will produce high radiation levels (per LT-LP-10015). The ARM trip lights indicate that the ARMs have exceeded the setpoint (15 mr/hr) which causes MCREC to go into pressurization mode

**Reference(s) provided to the student:**

None

**K/A: 295023A1.04 Refueling Acc**

AA1. Ability to operate and/or monitor the following as they apply to REFUELING ACCIDENTS : (CFR: 41.7 / 45.6)

AA1.04 Radiation monitoring equipment..... 3.4 3.7

**LESSON PLAN/OBJECTIVE:**

LT-LP-10015, "Refueling Industry Events" LO LT-10015.001  
Z41-MCREC-LP-03701, "Control Room Environmental Control"

**Reference(s) used to develop this question:**

**2009-301 2009 NRC EXAM Q#50**

HLT 5 NRC EXAM 2009-302

51. 295024A2.02 001/1/1/PRIMARY CONT/NEW/HIGHER/HT2009-302/RO/FNF/CME

**Unit 2** was at 100% power when a LOCA occurred. Current plant conditions are:

- o Emergency Depressurization.....in progress
- o Reactor pressure.....60 psig
- o Reactor Level indications
  - Narrow Range.....downscale
  - Wide Range.....-50", steady
  - Fuel Zone.....-60", erratic
  - Floodup.....downscale
- o Drywell pressure..... 5 psig
- o Drywell average temperature.....at RPV Saturation Temperature

Which ONE of the choices below completes the following statement?

Drywell sprays \_\_\_\_\_ be initiated and \_\_\_\_\_ can be used to determine level.

**REFERENCE PROVIDED**

- A. can;  
Wide Range Level Instruments
- B. can;  
NO Level Instruments
- C. can NOT;  
Wide Range Level Instruments
- D. can NOT;  
NO Level Instruments

**Description:**

Using Graph 1, the saturation temperature for a 60 psig reactor pressure is ~300 deg F. Using Graph 8, a 300 deg F. drywell temperature (with 5 psig in the drywell) is above the UNSAFE region for drywell spray.

At saturation conditions, reference legs may boil (as indicated by erratic behavior) however if boiling isn't occurring then they may be used. However, Wide Range can NOT be used if an Emergency Depressurization is in progress.

- A. **Incorrect**
- B. **Incorrect**
- C. **Inorrect**
- D. **Correct**

**Reference(s) provided to the student:**

**Unit 2 EOP Graph 1, "RPV Saturation Temperature" and Graph 8 "Drywell Spray Initiation Limit"**

**K/A: 295024A2.02 High Drywell Pressure**

EA2. Ability to determine and/or interpret the following as they apply to HIGH DRYWELL PRESSURE: (CFR: 41.10 / 43.5 / 45.13)

EA2.02 Drywell temperature..... 3.9 4.0

**LESSON PLAN/OBJECTIVE:**

EOP-CAU-LP-20305, LT-7  
EOP-CURVES-LP-20306, LT-12

**Reference(s) used to develop this question:**

Brunswick 2008 NRC Exam  
EOP-CAU-LP-20305  
EOP-CURVES-LP-20306

31EO-EOP-107-2, "ALTERNATE RPV PRESSURE CONTROL" is in progress.

- o The RCIC system is being used to control reactor pressure.
- o The 2E51-R612, "RCIC flow controller," is in automatic, with the setpoint at 300 gpm.

To DECREASE the reactor cooldown rate (CDR), the operator is required to use \_\_\_\_\_ and \_\_\_\_\_ IAW 31EO-EOP-107-2.

- A. 2E51-R612, "RCIC flow controller,"  
RAISE the setpoint
- B.  2E51-R612, "RCIC flow controller,"  
LOWER the setpoint
- C. 2E41-F011, "Test to CST VLV,"  
throttle it in the CLOSE direction
- D. 2E41-F011, "Test to CST VLV,"  
throttle it in the OPEN direction

**Description;** While RCIC is in pressure control mode with the controller in automatic, per procedure the cooldown rate (CDR) is controlled by adjusting controller and if necessary throttling 2E51-F022, "Test Line to CST" valve. 31EO-EOP-107-2 specifies that throttling F022 in the closed direction will increase the CDR if the controller is in auto. The 2E51-F022 and the 2E41-F011 valves are in series and are both required to be open for a pressure control flowpath. 2E41-F011 is not a throttle valve and 2E51-F022 is a throttle valve. The candidate must have knowledge of which valve throttles to operate RCIC in the pressure control mode.

This concept has been difficult for some students to master (which direction to throttle the valve or to adjust setpoint to decrease/increase CDR).

- A. **Incorrect**, 1st part is correct, 2nd is not correct, raising the setpoint will raise the CDR. **Plausible;** see description above.
- B. **Correct;** see description above.
- C. **Incorrect**, 1st part is not correct (wrong valve). 2nd part is not correct. **Plausible** if the student does not remember which valve is throttled to control CDR. Also if the candidate assumes that closing the valve results in less water flow, which would require less steam flow.
- D. **Incorrect**, 1st part is not correct (wrong valve). 2nd part is correct. **Plausible;** see description above.

**Reference(s) provided to the student:**

None

**K/A: 295025G2.1.23 High Reactor Pressure**

**2.1 Conduct of Operations**

**2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation. (CFR: 41.10 / 43.5 / 45.2 / 45.6) IMPORTANCE RO 4.3 / SRO 4.4**

**LESSON PLAN/OBJECTIVE:**

EOP-107-LP-20318, "Alter Press Control" EO 005.015.A.04

**Reference(s) used to develop this question:**

31EO-EOP-107-2, "Alternate RPV Pressure Control"

**Unit 1** is at 100% power when the following occurs:

- o SRV "C" has failed open
- o Shift Supervisor directs entry into EOP PC, "Primary Containment Control"
- o Torus temperature reaches 180°F
- o Shift Supervisor directs an emergency depressurization because torus temperature and reactor pressure can not be maintained less than the Heat Capacity Temperature Limit (HCTL).

Which ONE of the choices below completes the following statement?

The direction to emergency depressurize for HCTL concerns ensures the plant will NOT exceed \_\_\_\_\_.

- A. Primary Containment Pressure Limit (PCPL) while the rate of energy transfer to containment exceeds containment vent capacity.
- B. Net Positive Suction Head (NPSH) limits for low pressure ECCS when they are required for adequate core cooling.
- C. Boron Injection Initiation Temperature (BIIT) when Hot Shutdown Boron Weight has NOT been injected into the reactor.
- D. Suppression Chamber Spray Initiation Pressure (SCSIP) thus precluding chugging which could cause failure of the downcomer vents.

**Description:**

- A. **Correct**
- B. **Incorrect** - torus temperature affects NPSH but is not the bases for the depressurization.
- C. **Incorrect** - torus temperature affects BITT but is not the bases for the depressurization
- D. **Incorrect** - as in the correct choice, this distractor has to do with pressure but is the lowest Torus pressure that can occur where 95% of the non-condensibles are tranferred from the drywell to the torus. The limit is concerned with "chugging" and is not the bases for the depressurization.

**Reference(s) provided to the student:**

None

**K/A: 295026K3.01 Suppression Pool High Water Temp.**

EK3. Knowledge of the reasons for the following responses as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE:  
(CFR: 41.5 / 45.6)

EK3.01 Emergency/normal depressurization..... 3.8 4.1

**LESSON PLAN/OBJECTIVE:**

EOP-CURVES-LP-20306, LT-6

**Reference(s) used to develop this question:**

EOP-CURVES-LP-20306  
1999 Cooper NRC Exam  
1999 Duane Arnold NRC Exam

**Unit 2** is operating at 100% power with the 2B Drywell (DW) Chiller tagged out when a loss of the 2A DW Chiller occurs.

When repair of the 2A DW Chiller is complete, the following conditions exist:

- o Drywell Pressure: ..... 2.2 psig
- o Bulk Average Drywell Temperature: .... 275°F

Which ONE of the following completes the following statement?

IAW 31EO-EOP-100-2, "Miscellaneous Emergency Overrides", the "2A" DW Chiller \_\_\_\_\_.

- A. is NOT allowed to be restarted because at this DW temperature the potential for a rupture in the DW cooler OUTLET piping exists.
- B. is NOT allowed to be restarted because at this DW temperature the potential for a rupture in the DW cooler INLET piping exists.
- C✓ is allowed to be restarted. The operator must first place the LOCA override switch to "BYPASS" and then reset the 86 Lockout relay at the DW Chiller breaker.
- D. is allowed to be restarted. The operator must first reset the 86 Lockout relay at the DW Chiller breaker and then place the LOCA override switch to "BYPASS".

**Description:** 31EO-EOP-100-2 prohibits performing action to restart DW chillers and coolers when DW temp >250°F if the LOCA signal is due to a LOCA (i.e. can only do it if the loss of DW cooling is the reason DW temp is above 250°F). In this question temperature is above 250°F, but the actions may be performed because a real LOCA does not exist.

The sequence of component manipulation is critical to restart the chiller. The LOCA override/bypass must be performed first, or the lock out relay will not reset.

- A. **Incorrect;** see description above (LOCA override is allowed). **Plausible** since DW pressure is above 1.85 psig.
- B. **Incorrect;** see description above (temp is above 250°F). **Plausible** since the candidate must recall from memory the temperature limits for restarting the DW chillers during a LOCA.
- C. **Correct;** see description above. Temperature is above 250°F with no pipe break, the LOCA is bypassed, the lock out is reset.
- D. **Incorrect;** see description above (sequence is incorrect). **Plausible** because the actions taken are the correct actions; however, the sequence is reversed. Conditions allow the restart.

**Reference(s) provided to the student:**

None

**K/A: 295028A1.03 High Drywell Temperature**

EA1. Ability to operate and/or monitor the following as they apply to HIGH DRYWELL TEMPERATURE : (CFR: 41.7 / 45.6)

EA1.03 Drywell cooling system..... 3.9 3.9

**LESSON PLAN/OBJECTIVE:**

P64-PCCCW-LP-01304, "Primary Containment Cooling and Chilled Water System"  
EO 013.059.A.06

**Reference(s) used to develop this question:**

31EO-EOP-100-2, "Miscellaneous Emergency Overrides"

**Unit 2** is operating at 100% power when a Loss of Coolant Accident occurs. The High Pressure Coolant Injection (HPCI) system is being used to control RPV water level.

- o HPCI flow rate ..... 3,500 gpm
- o RWL ..... -80" and increasing at 1" per minute
- o RHR Loop "A" is in Suppression Pool Cooling
- o Torus level ..... 135 inches
- o Torus temperature ..... 210°F
- o Suppression Chamber Pressure ..... 6 psig

Which ONE of the following choices completes this statement?

HPCI pump operation is in the \_\_\_\_\_ region of the HPCI NPSH Limit graph and \_\_\_\_\_.

**REFERENCE PROVIDED**

- A. safe; flow must be maintained at or below its current flow rate
- B. safe; flow is required to be increased to restore RWL to the normal band
- C. unsafe; reducing flow will NOT restore operation to the safe area of the graph
- D. unsafe; reducing flow to 3,000 gpm will restore operation to the safe area of the graph

---

**Description:** The correct answer to this question is dependent on analyzing the correct graph. Graph selection is determined by whether suppression pool water level is At or Above 146 inches, or Below 146 inches. Common misconception among candidates on how to use the graphs, hard copy, due to having the safe region changing as torus pressure changes.

**A. Incorrect**

1st part is incorrect (is correct on >146" graph). **Plausible** if the candidate refers to Graph 17A.

2nd part is incorrect. Actually, flow must be reduced to restore safe operation. Plausible since RWL is increasing at a 1"/minute rate and there is no need to reduce HPCI flow. This option is dependent on the candidate referring to the wrong graph plotting operation in the safe area of the NPSH graph in the first place.

**B. Incorrect**

1st part is incorrect (is correct on >146" graph). **Plausible** if the candidate refers to Graph 17A.

2nd part is incorrect. Actually, flow must be reduced to restore safe operation. Plausible since the pump is capable of more flow and the candidate may assume this is allowed since RWL is out of the normal range of 32" to 42".

**C. Incorrect**

1st part is correct. This is only determined by analyzing EOP graph 17B

2nd part is incorrect. **Plausible** if the candidate interpolates and uses 6 psig (or uses the wrong line on the graph, below 5 psig limit), this will appear to be a correct option.

**D. Correct**

1st part is correct. This is only determined by analyzing EOP graph 17B, rather than 17A.

2nd part is correct. This is only determined by analyzing EOP graph 17B, rather than 17A

**Reference(s) provided to the student:**

Unit 2 EOP Graph 17A, HPCI Pump NPSH Limit, (Torus Water Level At or Above 146")

Unit 2 EOP Graph 17B, HPCI Pump NPSH Limit, (Torus Water Level Below 146")

**K/A: 295030K1.02 Low Suppression Pool Wtr Lvl**

EK1. Knowledge of the operational implications of the following concepts as they apply to LOW SUPPRESSION POOL WATER LEVEL: (CFR: 41.8 to 41.10)

EK1.02 Pump NPSH..... 3.5 3.8

**LESSON PLAN/OBJECTIVE:**

EOP-CURVES-LP-20306, "EOP Curves and Limits", EO 201.065.A.27

**Reference(s) used to develop this question:**

Unit 2 EOP Graph 17A, HPCI Pump NPSH Limit, (Torus Water Level At or Above 146")

Unit 2 EOP Graph 17B, HPCI Pump NPSH Limit, (Torus Water Level Below 146")

**Unit 1** is at 100% power when the following occurs:

- o All normal feedwater is lost
- o Reactor Scram
- o Rx Pressure..... 985 psig
- o Reactor Water Level..... -45" and slowly decreasing
  
- o RCIC indications:
  - o RCIC Speed..... 300 RPM
  - o RCIC Discharge pressure..... 50 psig
  - o RCIC Flow Indication..... 500 GPM (Upscale)
  - o RCIC Flow Controller..... Automatic
  - o RCIC Flow Controller Output.... 0 (Downscale)

Which ONE of the choices below completes the following statement?

RCIC flow controller should be \_\_\_\_\_ and/but \_\_\_\_\_.

- A. left in Automatic;  
RCIC injection flow will start increasing reactor vessel level
- B. left in Automatic;  
RCIC should be tripped because it is pumping 500 gpm through a feedwater line break
- C.  placed in Manual;  
the controller output should be increased until discharge pressure is greater than 985 psig
- D. placed in Manual;  
the controller output should be decreased until RCIC flow is 400 gpm.

---

**Description:**

A. **Incorrect** - this would be selected if the 500 gpm is determined to be valid injecting flow and RCIC has slowed the rate of level decrease.

B. **Incorrect** - this would be selected if the 500 gpm is determined to be valid flow indication and that, with just a loss of feedwater, level should be increasing.

C. **Correct** - RCIC rpms are lower than normal and the controller output is zero. This indicates a controller malfunction. RCIC won't be able to inject until its discharge pressure is greater than reactor pressure.

D. **Incorrect** - this would be selected if the 500 gpm flow is determined to be valid and the operator remembers that the flow controller is set at 400 gpm (so manual control is necessary to return flow to the setpoint).

**Reference(s) provided to the student:**

None

**K/A: 295031A1.05 Reactor Low Water Level**

EA1. Ability to operate and/or monitor the following as they apply to REACTOR LOW WATER LEVEL :  
(CFR: 41.7 / 45.6)

EA1.05 Reactor core isolation system: Plant-Specific..... 4.3\* 4.3\*

**LESSON PLAN/OBJECTIVE:**

E51-RCIC-LP-03901, EO-039.025.A, LT-39

**Reference(s) used to develop this question:**

E51-RCIC-LP-03901

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57. 295032K1.02 001/1/2/RB HVAC RAD/NEW/HIGHER/HT2009-302/RO/FNF/CME

**Unit 2** is at 100% power when the following occurs at **0100** hours:

- o HPCI Steam Line.....break occurs in the HPCI room
- o Unit 2 SBGTS.....auto start on high radiation
- o HPCI Pump Room Area Temp (2E31-N011).....85°F, rising 10°F/min

Which ONE of the choices below completes both of the following statements?

IAW 34SO-T46-001-2 “Standby Gas Treatment System”, the operator should \_\_\_\_\_ to limit the release of radioactive material.

The EARLIEST time the operator would expect BOTH HPCI room coolers to be running is at \_\_\_\_\_.

- A. place one SBTG in standby;  
0102
- B. place one SBTG in standby;  
0107
- C. allow both SBTGs to run;  
0102
- D. allow both SBTGs to run;  
0107

**Description:**

Procedure 34SO-T46-001-2 has a note which states that operation of both trains of SBGT will increase offsite release rates and has procedural steps to place in standby one of the operating trains.

The HPCI Room coolers start at 95 and 100 deg F so both will be running at time 0102.

The Steam Chase coolers start at 155 deg F and, if the candidate is thinking of this setpoint, will pick a time of 0107.

A. **Correct**

B. **Incorrect** - selected if the candidate is thinking that 155 deg F is the setpoint.

C. **Incorrect** - selected if candidate thinks two charcoal filter trains will remove more radioactive material (they will remove more from the building but, with two, the release rate doubles)

D. **Incorrect** - selected if candidate combines misconceptions of choices B and C.

**Reference(s) provided to the student:**

None

**K/A: 295032K1.02 High Secondary Containment Area Temperature**

EK1. Knowledge of the operational implications of the following concepts as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE:

(CFR: 41.8 to 41.10)

EK1.02 †Radiation releases..... 3.6 4.0

**LESSON PLAN/OBJECTIVE:**

T41-SC-HVAC-LP-01303, LT-13

T46-SBGT-LP-03001, LT-13

**Reference(s) used to develop this question:**

34SO-T46-001-2

T41-SC-HVAC-LP-01303

EOP SC

58. 295035K3.02 001/1/2/RB HVAC/NEW/FUND/HT2009-302/RO/FNF/CME

**Unit 1** is in a startup with the following conditions:

- o 1T41-C004A, Rx Bldg Vent Access Area Exh Fan.....Running
- o 1T41-C001A, Rx Bldg Vent Supply Fan.....Running
- o 1T41-C001B, Rx Bldg Vent Supply Fan.....Tagged Out

Which ONE of the choices below completes the following statement?

If T41-C001A, Rx Bldg Vent Supply Fan trips, the running Reactor Building Vent Access Area Exhaust Fan \_\_\_\_\_

- A. trips to prevent opening of the tornado vents
- B. trips because there are no running supply fans
- C.  remains running but should be tripped to prevent a high Reactor Building DP
- D. remains running and is required to run to insure monitoring of potential releases

**Description:**

Normally, on trip of a running supply fan, the standby fan auto starts and prevents excessive high DP. With the loss of both supply fans, the operator must take action to prevent the high DP (caution in section 7.2, System Shutdown)

- A. **Incorrect** - this would be selected if the operator confuses interlocks (i.e. the Supply Fan WILL trip if there is no Exhaust Fan is running) but thinks the reason is for tornado damper DP. However, the tornado dampers ONLY open if the building is pressurized. A running exhaust fan will keep the building at a negative pressure.
- B. **Incorrect** - this would be selected if the operator confuses interlocks (i.e. the Supply Fan WILL trip if there is no Exhaust Fan is running).
- C. **Incorrect** - first portion is correct but the second portion is incorrect since SBTG should be used to maintain DP and monitor releases.
- D. **Correct** - the exhaust fan is not interlocked with the supply fan and will continue to run. The exhaust fan should be shutdown per 34SO-T41-005, caution in section 7.2, System Shutdown.

**Reference(s) provided to the student:**

None

**K/A: 295035K3.02 Secondary Containment High Differential Pressure**

EK3. Knowledge of the reasons for the following responses  
as they apply to SECONDARY CONTAINMENT HIGH  
DIFFERENTIAL PRESSURE :  
(CFR: 41.5 / 45.6)

EK3.02 Secondary containment ventilation response..... 3.3 3.5

**LESSON PLAN/OBJECTIVE:**

T41-SC-HVAC-LP-01303, LT-9, TO-037.011.A

**Reference(s) used to develop this question:**

T41-SC-HVAC-LP-01303  
34SO-T41-005

**Unit 1** is at 70% power and increasing when Recirculation Pump A trips.

The following final, post transient, conditions exist:

Total Core Flow.....31.4 Mlbm/hr.  
APRMs.....48%  
OPRM System..... INOPERABLE  
Feedwater Temperature.....300°F

IAW 34AB-C51-001-1, "Reactor Operations With Inoperable OPRM System", the plant is in an \_\_\_\_\_ region and the crew should \_\_\_\_\_.

**REFERENCE PROVIDED**

- A. Analyzed;  
continue to monitor the plant
- B. Immediate Scram;  
insert a manual reactor scram
- C. Immediate Exit;  
Insert control rods to exit the region
- D. Immediate Exit;  
raise recirc flow to exit the region

**Description:**

With OPRMs inoperable, procedure 34AB-C51-001-1 "Reactor Operations With Inoperable OPRM System" needs to be entered. An immediate action is to scram if in the scram region of Attachment 1 or 2 (Power/Flow Maps). The correct power to flow map is the one with Final Feedwater Temperature being inoperable since it is more than 10 deg F. below the nominal temperature of ~325 deg. F.

A. **Incorrect** - this would be selected if the candidate reads 31.4 on the vertical scale (Thermal Power) and 48 on the horizontal scale (Core Flow)

B. **Correct**

C. **Incorrect** - this would be selected if the candidate uses the wrong power to flow map (Attachment 1) and remembers the procedural step to exit the region by use of control rods.

D. **Incorrect** - this would be selected if the candidate uses the wrong power to flow map (Attachment 1) and remembers the procedural step to exit the region by use of Recirc.

**Reference(s) provided to the student:**

34AB-C51-001-1 Attachments 1 and 2 and Page 1 Note (Concerning Use of 34GO-OPS-005-1)  
34GO-OPS-005-1, Attachment 2

**K/A: 295037K2.07 SCRAM Condition Present and Reactor Power Above APRM  
Downscale or Unknown**

EK2. Knowledge of the interrelations between SCRAM  
CONDITION PRESENT AND REACTOR POWER ABOVE APRM  
DOWNSCALE OR UNKNOWN and the following:  
(CFR: 41.7 / 45.8)

EK2.07 Neutron monitoring system..... 4.0\* 4.0

**LESSON PLAN/OBJECTIVE:**

LT-SG-50209, #2  
LT-RRS-LP-00401, LT-24, LT-33

**Reference(s) used to develop this question:**

Brunswick 2007 Draft NRC Exam  
34AB-C51-001-1  
34GO-OPS-005-1

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60. 295038K1.03 001/1/1/RELEASE/NEW/FUND/HT2009-302/RO/ARB/CME

A loss of the Vital AC bus currently exists on **Unit 2**.

Due to other plant conditions, a General emergency has been declared by the Emergency Director

The control room operator is performing a prompt offsite dose assessment in accordance with 73EP-EIP-005-0, On Shift Operations Personnel Emergency Duties and 73EP-EIP-018-0, Prompt Offsite Dose Assessment (PODA).

Which ONE of the following identifies the wind speed instrument to be used for an ELEVATED release and where to obtain the data AND the affect of wind speed changes on the final site boundary dose calculations?

In order to obtain release assessment information for an ELEVATED release, the operator will use the \_\_\_\_\_ .

A change in wind speed \_\_\_\_\_ affect the final site boundary dose calculation.

- A. 100 Meter Wind Speed value from Unit 2 SPDS panel will NOT
- B✓ 100 Meter Wind Speed value from 1H11-P690 panel will
- C. 10 Meter Wind Speed value from Unit 2 SPDS panel will NOT
- D. 10 Meter Wind Speed value from 1H11-P690 panel will

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Description;

100 meters is elevated; 10 meters is ground  
Power supply to Unit 2 SPDS is Vital AC 2R25-S063

- A. 1st part Incorrect because SPDS is unavailable. Plausible if applicant thinks that SPDS is still available. 2nd part is incorrect because changing wind speed will change the final site boundary dose calculation.
- B. Correct.
- C. Incorrect because 100 meters is elevated. Plausible if applicant thinks that SPDS is still available or the 10 meter instrument is the primary instead of secondary.
- D. Incorrect because 100 meters is elevated. Plausible if applicant realizes that SPDS is not available or the 10 meter instrument is the primary instead of secondary.

**Reference(s) provided to the student:**

None

**K/A: 295038K1.03 High Off-site Release Rate**

EK1. Knowledge of the operational implications of the following concepts as they apply to HIGH OFF-SITE RELEASE RATE : (CFR: 41.8 to 41.10)

EK1.03 †Meteorological effects on off-site release..... 2.8 3.8

The KA match was made because the "operational implication" is that the TRN-0052 meteorological form and 73EP-EIP-018-0 PODA will be used by the operator to determine whether a release is underway.

**LESSON PLAN/OBJECTIVE:**

LR-LP-20017, Offsite Dose Assessment lesson plan

**Reference(s) used to develop this question:**

TRN-0052, MIDAS Input Data Acquisition Form  
73EP-EIP-005-0, On-Shift Operations Personnel Emergency Duties  
73EP-EIP-018-0, Prompt Offsite Dose Assessment  
34AB-D11-001-1S, Radioactivity Release Control

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61. 300000K6.07 001/2/1/AIR/BANK/FUND/HT2009-302/RO/FNF/CME

**Unit 2** is at 100% power with the following conditions:

- o A Service Air Header break has occurred
- o The break is greater than the capacity of the Service Air Compressors

Which ONE of the choices below completes the following two statements?

As air pressure decreases, it is expected that 2P51-F017, Turbine Building Service Air Isolation Valve, will isolate at \_\_\_\_\_ .

If 2P51-F017 fails to isolate and pressure continues to decrease, it is expected that 2P52-F015, Non-Essential Inst. Air Isolation Valve, will isolate at \_\_\_\_\_ .

- A. 80 psig;  
61 psig
- B. 80 psig;  
50 psig
- C. 70 psig;  
61 psig
- D✓ 70 psig;  
50 psig

---

**Description:**

F017 setpoint - 70 psig

F015 setpoint - 50 psig

A. **Incorrect** - 80 psig is the pressure at which the Backup Nitrogen Supply to instrument air opens.

B. **Incorrect** - 80 psig is the pressure at which the Backup Nitrogen Supply to instrument air opens.

C. **Incorrect** - 61 psig is the pressure at which F015 reopens following an isolation.

D. **Correct** -

**Reference(s) provided to the student:**

None

**K/A: 300000K6.07 Instrument Air**

K6 Knowledge of the effect that a loss or malfunction of the following will have on the INSTRUMENT AIR SYSTEM:  
(CFR: 41.7 / 45.7)

K6.07 Valves ..... 2.5 2.6

**LESSON PLAN/OBJECTIVE:**

P51-P52-P70-Plant Air-LP-03501, LT-35

**Reference(s) used to develop this question:**

34AR-700-205-2

P51-P52-P70-Plant Air-LP-03501

62. 400000K2.02 001/2/1/RBCCW 600VAC/NEW/FUND/HT2009-302/RO/FNF/CME

Unit 1 is at 100% power when the following annunciators alarm:

- o 600V BUS 1D BREAKER TRIPPED, 652-318
- o 600V BUS 1D UNDERVOLTAGE, 652-323

Which ONE of the following lists two components that have lost power?

- A. Station Service Air Compressor A;  
RBCCW Drywell Inlet Isolation Valve (P42-F051)
- B. Station Service Air Compressor A;  
RWCU Inboard Suction Isolation Valve (G31-F001)
- C✓ Station Service Air Compressor B;  
RBCCW Drywell Inlet Isolation Valve (P42-F051)
- D. Station Service Air Compressor B;  
RWCU Inboard Suction Isolation Valve (G31-F001)

**Description:**

Station Air Compressor A is powered from Bus C  
Station Air Compressor B is powered from Bus D.  
RBCCW F051 valve is powered from MCC S012 which gets power from Bus D.  
RWCU F001 valve is powered from MCC S011 which gets power from Bus C, F004 is powered from 600 Bus D thru S012,.

- A. **Incorrect**
- B. **Incorrect**
- C. **Correct**
- D. **Incorrect**

**Reference(s) provided to the student:**

None

**K/A: 400000K2.02 Component Cooling Water**

K2. Knowledge of electrical power supplies to the following:  
(CFR: 41.7)

K2.02 CCW valves ..... 2.9 2.9

**LESSON PLAN/OBJECTIVE:**

**Reference(s) used to develop this question:**

P42-RBCCW-LP-00901  
R23-ELECT-LP-02703  
G31-RWCU-LP-00301

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63. 500000K2.06 001/1/2/EOP H2 PCG/NEW/HIGHER/HT2009-302/RO/FNF/CME

Unit 2 was at 100% power when a lowering reactor water level causes the following Primary Containment hydrogen/oxygen conditions:

TIME	OXYGEN %	HYDROGEN %
0100	4	3
0130	5	4
0200	6	5
0230	7	6

IAW 31EO-PCG-001-2, "Primary Containment Gas Control", which ONE of the following identifies the EARLIEST time that torus spray is required, irrespective of Adequate Core Cooling?

WHILE PERFORMING THE FOLLOWING				
IF drywell and torus gas concentrations are within a range specified in the table below		THEN perform the action specified in the table		
		HYDROGEN Drywell OR torus H2 (whichever is higher)		
		None detected (below 1.5%)	1.5% or higher AND less than 6%	6% or higher OR cannot be determined to be less than 6%
O X Y G E N	Drywell AND torus O2 less than 5%	no action required go to point Q on this sheet	perform path G-1 go to point R on this sheet	perform path G-1 go to point R on this sheet
	Drywell OR torus O2 5% or higher OR cannot be determined to be less than 5%	no action required go to point Q on this sheet	perform path G-2 go to point S on this sheet	perform path G-3 go to point T on this sheet

- A. 0100
- B. 0130
- C. 0200
- D. 0230

**Description:**

- A. **Incorrect** - These concentrations place H2/O2 control in path G-1 which doesn't spray the torus.
- B. **Incorrect** - These concentrations place H2/O2 control in path G-3 which doesn't spray the torus.
- C. **Incorrect** - These concentrations place H2/O2 control in path G-2 which doesn't spray the torus.
- D. **Correct** - These concentrations place H2/O2 control in path G-3 which DOES spray the torus.

**Reference(s) provided to the student:**

The top section 31EO-PCG-001-1, "Primary Containment Gas Control" with the "While Performing the Following" decision block.

**K/A: 500000K2.06 High CTMT Hydrogen Conc.**

EK2. Knowledge of the interrelations between HIGH CONTAINMENT HYDROGEN CONCENTRATIONS the following:  
(CFR: 41.7 / 45.8)

EK2.06 Wetwell Spray system ..... 3.0 3.4

**LESSON PLAN/OBJECTIVE:**

EOP-PC-LP-20310, LT-63

**Reference(s) used to develop this question:**

EOP-PC-LP-20310  
31EO-PCG-001-2 (EOP PCG)

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64. 600000K1.02 001/1/1/FIRE/NEW/FUND/HT2009-302/RO/FNF/CME

**Unit 2** is at 20% power when the following occurs:

- o A fire has been reported
- o The Fire Brigade Leader declares it a MAJOR fire

Which ONE of the choices below completes the following statement?

IAW 34AB-X43-001-2, "Fire Procedure", a fire in which \_\_\_\_\_ is involved, would REQUIRE a Reactor Scram.

- A. a Unit Auxillary Transformer
- B. a Turbine Building Cable Tray
- C✓ the Main Turbine Lube Oil system
- D. the River Intake Structure

---

**Description:**

Only oil fires require a reactor scram. The other distractors require a fast reactor shutdown.

- A. **Incorrect**
- B. **Incorrect**
- C. **Correct**
- D. **Incorrect**

**Reference(s) provided to the student:**

None

**K/A: 600000K1.02 Plant Fire On Site**

AK1 Knowledge of the operation applications of the following concepts as they apply to Plant Fire On Site:

AK1.02 Fire Fighting ..... 2.9 3.1

**LESSON PLAN/OBJECTIVE:**

LT-LP-20201, LO-17

**Reference(s) used to develop this question:**

34AB-X43-001-2

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65. 700000K2.07 001/1/1/GENERATOR VOLTAGE/NEW/HIGHER/HT2009-302/RO/FNF/CME

**Unit 2** is at 100% power with the following conditions:

- o Georgia Control Center (GCC) has notified Hatch of degraded grid conditions
- o The Main Generator Auto Voltage Regulator has failed
- o The GCC Load Dispatcher and Shift Supervisor agree to keep Hatch Unit 2 reactive load at (plus) +20 MVAR
- o Current reactive load is (minus) -20 MVAR

Which ONE of the choices below completes the following statement?

IAW 34SO-N40-001-2, Main Generator Operating Procedure, to achieve +20 MVARs, the Regulator Voltage Adjust Switch must be placed in the \_\_\_\_\_ position and the operator who maintains MVARs/voltage \_\_\_\_\_ be the OATC.

- A. "LOWER";  
can
- B. "LOWER";  
can NOT
- C. "RAISE";  
can
- D. "RAISE";  
can NOT

**Description:**

To change MVARs from minus to positive, voltage must be increased. IAW 34SO-N40-001, to raise voltage the switch is placed to the left. This switch is the same one for Auto or Manual operations. However, with the failure of the Auto Regulator, the system has auto swapped to the manual regulator. IAW 34SO-N40-001, if manual voltage control is being used, then the operator can have no other duties.

- A. **Incorrect**
- B. **Incorrect**
- C. **Incorrect**
- D. **Correct**

**Reference(s) provided to the student:**

None

**K/A: 700000K2.07 Generator Voltage and Electric Grid Disturbances**

AK2. Knowledge of the interrelations between GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES and the following: (CFR: 41.4, 41.5, 41.7, 41.10 / 45.8)

AK2.07 Turbine/generator control . . . . . 3.6 3.7

**LESSON PLAN/OBJECTIVE:**

N40-MG-LP-10002, LT-26, LT-27

**Reference(s) used to develop this question:**

N40-MG-LP-10002  
34SO-N40-001-2

66. G2.1.06 001/3//CONDUCTO OF OPS/NEW/FUND/HT2009-302/RO/ARB/CME

A transient has occurred on **Unit 1** requiring the crew to enter several abnormal procedures.

IAW DI-OPS-59-0896, "Operations Management Expectations", Shift Supervisors and the \_\_\_\_\_, are responsible for performing Crew Briefs and \_\_\_\_\_ are responsible for performing Crew Updates.

- A. Operator At The Controls;  
ALL crew members
- B. Operator At The Controls;  
ONLY Nuclear Plant Operators
- C✓ Shift Manager;  
ALL crew members
- D. Shift Manager;  
ONLY Nuclear Plant Operators

**Description:**

DI-OPS-59-0896, "Operations Management Expectations" states in Attachment 5 section 4.1 for Briefs and Updates that Briefs are a tool used by the Shift Supervisor (or Shift Manager in rare cases) to bring all crew members to the same level of knowledge regarding plant status.

Step 4.2.1 for "Updates" states anyone on the crew can share information that will benefit all other crewmembers.

- A. **Incorrect** - See description above.
- B. **Incorrect** - See description above.
- C. **Correct** - See description above.
- D. **Incorrect** - See description above.

**Reference(s) provided to the student:**

None

**K/A: 2.1. 06 Ability to manage the control room crew during plant transients.**

**LESSON PLAN/OBJECTIVE:**

**Reference(s) used to develop this question:**

DI-OPS-59-0896, "Operations Management Expectations"

**IDEAS FROM BRUNO, ANNUNCIATOR RESPONSE DIFFERENCES BETWEEN NORMAL & TRANSIENT CONDITIONS, OR BRIEFS CHOREOGRAPHY OR WHO CAN GIVE UPDATES/BRIEFS. MAKE SURE WHAT WE USE IS WRITTEN DOWN IN A DOCUMENT. 6/26/09**

67. G2.1.08 001/3//RWCU/NEW/FUND/HT2009-302/RO/FNF/CME

**Unit 2** is in a plant startup with the following conditions:

- o RWCU "A" pump in service
- o RWCU Filter Demineralizer (F/D) "A" is out of service
- o RWCU Filter Demineralizer (F/D) "B" is being placed in service by an SO

Which ONE of the choices below answers both of the following statements?

IAW 34SO-G31-003-2 "Reactor Water Cleanup System":

As the SO increases flow through the "B" F/D, the Control Room Operator should throttle closed 2G31-F044, Demin Bypass valve, with a final position of \_\_\_\_\_ when the "B" F/D is fully in service.

As F/D flow is increased, if annunciator "RWCU FILTER DEMIN FAILURE" (602-433) alarms, the cause can be determined by looking for additional alarms on panel \_\_\_\_\_ .

- A. partially closed;  
2H11-P602
- B.  partially closed;  
2G31-P001
- C. fully closed;  
2H11-P602
- D. fully closed;  
2G31-P001

**Description:**

Flow is increased in the Demin to 95-125 gpm (120 gpm desired) and the CR operator throttles flow with the F044 to maintain system flow at 200-260 gpm. If both demins are in service and seal purge is NOT in service, THEN F044 is fully closed and maintained closed.

Flow would be reduced in the demin if it was outside of the band or being removed from service. If the annunciator alarm comes in, even though the isolation doesn't come in for 45 seconds, both the 34SO and 34AR procedure requires F/D isolation.

- A. **Incorrect**
- B. **Correct**
- C. **Incorrect**
- D. **Incorrect**

**Reference(s) provided to the student:**

None

**K/A: 2.1. 08 Ability to coordinate personnel activities outside the control room.**

**LESSON PLAN/OBJECTIVE:**

G31-RWCU-LP-00301, LT-10, LT-11c

**Reference(s) used to develop this question:**

34SO-G31-003-2  
G31-RWCU-LP-00301

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68. G2.1.17 001/3//ADMIN/NEW/FUND/HT2009-302/RO/FNF/CME

**Unit 1** has experienced a transient. HPCI has failed to start and reactor water level (RWL) is decreasing.

IAW DI-OPS-59-0896, Operations Management Expectations, which ONE of the choices below completes BOTH the following statements?

The operator reporting the HPCI failure to the Shift Supervisor \_\_\_\_\_ required to call the Shift Supervisor's name or title.

When reporting RWL, the RWL trend \_\_\_\_\_ required to be reported.

- A.  is;  
is
- B.  is;  
is NOT
- C.  is NOT;  
is
- D.  is NOT;  
is NOT

**Description:**

IAW DI-OPS-59-0896, Attachment 2, name/position and rate/trend are required.

If the operator thought neither are required he would report something like "level is 32".

- A. **Correct -**
- B. **Incorrect**
- C. **Incorrect -**
- D. **Incorrect -**

**Reference(s) provided to the student:**

None

**K/A: 2.1. 17 Ability to make accurate, clear, and concise verbal reports.**

**LESSON PLAN/OBJECTIVE:**

LT-LP-20201, LO-17

HLT-SIM-LP-00003

**Reference(s) used to develop this question:**

DI-OPS-59-0896

69. G2.2.01 001/3//RWM STARTUP/NEW/FUND/HT2009-302/RO/FNF/CME

**Unit 1** is in cold shutdown with:

- o Mode Switch in SHUTDOWN
- o Pre-startup activities underway

Which ONE of the choices below completes the following statement?

IAW 34GO-OPS-001-1, "Plant Startup", in order to perform RWM Operability Check the refuel bridge is required to be \_\_\_\_\_ and the mode switch is required to be placed in \_\_\_\_\_.

- A. de-energized;  
REFUEL
- B. de-energized;  
START /HOT STBY
- C. energized;  
REFUEL
- D. energized;  
START /HOT STBY

**Description:**

The bridge needs to be energized to clear potential rod blocks and the mode switch placed in Startup for testing.

The candidate may select mode switch in Refuel since rod movement can occur there and all the pre-startup activities are to ALLOW the mode switch to be placed into startup (it is allowed for testing RWM, not for starting up).

The candidate may select the bridge deenergized since this would be normal for a running plant.

A. **Incorrect**

B. **Incorrect**

C. **Incorrect**

D. **Correct**

**Reference(s) provided to the student:**

None

**K/A: 2.2. 01**

**Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.**

**LESSON PLAN/OBJECTIVE:**

C11-RWM-LP-05403, LT-15  
SG50103, TO-8

**Reference(s) used to develop this question:**

34GO-OPS-001-1  
C11-RWM-LP-05403

During performance of 34SV-R43-001-2, "Diesel Generator 2A Monthly Surveillance", in preparation for barring over Diesel Generator 2A, the SO has just placed the local switch for Diesel Generator 2A to "AT ENG" and depressed the emergency stop pushbutton.

Which ONE of the following is the status of Diesel Generator 2A?

- A. Available and Operable
- B. Available but Degraded
- C.  Available but NOT Operable
- D. NEITHER Available NOR Operable

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**Description:**

A system, subsystem, division, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, division, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).

In this case Diesel Generator 2A is not capable of automatically starting if called upon due to local actions (at engine & trip p.b. depressed), therefore it is inoperable. The diesel is available, (if needed), due to the local manual actions of the operators.

- A. **Incorrect** See description above
- B. **Incorrect** See description above
- C. **Correct** See description above
- D. **Incorrect** See description above

**Reference(s) provided to the student:**

None

**K/A: 2.2.37 Ability to determine operability and/or availability of safety related equipment.**

**LESSON PLAN/OBJECTIVE:**

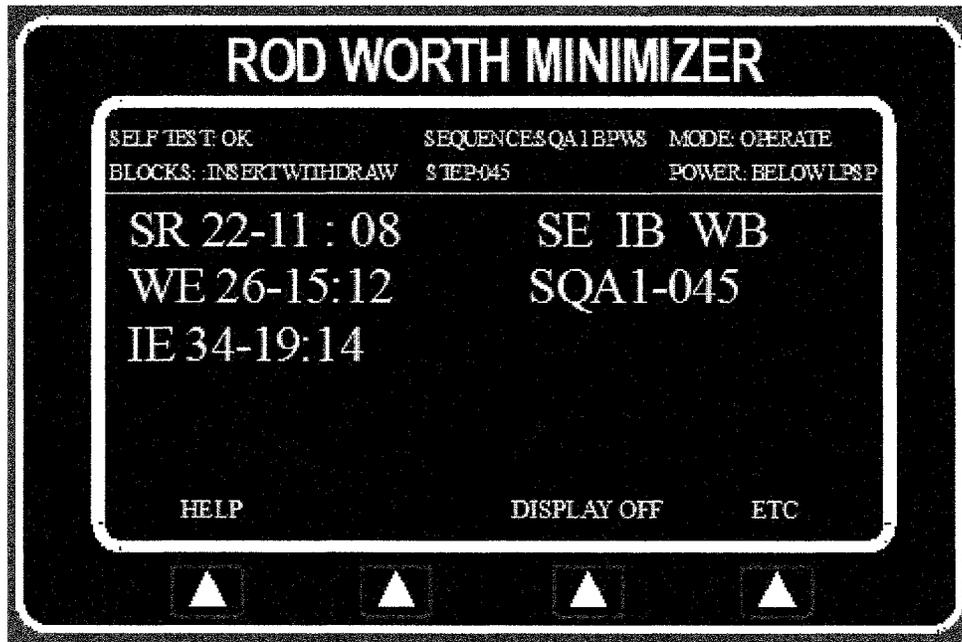
**Reference(s) used to develop this question:**

34SV-R43-001-2, "Diesel Generator 2A Monthly Surveillance" section 7.2.17

71. G2.2.44 001/3//EQUIP CONTROL/NEW/HIGHER/HT2009-302/RO/ARB/CME

Unit 1 was at 100% power when a scram condition occurred.

- o All control rods did NOT fully insert (distributed at various levels in the core)
- o 250 psid water d/p has been established (highest achievable)
- o The RWM display indicates as follows:



Which ONE of the following correctly states whether CRD drive water dp is adequate to manually insert control rods AND whether rod movement of the selected rod is possible using the "Emergency In Notch Override Switch" for the current plant conditions?

Drive water dp \_\_\_\_\_ adequate to manually insert control rods and/but RWM \_\_\_\_\_ allow control rod insertion using the "Emergency-In Notch Override Switch".

- A. is;  
will
- B. is;  
will NOT
- C. is NOT;  
will
- D. is NOT;  
will NOT

**Description:**

IAW 34SO-C11-005-1, "Control Rod Drive System", step 7.1 "System Startup And Normal Operation" states 220 - 280 psid is allowed dp range for driving control rods and 260 psid is normal dp.

Per 31EO-EOP-103-1, "Control Rod Insertion Methods" section 3.7, "Driving Rods" states RWM is placed to "Bypass" to drive control rods.

If below LPSP, RWM will be enforcing a control rod INSERT block, therefore the need to bypass RWM.

Plausible because the "Emergency In Notch Override Switch" will bypass the normal rod insertion sequence and will bypass any RMCS blocks and energize the insert bus directly. However, it does not bypass any rod block limits enforced by RWM.

- A. **Incorrect** - See description above.
- B. **Incorrect** - See description above.
- C. **Correct** - See description above.
- D. **Incorrect** - See description above.

**Reference(s) provided to the student:**

None

**K/A: 2.2. 44**

Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.

**LESSON PLAN/OBJECTIVE:**

EOP-103-LP-20314, "EOP 103: EOP Control Rod Insertion Methods", EO 001.031.A.03 & 05

**Reference(s) used to develop this question:**

31EO-EOP-103-1, "Control Rod Insertion Methods"  
34SO-C11-005-1, "Control Rod Drive System"  
EOP-103-LP-20314, "EOP 103: EOP Control Rod Insertion Methods"

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72. G2.3.05 001/3//MSL RAD ALARM/BANK/HIGHER/HT2009-302/RO/FNF/CME

**Unit 2** has been at 100% power for 7 days.

- Steam Tunnel Normal Full Power Background (FPB) radiation is 1,000 mr/hr.
- Main Steam Tunnel radiation increases to 2,800 mr/hr.

Which ONE of the choices below completes the following statements?

For these conditons the control room operator \_\_\_\_\_ expect "MAIN STEAM LINE RADIATION HIGH" (601-425) annunciator to be in alarm.

With no operator actions, and if radiation levels contine to increase, the LOWEST radiation level at which the "MAIN STEAM LINE RADIATION HIGH-HIGH" (603-125) annunciator is expected to alarm is \_\_\_\_\_.

- A. would;  
3,000 mr/hr
- B.✓ would;  
9.9E+5 mr/hr
- C. would NOT;  
3,000 mr/hr
- D. would NOT;  
9.9E+5 mr/hr

**Description;**

Per 34AB-B21-001-2

- At less than 20% RTP, the 603-125, MAIN STEAM LINE RADIATION HIGH-HIGH/INOP, annunciator setpoint is based on normal full power background/non-hydrogen injection conditions (typical 2.5 x FPB). IF the High-High annunciator setpoint is reached, the annunciator will alarm AND automatic actions will occur.
- At greater than 20% RTP, the Hi-Hi setpoint is set to 9.99 E5 mr/hr. However, the Hi annunciator has been set to 2.5 x FPB AND will alarm IF MSL rad levels reach 3 x Normal full power background. Therefore the operator can rely on the annunciator for indication of MSL rad levels having reached 3 x Normal full power background.

A. **Incorrect** This answer would be correct if Reactor power was <20%.

B. **Correct** See description above.

C. **Incorrect** 1st part is incorrect if the candidate does not remember that alarm 601-425 is set for 2.5 FPB at >20% RTP. 2nd part is incorrect if the candidate does not remember that alarm 603-125 is set for 9.9E+5 at >20% RTP.

D. **Incorrect** 1st part is incorrect if the candidate does not remember that alarm 601-425 is set for 2.5 FPB at >20% RTP. 2nd part is correct.

**Reference(s) provided to the student:**

None

**K/A: 2.3. 05**

Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.

**LESSON PLAN/OBJECTIVE:**

B21-SLLS-LP-01401 EO 200.098.A.01

**Reference(s) used to develop this question:**

34AB-B21-001-2 "Main Steam Line High Radiation Or Suspected Fuel Element Failure"

**Unit 1** is shutting down for a refueling outage.

- o A normal "Initial" Drywell (DW) entry at power is required.

Which ONE of the choices below completes the following statement IAW 31GO-OPS-005-0, "Primary Containment Entry."

Before a normal "Initial" DW entry is allowed, Oxygen (O<sub>2</sub>) concentration must be at least \_\_\_\_\_ and reactor power must be less than or equal to \_\_\_\_\_.

- A.  19.5%;  
10%
- B. 19.5%;  
15%
- C. 23.5%;  
10%
- D. 23.5%;  
15%

**Description:**

31GO-OPS-005-0 states that for a normal DW entry, the minimum O<sub>2</sub> requirement is 19.5% and the maximum reactor power is 10%.

23.5% O<sub>2</sub> corresponds to the maximum O<sub>2</sub> concentration allowed (step 6.3 of 31GO-OPS-005-0). The examinee may select 23.5% on either confusing the max with the min allowed level of O<sub>2</sub>, or simply not remembering the limit.

15% power corresponds to the TS power level requiring O<sub>2</sub> level in the DW to be less than 4.0 volume percent.

**Reference(s) provided to the student:**

None

**K/A: 2.3.13**

Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.

**LESSON PLAN/OBJECTIVE:**

**Reference(s) used to develop this question:**

**2009-301 2009 NRC EXAM Q#73**

31GO-OPS-005-0, "Primary Containment Entry"

74. G2.4.26 001/3//FIRE/NEW/FUND/HT2009-302/RO/FNF/CME

**Both Units** are at 100% power when a fire occurs in the Cable Spreading Room.

Which ONE of the choices below completes the following two statements?

The Cable Spreading Room has a CO<sub>2</sub> system that \_\_\_\_\_ start(s) and spray(s) into the room.

IAW 34AB-X43-001-1, Fire Procedure, if any CO<sub>2</sub> intrusion is detected in the Control Room, personnel \_\_\_\_\_ required to abandon the control room.

- A. automatically;  
are
- B. automatically;  
are NOT
- C. requires a pushbutton depressed to;  
are
- D. requires a pushbutton depressed to;  
are NOT

**Description:**

The Cable Spreading Room has a semi-automatic system that requires a manual pushbutton to be depressed.

The Fire Procedure requires SCBAs to be worn when <19.5% O2 concentration.

The candidates may select automatic actuation since the system is a semi-automatic.

The candidates may select abandonment since this could occur based upon Control Room conditions but this is only decided by the Shift Supervisor IAW 31RS-OPS-001.

A. **Incorrect**

B. **Incorrect**

C. **Correct**

D. **Incorrect**

**Reference(s) provided to the student:**

None

**K/A: 2.4. 26**

Knowledge of facility protection requirements, including fire brigade and portable fire fighting equipment usage.

**LESSON PLAN/OBJECTIVE:**

X43-FPS-LP-03601, LT-12, LT-15

**Reference(s) used to develop this question:**

X43-FPS-LP-03601

34AB-X43-001-1

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75. G2.4.49 001/3//ECCS/NEW/HIGHER/HT2009-302/RO/FNF/CME

**Unit 2** is at 100% power when a loss of feedwater heating occurs and reactor power starts increasing.

IAW 34AB-N21-001-2, "Loss Of Feedwater Heating" Section 3.0 Immediate Operator Actions, the HIGHEST power allowed to be maintained is \_\_\_\_\_ and the power reduction will be made by using the ASD Master Recirc Flow Control LOWER \_\_\_\_\_ pushbutton.

- A. 79%;  
FAST
- B. 79%;  
MEDIUM
- C. 99%;  
FAST
- D. 99%;  
MEDIUM

---

**Description:**

Maintain Reactor power BELOW the steady state power level prior to the feedwater temperature reduction via recirc using the Master Recirc Flow Control LOWER FAST pushbutton per 34SO-B31-001-2 AND 34GO-OPS-005-2.

**A. Incorrect** - 79% would be selected if the operator remembers the subsequent actions of reducing more than 20% pre-event power level.

**B. Incorrect** - 79% would be selected if the operator remembers the subsequent actions of reducing more than 20% pre-event power level.

**C. Correct** -

**D. Incorrect** - LOWER MEDIUM would be selected because the 34AB procedure says to lower per 34SO-B31-001-2. This procedure states the speeds at which the buttons reduce speed (and thus power). FAST lowers at 100 rpm decrease and the MEDIUM is at 5 rpm decrease. If used at 100% power, the FAST pushbutton will immediately lower power to less than 99% (overshoot) so if the operator does not remember that FAST is required, may feel that MEDIUM will provide the control to reach 99% power (Note: Power must be 99% or LESS, the overshoot low is allowed).

**Reference(s) provided to the student:**

None

**K/A: 2.4. 49**

Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.

**LESSON PLAN/OBJECTIVE:**

N22-MSRFW-LP-01501, LT-25

**Reference(s) used to develop this question:**

34AB-N21-001-2

N22-MSRFW-LP-01501