Final Submittal

(Blue Paper)

COMBINED RO/SRO WRITTEN EXAM

WITH KAS, ANSWERS, REFERENCES,

HATCH DECEMBER 2007 EXAM

05000321/2007301 AND 05000366/2007301

DECEMBER 3 - 6, 2007, AND
DECEMBER 10, 2007, (WRITTEN)

QUESTIONS REPORT

for RO Final Version 11.26.2007

1. 201002K1.04 001/2/2/RBM/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Unit 1 is at 85% power with the Control Rod Weekly Exercise, 34SV-C11-003-1, in progress.

When the operator selects and withdraws control rod 26-35 one notch, Rod Block Monitor (RBM) "A" immediately reaches 120%.

Which ONE of the following describes how the reactor manual control system will respond?

A. The rod settle function will NOT occur.
Only the **RBM UPSCALE OR INOPERATIVE** annunciator will alarm.
NO other annunciators will be received.

B. The rod settle function will NOT occur.
RBM UPSCALE OR INOPERATIVE annunciator will alarm.
ROD OUT BLOCK annunciator will alarm.

C. The rod settle function will occur.
Only **RBM UPSCALE OR INOPERATIVE** annunciator will alarm.
NO other annunciators will be received.

D. The rod settle function will occur.
RBM UPSCALE OR INOPERATIVE annunciator will alarm.
ROD OUT BLOCK annunciator will alarm.

A. Incorrect because the rod block will cause the rod settle function to occur. Also incorrect because a Rod Out Block alarm will also be received. Plausible because the settle function can be interrupted (using another RMCS switch). Also plausible if applicant does not know the power based RBM setpoints.

B. Incorrect because the rod block will cause the rod settle function to occur. Plausible because there are times when the settle function is interrupted (using another RMCS switch).

C. Incorrect because both RBM upscale and Rod Out Block alarms will be received. Plausible if applicant does not know the power based RBM setpoints.

D. Correct.

K1. Knowledge of the physical connections and/or cause effect relationships between REACTOR MANUAL CONTROL SYSTEM and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8)
K1.04 Rod block monitor: Plant-Specific . . . . . 3.5 / 3.6

References
34AR-603-202-2, RBM Upscale or Inoperative annunciator procedure
34AR-603-238-2, Rod Out Block annunciator procedure
34AR-603-239-2, RMCS/RWM Rod Block or System Trouble annunciator procedure
C11-RMCS-LP-05401, Reactor Manual Control System lesson plan
C51-PRNM-LP-01203, Power Range Neutron Monitoring System lesson plan

1- Added Unit 1 in bold.
2- deleted /2 from procedure #.
3.- "the" RBM insinuates we only have 1, Change the RBM to A RBM.
4- Delete central control rod and state control rod # 22-35
5- **The RBM should null at 100 and not exceed the setpoint when a rod is selected.** Also there is an upscale and downscale setpoint that can be exceeded. Added statement about nulling and RBM readings.
6- Made stem and answer choices in present tense instead of past tense.

RFA Approved 10/23/2007

7- BLC: changed question to ask how RMCS responds when RBM causes a rod block during rod movement. This was necessary to make the question more operationally oriented. 11/24/07

Tier:	2	Group:	2
Keyword:	RBM	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

2. 202001A2.07 002/2/2/RECIRC/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Unit 1 is operating with both recirc pumps speed at 80% and the operator is raising power using the Master Recirc Flow Control in Manual. During this evolution, a speed mismatch develops such that the "1A" recirc pump speed demand is 88% with actual pump speed at 80%.

Which ONE of the following predicts how the "1A" recirc pump speed control system will respond?

The scoop tube _____ lock and the PF lamp on the M/A station _____ be flashing.

A. will / will

B. will / will NOT

C. will NOT / will

D. will NOT / will NOT

Note: This error (demand vs actual > 7%) causes a signal failure alarm. A signal failure causes a scoop tube lock and causes the PF lamp to flash. The PF lamp cannot be reset until speed and speed demand are within 7 %.

A. Correct.

B. Incorrect because the PF lamp will also be flashing. Plausible because the Yokagawa controllers are used on several Hatch systems and the PF lamp is programmable to flash on different features.

C. Incorrect because a mismatch between actual speed and speed demand occurs which will be greater than 7% delta, which causes a scoop tube lock AND starts the PF lamp flashing. Plausible if the applicant does not know that 7% is the threshold. Plausible because the Yokagawa controllers are used on several Hatch systems and the PF lamp is programmable to flash on different features.

D. Incorrect because a mismatch between actual speed and speed demand occurs which will be greater than 7% delta, which causes a scoop tube lock AND starts the PF lamp flashing. Plausible if the applicant does not know the 7% threshold for a speed mismatch.

A2. Ability to (a) predict the impacts of the following on the RECIRCULATION 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)
A2.07 Recirculation pump speed mismatch: Plant-Specific . . . . . 3.1 / 3.3

References
34SO-B31-001-1, Reactor Recirc System operating procedure
34AB-B31-001-1, Reactor Recirculation Pump(s) trip, or Recirc Loops flow Mismatch AOP
B31-RRS-LP-00401, Reactor Recirculation System lesson plan

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1- Add and bold Unit # (1) - References Unit 1, plausibility for "C" distractor Unit 2 (44%), "C" distractor Unit 1 (55%), Change plausibility for "C" distractor to 55%
2- Shorten stem to say the valve closes and the pump trips, since the 2nd paragraph of the stem insinuates the pump trips, since the pump restart actions are asked.
3- Add "some of the required recovery actions necessary prior to", since this is not all of the actions required to restart the pump.
4- To bullet proof "A" and "B" distractors, add that the PF lamp is flashing or not flashing to distractors "A" and "B", because the reason for depressing the runback pushbutton is to reset the flashing PF lamp. The pump will restart without depressing the runback. (Tested on Desktop Simulator)
5- Licensee had concerns that the question scope was beyond the K/A because question asked how speed mismatch affected the pump re-start process (vs a running pump).

RFA Approved 10/23/2007 (Update distractor analysis)
BLC changed question w/ licensee 11/20/07 to address item#5 above. Distractor analysis updated 11/24/07

Tier:	2	Group:	2
Keyword:	RECIRC	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

3. 202002K4.03 001/2/2/RECIRC/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Unit 1 is operating at 100% power with the recirc system operating as follows:

1B31-R620, Master Recirc Flow Control: MANUAL
1B31-R621A, Pump A Speed Control: MANUAL
1B31-R621B, Pump B Speed Control: MANUAL

The following alarms are received:

FLUID DRIVE A SCOOP TUBE LOCK (602-126-1)
SPEED CONTROL A SIGNAL FAILURE (602-132-1)

NO other alarms are present on any Control Room Panels.

Which ONE of the following conditions caused this condition?

A. The master recirc controller's output signal failed low.

B. ✓ The individual recirc controller's output signal failed low.

C. Loss of Instrument Bus "A" (1R25-S064).

D. Loss of power to the scoop tube positioner.

Note: The master controller (in manual) is normally used to control speed of both pumps with their controllers in AUTO. The applicant must recognize that this lineup is different than the normal lineup.

A. Incorrect because this would also result in the "B" signal failure annunciator. Plausible if applicant thinks that this lineup reflects the master controller controlling both recirc pumps.

B. Correct.

C. Incorrect because there are several other alarms and lost indications that would occur. Plausible since this is the power supply to the master and "A" recirc controllers are affected and also because these two alarms would also be in alarm condition.

D. Incorrect because this condition does not result in a speed control signal failure provided the unit is operating steady state, i.e., no runback or speed changes in progress. Plausible since this loss of power will cause a scoop tube lock.

K4. Knowledge of RECIRCULATION FLOW CONTROL SYSTEM design feature(s) and/or interlocks which provide for the following: (CFR: 41.7)
K4.03 Signal failure detection: Plant-Specific . . . . . 3.0 / 3.0

References
B31-RRS-LP-00401, Reactor Recirculation System lesson plan
34AR-602-126-1, Fluid Drive A Scoop Tube Lock annunciator procedure
34AR-602-132-1, Speed Control A Signal Failure annunciator procedure

1- Bold Unit 1
2- Add a blank line and bold "No other alarms present on any Control Room Panels". Being next to the bolded, allcaps, annunciator titles mask an important point.
3- Distractor "C" delete "Vital AC ", add Unit designator to R25-S064

RFA Approved 10/23/2007
BLC updated distractor analysis only 11/19/2007

Tier:	2	Group:	2
Keyword:	RECIRC	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

4. 203000K2.02 002/2/1/LPCI/NEW/HIGHER/HT2007-301/RO/BLC/RFA

A leak in the drywell has occurred on **Unit 1** and the following conditions currently exist:

- Reactor level +20"
- Reactor pressure is 750 psig
- Drywell pressure 2 psig
- 1R24-S018A is de-energized

Which ONE of the following describes how the LPCI system will respond if reactor pressure subsequently lowers to 160 psig?

A. LPCI Loop A and B will both inject.

B. LPCI Loop A will be dead-headed.
LPCI Loop B will inject.

C. LPCI Loop A will NOT inject but will be running on minimum flow.
LPCI Loop B will inject.

D. Neither LPCI Loop will inject.

Note: The F007A (min flow normally open) and F015A (injection valve normally closed) have lost power.

A. Incorrect because Loop A will not have power to the inboard injection valve E11-F015A. Plausible if applicant does not know the power supply to the valve.

B. Incorrect because the Loop A min flow valve E11-F007A is normally OPEN. This path will remain available even if the power supply is lost. Plausible if applicant thinks the min flow valve position is normally closed or does not know the power supply.

C. Correct

D. Incorrect because LPCI loop B is unaffected. Plausible if applicant does not know that an initiation signal exists.

203000 LPCI
K2. Knowledge of electrical power supplies to the following: (CFR: 41.7) K2.02 Valves . 2.5* / 2.7*

References
E11-RHR-LP-00701, RHR System lesson plan
34SO-E11-010-1, RHR System operating procedure
Hatch Electrical Distribution diagram.

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1- Bold Unit 1
2- Bullet conditions
3- To bullet proof - Add " subsequently lowers from 750 psig to 160 psi". If Rx pressure was below 449 psig before S018A was lost "A" would be a correct answer. Even though a small amount of injection may start to inject at 200 psig, our surveillance (34SV-E11-001-1) only requires 161 psid for full flow. Tech Spec requires full flow for a Rx, pressure of >20 psi.
4- Change Loop 1 and 2, to Loop A and B

RFA Approved 10/23/2007
BLC updated distractor analysis only 11/19/07

Tier:	2	Group:	1
Keyword:	LPCI	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

5. 205000K3.01 001/2/1/SHUTDOWN CLG/NEW/HIGHER/HT2007-301/RO/BLC/RFA

The following conditions exist on **Unit 2**:

- Reactor pressure 100 psig
- MSIVs closed
- "B" Loop RHR in shutdown cooling with a cooldown in progress
- "A" Loop RHR in standby lineup

Which ONE of the following describes how the plant will be affected if an RPS MG set trip occurs? (assume no operator action)

Reactor pressure will _____ ; a mode change _____ occur.

A. lower; will

B. lower; will NOT

C. rise; will

D. rise; will NOT

A. Incorrect because a shutdown cooling isolation will occur and this will cause a heatup. Also incorrect because the plant is currently in Mode 3 as indicated by reactor pressure. Plausible if applicant does not know that RPS MG set trip causes isolation.

B. Incorrect because a shutdown cooling isolation will occur and this will cause a heatup. Plausible if applicant does not know that RPS MG set trip causes isolation.

C. Incorrect because the plant is already in Mode 3 as indicated by reactor pressure. Plausible if applicant thinks that the plant is in cold shutdown and will transverse into Mode 3 during the heatup.

D. Correct.

K3. Knowledge of the effect that a loss or malfunction of the SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) will have on following: (CFR: 41.7 / 45.4) K3.01 Reactor pressure . 3.3 /3.3

References
34AB-C71-002-2, Loss of RPS AOP
E11-RHR-LP-00701, RHR System lesson plan
34AB-E11-001-2, Loss of Shutdown Cooling AOP

1- Bold Unit 2
2- Bullet conditions
3- Put MSIVs closed on seperate line

RFA Approved 10/23/2007

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Tier:	2	Group:	1
Keyword:	SHUTDOWN CLG	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

6. 206000A1.01 001/2/1/HPCI/MOD BANK/HIGHER/HT2007-301/RO/BLC/RFA

Unit 2 HPCI auto-initiated and injected following the loss of both Reactor Feedwater Pumps and then subsequently tripped on RPV high water level. The following conditions currently exist:

- RPV water level is +20 inches and slowly lowering
- Drywell pressure is 1.5 psig and slowly rising

Given these current plant conditions, which ONE of the following choices will complete the following statement to describe the HPCI logic?

"If the operator depresses the ...

A. HI REACTOR WATER LEVEL TRIP RESET pushbutton, then HPCI will re-start and inject after 2E41-F006, HPCI Injection Valve, re-opens.

B. HI REACTOR WATER LEVEL TRIP RESET pushbutton, HPCI will NOT re-start.

C. INITIATION SIGNAL RESET pushbutton, HPCI will re-start but NOT inject.

D. INITIATION SIGNAL RESET pushbutton, then HPCI will re-start and inject after 2E41-F006, HPCI Injection Valve, re-opens.

Note: The initiation signal light (white light) is currently illuminated. This light informs the operator that an initiation signal has occurred sometime in the past. HPCI is currently not running even though level is below the high level trip setpoint.

A. Correct.

B. Incorrect because HPCI will restart. Plausible if applicant thinks that no initiation signal currently exists.

C. Incorrect because this pushbutton will not result in HPCI starting. Plausible if applicant thinks that flow controller takes its signal from reactor level (vs flow).

D. Incorrect because this pushbutton will not result in HPCI starting. Plausible if applicant thinks that current drywell pressure is auto-initiation setpoint. (vs 1.85 psig)

A1. Ability to predict and/or monitor changes in parameters associated with operating the HIGH PRESSURE COOLANT INJECTION SYSTEM controls including:
(CFR: 41.5 / 45.5) A1.01 Reactor water level: BWR-2,3,4 . .. . 4.3* / 4.4*

References
34SO-E41-001-2, HIGH PRESSURE COOLANT INJECTION (HPCI) SYSTEM
E41-HPCI-LP-00501, HPCI Lesson Plan
Modified from Initial Exam Bank item LT-LP-005001 020/LT-LP-00501-05

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1- Add Unit 2
2- Add bullets to conditions
3- To bullet proof Change "Immediately" to "inject after 2E41-F006, HPCI Injection Valve, re-opens" in A and D. Takes several seconds for HPCI F001 to open, Then the F006 starts opening. There is some delay in injection after resetting the High Water Level Signal.
4- Underline NOT in B distractor to match NOT in C distractor

RFA Approved 10/23/2007
BLC Updated distractor analysis only 11/19/07

Tier:	2	Group:	1
Keyword:	HPCI	Source:	MOD BANK
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

7. 206000K5.06 001/2/1/HPCI/NEW/FUND/HT2007-301/RO/BLC/RFA

Which ONE of the following describes the **Unit 1** HPCI mechanical overspeed trip?

A. ✓ The stop valve begins closing, turbine speed lowers and then the stop valve re-opens when turbine speed is below the reset speed value. The F006 injection valve will remain open.

B. The stop valve fully closes and remains closed until the ball and tappet is locally reset. The F006 injection valve will remain open.

C. The F006 injection valve will fully close and remain closed until the ball and tappet is locally reset. When the F006 injection valve closes, the stop valve fully closes.

D. The control valve begins closing, turbine speed lowers and then the control valve re-opens when turbine speed is below the reset speed value. The F006 injection will remain open.

A. Correct.

B. Incorrect because the mech overspeed trip is "self-resetting." The ball and tappet do not require a local reset. Plausible if applicant thinks HPCI is similar to RCIC.

C. Incorrect because the F006 will not close on a mech overspeed trip due to the self-resetting feature on HPCI. Also incorrect because the ball and tappet do not require local reset. Plausible if applicant thinks the F006 valve is the initiating component on the trip. Also plausible if applicant thinks HPCI is similar to RCIC.

D. Incorrect because the control valve will respond to maintain pump flow. The mechanical overspeed is not associated with the control valve. Plausible if applicant thinks that the control valve is modulated based on turbine speed.

K5. Knowledge of the operational implications of the following concepts as they apply to HIGH PRESSURE COOLANT INJECTION SYSTEM:
(CFR: 41.5 / 45.3) K5.06 Turbine speed measurement: BWR-2,3,4 . . 2.6* / 2.6

References
E41-HPCI-LP-00501, HPCI System lesson plan
1- Add Unit #

RFA Approved 10/23/2007

Tier:	2	Group:	1
Keyword:	HPCI	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

8. 209001G2.1.31 001/2/1/CORE SPRAY/NEW/FUND/HT2007-301/RO/BLC/RFA

Unit 1 is operating at 100% power. At the completion of the 34SV-E21-002-1, Core Spray Valve Operability Surveillance, while performing the Standby Lineup attachment of 34SO-E21-001-1, Core Spray System, the Independent Verifier observes the following control board indications :

- 1E21-F001B, torus suction valve.....OPEN
- 1E21-F019B, torus suction valve.....OPEN
- 1E21-F004B, outboard discharge valve..... CLOSED
- 1E21-F005B, inboard discharge valve..... OPEN
- 1E21-F031B, min flow valve.....CLOSED

Which ONE of the following describes how the above lineup compares to the required standby lineup and also describes the valve logic?

A. The lineup is correct.

   If the min flow valve is opened, it will auto-close.

B. ✔ The min flow valve position AND both discharge valves' position are incorrect.

   The discharge valves can be realigned by first closing the F005B and then opening the F004B.

C. The min flow valve position is incorrect; however, both discharge valves' position are correct.

   If the min flow valve is opened, it will stay open.

D. Both discharge valves' position are incorrect; however, the min flow valve position is correct.

   The discharge valves can be realigned by first closing the F005B and then opening the F004B.

Note: 34SV-E21-002-2, Rev 8.9 page 11 of 22 requires removing a link during the surveillance to allow the min flow valve to remain closed for a valve stroke. The stem is plausible if the link was not re-installed. (otherwise the min flow valve won't stay closed with no flow)

A. Incorrect because the min flow valve position is not correct AND the discharge valves' positions are not correct. Plausible if applicant does not know the required standby core spray lineup. Also plausible if the applicant mentally reverses the min flow valve logic, i.e., will travel open if closed under normal standby conditions.

B. Correct.

C. Incorrect because the F004 and F005 positions are backwards. Plausible if applicant knows the normal position of the min flow valve but does not know the required standby lineup for the discharge valves.

D. Incorrect because the min flow valve should be open. Plausible if applicant knows the discharge valve position requirements but does not know the normal position of the min flow valve.

SYSTEM: 209001 Low Pressure Core Spray System
2.1.31 **Ability to locate control room switches / controls and indications and to determine that they are correctly reflecting the desired plant lineup.** (CFR: 45.12) IMPORTANCE RO 4.2 / SRO 3.9

References
34SO-E21-001-1, Attachment 3 (pg 2 of 8), Main Control Room Panel valve lineup sheet
34SO-E21-001-1, Attachment 8 (page 1 of 3), General System Information for F005/F004
34SV-E21-002-2, Rev 8.8 & 8.9, Section 7.2.4, Valve 2E21-F031A, Min Flow Vlv

1- Deleted "/2" from procedure # to make it unit 1, same as the reference. Added Unit designator to valve #s. Changed to Unit 1 in bold.
2- Change 34SV-E21-001-1 (pump surv) to 34SV-E21-002-1(valve Surv). All these valves will actually be manipulated in the valve surv. and the same valve lineup is required as the pump surv. after completion.
3- Changed second party verifier to Hatch term Independent Verifier.
4- Added "while performing the Standby Lineup attachment of 34SO-E21-001-1, Core Spray System"
5- Bulleted conditions

RFA Approved 10/23/2007
BLC updated distractor analysis only 11/19/07

Tier:	2	Group:	1
Keyword:	CORE SPRAY	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

9. 211000K2.01 001/2/1/SLC/BANK MOD/HIGHER/HT2007-301/RO/BLC/RFA

Due to an electrical transient on **Unit 2**, 600 V bus 2C is lost. Which ONE of the following describes how this power failure affects the SBLC system?

A. Both amber squib valve indications will be OFF on the 2H11-P603 panel. ONLY the 'B' squib valve will fire, if the SBLC switch is placed in the 'Start Sys B' position.

B. Both amber squib valve indications will be OFF on the 2H11-P603 panel. Both squib valves will fire if the SBLC switch is placed in either the 'Start Sys A' OR 'Start Sys B' position.

C. Both amber squib valve indications will be ON on the 2H11-P603 panel. ONLY the 'B' squib valve will fire, if the SBLC switch is placed in the 'Start Sys B' position.

D. Both amber squib valve indications will be ON on the 2H11-P603 panel. Both squib valves will fire if the SBLC switch is placed in either the 'Start Sys A' OR 'Start Sys B' position.

600VAC 2C supplies 2R24-S011 (SLC pump 2A breaker). 2R24-S011 supplies 2R25-S101 (SLC instrumentation & indicating lights for BOTH systems).

A. Correct.

B. Incorrect because the A squib valve doesn't have breaker power. Plausible because normally both squib valves fire irrespective of the position of the SBLC switch, i.e., in either position fires both squib valves.

C. Incorrect because the amber lights will be OFF. Plausible if applicant does not know the power supply to the SLC control board indications (different) vs the pump breakers.

D. Incorrect because the amber lights will be OFF. Also incorrect because the 'A' squib valve doesn't have power therefore both squib valves will not fire. Plausible if the applicant does not know the power supply to the SLC control board indications (different) vs the pump breakers. Also plausible since normally both squib valves fire irrespective of the switch position, i.e., both valves fire in system A or system B positions.

K2. Knowledge of electrical power supplies to the following:
(CFR: 41.7) K2.01 SBLC pumps . . . . . 2.9* / 3.1*

References
C41-SBLC-LP-01101, SLC lesson plan
Initial License Exam Bank Modified question: LT-LP-011001 001/LT-LP-01101-03/011.001.A.04

QUESTIONS REPORT

for RO Final Version 11.26.2007

1- Added Unit 2 in bold

RFA Approved 10/23/2007

Tier:	2	Group:	1
Keyword:	SLC	Source:	BANK MOD
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

10. 212000K2.02 001/2/1/ATTS/BANK/FUND/HT2007-301/RO/BLC/RFA

On **Unit 2,** Which ONE of the following is a normal operating status light lineup, i.e., NO ALARM CONDITIONS, for Analog Transmitter Trip System (ATTS) Panel 2H11-P925?

	TRIP STATUS/MTU	STATUS/MTU	GROSS FAIL/MTU	POWER ON/P925
A.	ON/GREEN	ON/GREEN	ON/GREEN	ON/GREEN
B.	OUT	ON/GREEN	OUT	ON/CLEAR
C.	ON/AMBER	OUT	ON/GREEN	ON/RED
D.	OUT	ON/RED	OUT	ON/GREEN

This question is straight from the licensee's initial exam bank. (minor modifications only)

A. Incorrect because trip status light is ON. Also incorrect because the gross failure light is ON. Also incorrect because the power status lights are clear (vs green). Plausible if the applicant thinks that the normal arrangement is for all lights to be on.

B. Correct.

C. Incorrect because the trip status lights are normally off and they are green (vs amber). The trip unit status light is normally on and the power status light is clear (vs red). Plausible if the applicant thinks that the unit does not currently have a trip signal and reverses the gross failure light logic.

D. Incorrect because the trip unit status light is green (vs red) and the power supply status light is clear (vs green). Plausible if the applicant does not know the correct lens color for the power supply and status lights.

K2. Knowledge of electrical power supplies to the following:
(CFR: 41.7) K2.02 Analog trip system logic cabinets . . . . . 2.7 / 2.9

References
H11-ATTS-LP-10008, Analog Transmitter Trip System lesson plan.
Initial exam bank test item # LT-LP-55001 028/LT-LP-10008-05

1- Added "On **Unit 2,**" and "2H11-" to P925 panel

RFA Approved 10/23/2007
BLC updated distractor analysis only 11/19/07

QUESTIONS REPORT

for RO Final Version 11.26.2007

Tier:	2	Group:	1
Keyword:	ATTS	Source:	BANK
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

11. 212000K4.07 001/2/1/RPS/NEW/FUND/HT2007-301/RO/BLC/RFA

Refueling is in progress.

Which ONE of the following describes the reactor protection system (RPS) manual scram logic, with the shorting links removed?

A. On Unit 1, the manual scram pushbutton will NOT de-energize an automatic scram channel.

   When SRM "A" reaches 3X10E5 cps, a reactor scram will occur.

B. On Unit 1, a manual scram pushbutton will de-energize an automatic scram channel.

   When SRM "A" reaches 7X10E4 cps, a reactor scram will occur.

C. On Unit 2, the manual scram pushbutton will NOT de-energize an automatic scram channel.

   When SRM "A" reaches 3X10E5 cps, a reactor scram will occur.

D. On Unit 2, the manual scram pushbutton will de-energize an automatic scram channel.

   When SRM "A" reaches 7X10E4 cps, a reactor scram will occur.

A. Correct.

B. Incorrect because manual scram pushbutton on U1 does not input to the auto-scram channels. Also incorrect because the scram setpoint is 10E5 (vs 10E4). Plausible if applicant does not know unit difference and because this is the rod block setpoint.

C. Incorrect because each manual scram pushbutton on U2 de-energizes an AUTO scram channel, i.e., A1, A2, B1, B2. Plausible since this is not true on U1.

D. Incorrect because the scram setpoint is 10E5 (vs 10E4). Plausible because this is the rod block setpoint.

K4. Knowledge of REACTOR PROTECTION SYSTEM design feature(s) and/or interlocks which provide for the following: (CFR: 41.7)
K4.07 Manual system activation (trip) . . . . . 4.1* / 4.1

References
C71-RPS-LP-01001, RPS lesson plan

QUESTIONS REPORT
for RO Final Version 11.26.2007

1- Delete reference to Shorting Links in second half of distractors. Add that Unit 1 is in refuel and that the shorting links are removed. The number of shorting links is insignificant to how the logic operates. Adding "An INOP trip on IRM "A" will cause a Full(or half) reactor scram" is a much more significant point about the shorting links and more closely matches the K/A.
2- Add "**Unit 1** is in **Refuel**."

RFA Approved 10/23/2007 (Perform analysis)
BLC updated distractor analysis only 11/19/07

Tier:	2	Group:	1
Keyword:	RPS	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

12. 215003K4.06 001/2/1/IRM/NEW/HIGHER/HT2007-301/RO/BLC/RFA

A **Unit 2** startup is in progress. The plant operator inadvertently downranges IRM "G" from range 4 to range 3 and the following annunciators are received:

- **IRM BUS A UPSCALE TRIP OR INOP** (603-203-1S)
- **REACTOR NEUTRON MONITORING SYS TRIP** (603-109-1)
- **REACTOR AUTO SCRAM SYSTEM A TRIP** (603-117-1)
- **IRM UPSCALE** (603-221-1)
- **ROD OUT BLOCK** (603-238-1)

The operator quickly realizes his mistake and ranges IRM "G" to range 5 where it indicates ~ 7 on the 0 - 40 Scale. No further actions have yet been taken.

At this point, which ONE of the following describes the upscale (amber) and upscale trip (red) lamp indications on the P603 panel apron section and on the IRM drawer on panel P606?

A. The amber and red lamps on the P603 panel apron section are OFF.
The amber and red lamps on the IRM drawer at panel P606 are still ON.
ONLY the reset switch on the IRM drawer is required to clear the lamps.

B. The amber and red lamps on the P603 panel apron section are still ON.
The amber and red lamps onthe IRM drawer at panel P606 are still ON.
ONLY the 1/2 scram reset is required to clear the lamps at P603.
ONLY the reset switch on the IRM drawer is required to clear the lamps at P606.

C. ONLY the amber lamp on the P603 panel apron section is still ON. (red is OFF)
ONLY the amber lamp at the IRM drawer P606 panel is still ON. (red is OFF)
ONLY the reset switch on the IRM drawer can be used to clear the P603 & P606 amber lamps.

D. The amber and red lamps on the P603 panel apron section are both OFF.
ONLY the amber lamp at the IRM drawer P606 panel is ON. (red light is OFF)
ONLY the reset switch on the IRM drawer can be used to clear the P606 amber lamps.

A. Correct.

B. Incorrect because all the lamps at P603 went off when the IRM was ranged correctly. Also incorrect because these lights went off by themselves, i.e., don't require the 1/2 scram reset. Plausible if applicant knows that a 1/2 scram still exists.

C. Incorrect because all the lamps at P603 went off when the IRM was ranged correctly. Also incorrect because the IRM drawer reset switch does not affect the P603 lamps. Plausible if applicant knows that the reset switch is required to reset the drawer lamps.

D. Incorrect because the red lamp (upscale trip) on the drawer will still be ON even though this lamp is not on at P603. Plausible if applicant knows that the trip signal is clear when the IRM was correctly ranged and because the IRM reset switch is required to turn the drawer lamp off.

K4. Knowledge of INTERMEDIATE RANGE MONITOR (IRM) SYSTEM design feature(s) and/or interlocks which provide for the following: (CFR: 41.7)
K4.06 Alarm seal-in . . . . . 2.6 / 2.6

References
IRM BUS A UPSCALE TRIP OR INOP (603-203-1S)
REACTOR NEUTRON MONITORING SYS TRIP (603-109-1)
REACTOR AUTO SCRAM SYSTEM A TRIP (603-117-1)
IRM UPSCALE (603-221-1)
ROD OUT BLOCK (603-238-1)
C51-IRM-01202, IRM lesson plan

Two types of trip units are used: the upscale trip and the downscale trip. An upscale trip is where the unit produces an output when the signal input rises above the reference input. A downscale trip is where the unit produces an output when the signal input drops below the reference input. Each trip unit produces two types of outputs: seal-in and auto reset. Once a seal-in output is produced, it must be manually reset by operator. An example of a seal-in output is one that drives the local indicator lights on the chassis front. The auto reset output allows the trip signal to reset as soon as the monitored parameter returns within reference limits. This output drives indicators on panel P603 and Reactor Protection or Reactor Manual Control System logic.

1- Add **Unit 2,** break into two sentences
2- Change 30 to 7 on the 0 - 40 Scale. 30 on range 5 (0-40 scale) is a rod block. Also the IRM would have been reading 300 on range 4, which would have already given a scram signal. With the IRM at 7 on range 5, the plausibilty for distractors that indicate the amber light is illuminated on the 603 panel is increased, since the downscale is 10/125 of scale, 7 is a rodblock on range 6 and 4.

RFA Approved 10/23/2007
BLC updated distractor analysis only 11/19/07

Tier:	2	Group:	1
Keyword:	IRM	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

13. 215004A1.01 001/2/1/SRM/NEW/HIGHER/HT2007-301/RO/BLC/RFA

A **Unit 2** startup is in progress with the following conditions:

- Reactor power ~ 1%
- IRMs on range 5 and 6
- All SRM detectors are 90% withdrawn
- None of the SRM detectors are currently being moved

Which ONE of the following is correct for the SRM detector and period indication?

A. Retract permit light is extinguished.
Changes in the SRM period indication reflects core neutron flux changes.

B. Retract permit light is extinguished.
Changes in the SRM period indication do NOT reflect core neutron flux changes.

C. Retract permit light is illuminated.
Changes in the SRM period indication do NOT reflect core neutron flux changes.

D. Retract permit light is illuminated.
Changes in the SRM period indication reflects core neutron flux changes.

A. Incorrect because retract permit light will be illuminated. Plausible if the applicant does not know the 200 cps setpoint or does not know logic for SRM detector position.

B. Incorrect because retract permit light will be illuminated. Plausible if the applicant does not know the 200 cps setpoint or does not know logic for SRM detector position.

C. Incorrect because SRM period indication is still valid for neutron flux changes even though detector is fully withdrawn. Plausible if applicant thinks that period indication is not valid w/ detectors fully withdrawn.

D. Correct.

215004 Source Range Monitor
A1. Ability to predict and/or monitor changes in parameters associated with operating the SOURCE RANGE MONITOR (SRM) SYSTEM controls including: (CFR: 41.5 / 45.5)
A1.01 Detector position . . . . . 3.0 / 3.1

References
34GO-OPS-001-2, Plant Startup
C51-SRM-LP-01201, SRM lesson plan
34AR-603-222-2, SRM Detector Retracted When Not Permitted annunciator procedure

Multiple correct answers depending on assumptions.
1- Bold Unit 2, and add bullets to the conditions.
2- Delete "from a refueling outage" and "rx press at 200"
3- To bullet proof - Change IRM range from "8 and 9" to " 5 and 6" so that the detectors are partiallly (90%) withdrawn. The retract permit light will not be illuminated if the SRM is fully withdrawn. Also, Add "SRM detectors are not currently being withdrawn". If SRMs are moving they do not represent core flux changes, they just show how neutron level is changing as the detector is being moved through different neutron fields.
4- Add "SRM detectors are withdrawn 90% from Full-in"
5- Move " Assume that SRM/IRM detector selection power is still ON" to bulleted conditions
6- Delete "actual" from each distractor. Shortens distractors and does not add any benefit.

RFA Approved 10/23/2007

Tier:	2	Group:	1
Keyword:	SRM	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

14. 215005K3.08 001/2/1/THERMAL LIMITS/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Unit 2 is operating at 100% power with no rods selected and the following alarm is received:

LPRM UPSCALE (603-237)

The operator confirms at panel 2H11-P603 that one LPRM is upscale as shown on the LPRM BARGRAPHS function.

Which ONE of the following describes how this will affect the core thermal limit calculations and the requirements for APRM operability?

A. MFLPD and MAPRAT values will rise.
APRM operability requires a minimum of 3 LPRMs per level.

B. MFLPD and MAPRAT values will rise.
APRM operability requires a minimum of 2 LPRMs per level.

C. MFLPD and MAPRAT values will lower.
APRM operability requires a minimum of 3 LPRMs per level.

D. MFLPD and MAPRAT values will lower.
APRM operability requires a minimum of 2 LPRMs per level.

A. Correct

B. Incorrect because APRM operability requires 3 LPRMs per level. Plausible if applicant does not know the requirement; old system used this number.

C. Incorrect because thermal limit values should rise to approach 1. Plausible if applicant thinks that the MFLPD and MAPRAT values are computed by limit/actual (vs actual/limit).

D. Incorrect because thermal limit values should rise to approach 1. Plausible if applicant thinks that the MFLPD and MAPRAT values are computed by limit/actual (vs actual/limit) and if does not know the tech spec requirement for number of operable LPRMs per level; old system used this number.

K3. Knowledge of the effect that a loss or malfunction of the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGEMONITOR SYSTEM will have on following:
(CFR: 41.7 / 45.4) K3.08 †core thermal calculations . . . . . 3.0 / 3.4

References
34AR-603-237-2, LPRM Upscale annunciator procedure
34SV-C51-003-2, LPRM Operational Status

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1- Bold Unit 2
2- Delete "the" panel and add "2" to H11-P603

RFA Approved 10/23/2007
BLC updated distractor analysis only 11/19/07

Tier:	2	Group:	1
Keyword:	THERMAL LIMITS	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

15. 217000A3.03 001/2/1/RCIC/BANK MOD/HIGHER/HT2007-301/RO/BLC/RFA

Unit 2 experienced a dual feed pump trip from 100% power.

- HPCI is inoperable.
- RCIC and CRD are in operation.
- Reactor water level is at -38 inches and is slowly decreasing.

RCIC is operating in automatic with the following control board indications:

- E51-R604 Pump Suction Press 10 psig
- E51-R601 Pump Discharge Press 225 psig
- E51-R602 Turb Inlet Press 910 psig
- E51-R603 Turb Exh Press 10 psig
- E51-R610 Turb Speed 1900 rpm
- E51-R612 Turbine Controller flow 400 gpm

Given these plant conditions, which ONE of the following is required for RCIC, including the reason?

A. Continue to run RCIC.
Raise turbine speed > 2000 rpm by lowering the flow controller automatic setpoint to prevent exhaust check valve damage.

B. Continue to run RCIC.
Raise turbine speed > 2000 rpm by placing the flow controller in MANUAL and then lowering flow using the slider bar to prevent exhaust check valve damage.

C. IMMEDIATELY secure RCIC.
The low suction pressure trip failed.

D. IMMEDIATELY secure RCIC.
RCIC is not injecting into the Rx vessel.

A. Incorrect because the pump discharge pressure should be equivalent to the turb steam inlet pressure, i.e., reactor pressure. A pipe break is indicated. Also incorrect because lowering the flow setpoint will cause rpm to lower even further. Plausible since the system procedure warns that continued operation at turbine speeds < 2000 rpm can cause check valve problems. Plausible if applicant remembers that throttling closed on discharge flowpath will raise rpm in auto. (pressure control mode)

B. Incorrect because the pump discharge pressure should be equivalent to the turb steam inlet pressure, i.e., reactor pressure. A pipe break is indicated. Also incorrect because lowering flow using the slider bar will cause rpm to lower even further. Plausible since the system procedure warns that continued operation at turbine speeds < 2000 rpm can cause check valve problems. Plausible if applicant remembers that throttling closed on discharge flowpath will raise rpm in auto. (pressure control mode)

C. Incorrect because the RCIC low suction pressure trip occurs at 10"Hg vacuum (vs 10 psig positive pressure). Plausible since applicant may not know the units.

D. Correct.

A3. Ability to monitor automatic operations of the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) including: (CFR: 41.7 / 45.7)
A3.03 System pressure . . . . . 3.7 / 3.6

References
E51-RCIC-LP-03901, RCIC system lesson plan
34SO-E51-001-2, Reactor Core Isolation Cooling (RCIC) system operating procedure
Initial License Exam Bank item # LR-LP-039024 007/LR-LP-03901-04

1- Add "Unit 2 experienced", delete "after", change from rated power to 100% power, break into multiple sentences.
2- change stable to slowly decreasing for RWL. (CRD won't maintian stable level this soon after a loss of feedwater with no other system injecting.)
3- Add "HPCI is inoperable." (Will prevent questions from applicants on HPCI status.)
4- Bullet RCIC conditions
5- Change "injecting to the vessel" to "operating" because it it not injecting

RFA Approved 10/23/2007
BLC updated distractor analysis only 11/19/07

Tier:	2	Group:	1
Keyword:	RCIC	Source:	BANK MOD
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

16. 218000K6.02 001/2/1/ADS/BANK MOD/HIGHER/HT2007-301/RO/BLC/RFA

Unit 2 was operating at 100% power with the 2B Core Spray pump out of service (inop).

A loss of offsite power occurred on Unit 2 and the following plant conditions currently exist at time **t = 0**:

- 4KV Emergency buses 2E and 2F are de-energized
- Drywell pressure is 1.5 psig and slowly decreasing
- Reactor water level is -120 inches and steady with RCIC.

Which ONE of the following describes how the automatic depressurization system (ADS) will be affected by these plant conditions?

A. ADS will initiate after ~ 12.7 minutes have elapsed.

B. ADS will initiate as soon as ~ 1.7 minutes have elapsed.

C. ADS will NOT initiate because no RHR pumps are running.

D. ADS will NOT initiate because no Core Spray pumps are running.

Note: Bus 2E provides power to 2A RHR & CS pumps. Bus 2F provides power to 2C & 2D RHR pumps.

A. Correct because the low pressure pump permissive and both times are satisfied.

B. Incorrect because the 11 minute timer is required to time out without high drywell pressure. Plausible if applicant believes that the drywell pressure permissive is satisfied.

C. Incorrect because ADS will initiate after 12.7 minutes. Plausible if applicant does not remember pump power supplies or thinks that it requires two RHR pumps or one Core Spray pump to satisfy the logic permissive.

D. Incorrect because ADS will initiate after 12.7 minutes. Plausible if applicant thinks that the logic requires one core spray and one RHR pump to satisfy pump running logic.

K6. Knowledge of the effect that a loss or malfunction of the following will have on the AUTOMATIC DEPRESSURIZATION SYSTEM : (CFR: 41.7 / 45.7)
K6.02 Low pressure core spray system pressure: Plant-Specific . . . . . 4.1 / 4.1

References
B21-ADS-LP-03801 ADS lesson plan
Initial license exam bank item# LT-LP-038004 005/LP-LP-03801-06
34AR-602-306-2, Auto Blowdown Timers Initiated
34AR-602-305-2, ADS Low Water LVL ACTU Timers Initiated
LFD2-ECCS-23, ADS Trip System LPCI Pump Discharge Pressure-High

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1- Bold Unit 2 and T=0, break between first two sentences, bullet conditions
2- Add "and slowly decreasing" for drywell pressure because if DW press goes above 1.85 ADS will actuate 2 minutes later.
3- Change times from 13 to 12.7 and 2 to 1.7. This is to ensure that the student knows that we are not just using the old name for the timers (13 minute and 2 minute) and that we are using the real times (11 minutes and 102.5 secs.)
4- Change correct answer to A from C. It only takes 1 RHR or 1 CS pump to obtain the pressure permissive for ADS initiation. (Question used in reference had logic failure that did not have any ECCS pumps operating.) Also Changed "D" distractor to make incorrect.
5- Added 34AR-602-306-2, Auto Blowdown Timers Initiated and 34AR-602-305-2, ADS Low Water LVL ACTU Timers Initiated, to references.
6- Updated Plausibility statements

RFA Approved 10/23/2007
BLC updated distractor analysis 11/19/07

Tier:	2	Group:	1
Keyword:	ADS	Source:	BANK MOD
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

17. 219000A3.01 001/2/2/RHR/NEW/HIGHER/HT2007-301/RO/BLC/RFA

An ATWS has occurred on **Unit 2,** with the following conditions:

- APRM power ~ 4%
- MSIVs are open with EHC controlling pressure at 840 psig
- No SRVs are open
- Drywell pressure is 1 psig and steady
- RPV level is being controlled -65" to -75" in accordance with CP-3
- SBLC injection is in progress
- Both loops of RHR are placed in torus cooling using the placard at 2H11-P601
- RHR containment spray valve control and 2/3 core height override switches have not been used and are in their normal line-up position.

While the rods are being inserted, a group 1 isolation occurs. The SRO orders that RPV level be lowered to -130".

Which ONE of the following predicts how the 2E11-F028 (torus spray or test) and 2E11-F024 (torus cooling) valves will respond when RPV level reaches -130", including required actions (if any)?

A. Both valves auto-closed.

If ONLY the containment spray valve control override switch is placed in the MANUAL position, THEN the 2E11-F028 valve will automatically re-open. (2E11-F028 switch not required to be re-opened and 2/3 core height switch not required)

B. Both valves auto-closed.

BOTH the containment spray valve control override switch and the 2/3 core height switch are required to re-open both valves. The sequence of these two switches does not matter, i.e., either switch may be positioned first in order for both valves to be re-opened.

C. The 2E11-F028 valve auto-closed. The 2E11-F024 valve remained open.

If ONLY the containment spray valve control override switch is placed in the MANUAL position, THEN the 2E11-F028 valve will automatically re-open. (2E11-F028 switch not required to be re-opened and 2/3 core height switch not required)

D. The E11-F028 valve remained open. The 2E11-F024 valve auto-closed.

If ONLY the containment spray valve control override switch is placed in the MANUAL position, THEN the 2E11-F024 valve will automatically re-open. (2E11-F024 switch not required to be re-opened and 2/3 core height switch not required)

Note: The E11-F028 is a keylock switch, the F024 is NOT a keylock switch. When the F028 was initially opened, its keylock switch remained in the OPEN position.

A. Correct.

B. Incorrect because the keylock (2/3 core height) must be turned FIRST..then the containment spray valve control switch. Plausible if applicant does not know that the logic requires a sequence.

C. Incorrect because both valves auto-closed. Plausible if applicant knows that the E11-F028 is the upstream keylock isolation valve and its control switch stayed in the open position.

D. Incorrect because both valves auto-closed. Plausible if applicant thinks that E11-F024 has a keylock switch that was positioned earlier.

A3. Ability to monitor automatic operations of the RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE including: (CFR: 41.7 / 45.7)
A3.01 Valve operation . . . . . 3.3 / 3.3

References
34SO-E11-010-2, Attachment 10 and 15: RHRSW Startup Placard and Torus Cooling Initiation Placard

1- Add Unit 2 in Bold, change to 2H11, add 2 infront of valve #s, and bullet conditions
2- Change EHC controlling pressure at 840 psig to match EOP RCA/P requirements tp lower pressure set to <845 psig
3- Bullet the conditions in the paragraph below the conditions and that SBLC is injecting, then delete the sentences containing those conditions.
4- change -150" to -130" because a compensated RWL of -150" (actual RWL) is right at 2/3rds core height indicated RWL and the 2/3rds core height override may be required.

RFA Approved 10/23/2007
BLC updated distractor analysis only 11/19/07

Tier:	2	Group:	2
Keyword:	RHR	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

18. 223002A2.09 002/2/1/PCIS/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Unit 2 is at 20% power and the turbine generator has just been synchronized to the grid. Main condenser vacuum decreases to -5 inches Hg.

Which ONE of the following predicts the status of the main steam line isolation valves and identifies the procedure for depressurizing the reactor to cold shutdown?

A. MSIVs are still open
31EO-EOP-107-2, Alternate RPV Pressure Control

B. MSIVs are still open
34GO-OPS-013-2, Normal Plant Shutdown

C. MSIVs are closed
31EO-EOP-107-2, Alternate RPV Pressure Control

D. MSIVs are closed
34GO-OPS-013-2, Normal Plant Shutdown

Note: The low condenser bypass switches will prevent a Group 1 isolation. These switches are placed in the normal (armed) position during a startup at ~ 1% power.

A. Incorrect because the MSIVs are closed. Also incorrect because Alt RPV Press Ctl only used for cooldown when all other systems are not available iaw 34GO-OPS-013-2, Section 7.5. Plausible if applicant thinks that the condenser low vacuum trip bypass switches are still in the bypass position.

B. Incorrect because the MSIVs are closed. Plausible if applicant thinks that the condenser low vacuum trip bypass switches are still in the bypass position.

C. Incorrect because Alt RPV Press Ctl only used for cooldown when all other systems are not available iaw 34GO-OPS-013-2, Section 7.5. Plausible if applicant thinks that since condenser is unavailable that an "alternate" means of pressure control is required.

D. Correct.

A2. Ability to (a) predict the impacts of the following on the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF ; 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)

A2.09 System initiation . . . . . 3.6 / 3.7

34GO-OPS-001-2, Plant Startup (pp 25 & 39) procedure
34GO-OPS-013-2, Normal Plant Shutdown (p 25) procedure
31EO-EOP-107-2, Alternate RPV Pressure Control
31EO-EOP-010-2, RPV Control (non-ATWS) flowchart
T23-PC-LP-01301, Primary Containment lesson plan

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for RO Final Version 11.26.2007

1- Bold Unit 2
2- Add "total" to loss of vacuum to ensure the applicant knows that vacuum is at 0".
3- Break first paragraph into two sentences with bulleted conditions.

RFA Approved 10/23/2007
BLC updated distractor analysis only 11/19/07

Tier:	2	Group:	1
Keyword:	PCIS	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

19. 223002K3.01 002/2/1/PCIS/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Unit 1 is in Mode 4 with the following conditions:

- "1B" RHR pump is in shutdown cooling
- CRD flow is ~ 60 gpm
- RWCU reject flow is ~ 60 gpm
- RPV level is +36 "

Which ONE of the following identifies how a trip of the "1B" RPS MG set will affect reactor water level and the primary containment isolation system logic? (assume no operator action)

A. Level will remain the same.
Inboard Shutdown Cooling Suction (E11-F009) and LPCI Inboard Injection Valve (E11-F015B) will BOTH auto-close.

B. Level will steadily rise.
ONLY the Inboard Shutdown Cooling Suction (E11-F009) valve will close.
The LPCI Inboard Injection Valve (E11-F015B) will remain open.

C. Level will steadily rise.
Outboard Shutdown Cooling Suction (E11-F008) and LPCI Inboard Injection Valve (E11-F015B) will BOTH auto-close.

D. Level will remain the same.
ONLY the Outboard Shutdown Cooling Suction (E11-F008) valve will close.
The LPCI Inboard Injection Valve (E11-F015B) will remain open.

A. Incorrect because level will immediately begin rising due to CRD flow without RWCU reject flow (RWCU F004 valve will also auto-close). Plausible if applicant does not know that RWCU isolates; i.e., simply classifies as a loss of shutdown cooling.

B. Incorrect because F009 is not affected by trip of 1B RPS MG set and because F015B will auto-close. Plausible if applicant does not know which PCIS valves are triggered by RPS "B."

C. Correct.

D. Incorrect because level will immediately begin rising due to CRD flow without RWCU reject flow (RWCU F004 valve will also auto-close). Also incorrect because F015B also auto-closes. Plausible if applicant does not know that RWCU isolates; i.e., simply classifies as a loss of shutdown cooling and assumes RPS "B" loss does not affect inboard LPCI valve.

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)
K3.01 Reactor water level . . . . . 3.7 / 3.7

References
34AB-C71-002-1, Attachment 3, Loss Of RPS Bus Automatic Actions
E11-RHR-LP-00701, RHR system lesson plan
G31-RWCU-LP-00301, RWCU system lesson plan

1- Bold Unit1, add full MPL #s to valves, bullet conditions.
2- Change "2B" RHR to "1B". Applicant may think Unit 2 "B" RHR, not 1E11-C002B.

RFA Approved 10/23/2007

Tier:	2	Group:	1
Keyword:	PCIS	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

20. 230000A4.03 001/2/2/RHR/NEW/FUND/HT2007-301/RO/BLC/RFA

Both Units are operating at 100% power with RHR in standby.

Which ONE of the following describes how the RHR piping water level is maintained and/or monitored and describes the normal status of the containment spray piping?

A. If the water level in the spray line piping upstream of the containment spray outboard valve (2E11-F016A) drops, then an annunciator will alarm in the control room.

   The section of piping between the 2E11-F016A and the containment spray inboard valve (2E11-F021A), is maintained full of water by the keepfill system.

B. If the water level in the spray line piping upstream of 2E11-F016A drops, then an annunciator will alarm in the control room.

   The section of piping between the 2E11-F016A and 2E11-F021A is **NOT** maintained full of water by the keepfill system.

C. The **Unit 2** keepfill jockey pumps do **NOT** have any auto-start feature.

   The section of piping between the 2E11-F016A and 2E11-F021A is **NOT** maintained full of water by the keepfill system.

D. The **Unit 1** keepfill jockey pumps do **NOT** have any auto-start feature.

   The section of piping between the 1E11-F016A and 1E11-F021A is maintained full of water by the keepfill system.

Note: Hatch drains this section of piping to avoid introducing water into the drywell when the valve stroke operability test is performed. The jockey pump keepfill system maintains the piping upstream of the F016 full; however, the piping section between the F016 and F021 will not be ensured full.

Unit 1: RHR Loop A(B) Jockey Pump System Water Level Low alarm is triggered by a level switch in loop 1 drywell spray line (loop 2 head spray line)
Unit 2: RHR Loop A(B) Jockey Pump System Water Level Low alarm is triggered by a level switch in loop 1 injection line (loop 2 head spray line)

A. Incorrect because the F016/F021 piping is not kept full by the keepfill system. Plausible if applicant thinks that keepfill system maintains all of the ECCS piping full of water.

B. Correct.

C. Incorrect because the Unit 2 jockey pumps do have an auto-start feature on low pressure. Plausible because Unit 1 pumps don't have any auto-start features. Also plausible if applicant thinks that keepfill system maintains all of the ECCS piping full of water.

D. Incorrect because the F016/F021 piping is not kept full by the keepfill system. Plausible if applicant thinks that keepfill system maintains all of the ECCS piping full of water.

RHR/LPCI: Torus/Pool Spray Mode
A4. Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)
A4.03 Keep fill system . . . . . 3.1 / 3.0

References
34SV-E11-002-2, RHR Valve Operability (Section 7.2.1.3) surveillance test
34SV-SUV-016-2, Cold Shutdown Valve Operability (Section 7.2.16) surveillance test
E11-RHR-LP-00701, RHR system lesson plan
E21-CS-LP-00801, Core Spray system lesson plan
34AR-601-326-2, Unit 2 RHR Loop A Jockey Pump Sys Water Level Low annunciator procedure
34AR-601-333-2, Unit 2 Jockey Pump Sys A Disch Press Low annunciator procedure
34AR-601-326-1, Unit 1 RHR Loop A Jockey Pump Sys Water Level Low annunciator procedure
34-AR-601-217-1, Unit 1 RHR Loop B Jockey Pump Sys Water Level Low annunciator procedure.

1- Add "upstream of 2E11-F016 " to describe where the level drop is. The applicant could assume that the question is asking about the level and alarm in the section of piping between the two spray valves.
2- Add bold Unit #s, add Unit designator to all valves, captilize and bold all NOTs

RFA Approved 10/23/2007

QUESTIONS REPORT
for RO Final Version 11.26.2007

Tier:	2	Group:	2
Keyword:	RHR	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

21. 233000G2.4.50 002/2/2/FUEL POOL/NEW/HIGHER/HT2007-301/RO/BLC/RFA

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

- "1A" FPC Heat Exchanger in service
- "1A" FPC Filter Demin in service

The operator then receives the following alarm:

1A FUEL POOL PUMP DISCH PRESS HIGH (654-005)

Local observation indicates that the "1A" Fuel pool cooling pump is in service and its actual discharge pressure is 145 psig.

Which ONE of the following describes the fuel pool cooling pump discharge pressure logic and also identifies the required operator actions in accordance with this annunciator procedure?

A. The pump should have already automatically tripped.
Trip the pump and place RHR in fuel pool cooling assist mode.

B. The pump should have already automatically tripped.
Trip the pump and place "1B" FPC pump and demin in service.

C. The pump discharge pressure is still below the automatic trip setpoint.
Remove the "1A" demin from service.

D. The pump discharge pressure is still below the automatic trip setpoint.
Throttle open the 1G41-F010A, Filter Demin Bypass Valve.

Note: On Unit 1, the alarm setpoint is 140 psig. The pump trip setpoint is also 140 psig.

A. Incorrect because the alarm procedure does not direct placing RHR in service. Plausible since RHR can operate in this mode during shutdown cooling operations.

B. Correct.

C. Incorrect because pump should have already tripped. Plausible if applicant does not remember alarm and trip setpoint are the same. Also plausible since removing the "1A" demin is an action listed in the annunciator procedure.

D. Incorrect because pump should have already tripped. Plausible if applicant does not remember alarm and trip setpoint are the same. Also plausible because opening this valve would lower discharge pressure and opening valves is a listed operator action in the annunciator procedure.

QUESTIONS REPORT
for RO Final Version 11.26.2007

SYSTEM: 233000 Fuel Pool Cooling and Clean-up
2.4.50 **Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.**
(CFR: 45.3) IMPORTANCE RO 3.3 / SRO 3.3

References
G41-FPC-LP-04501, Fuel Pool Cooling and Cleanup lesson plan
34AR-654-038-1, 1B Fuel Pool Pump Disch Press Low
34SO-G41-003-1, Fuel Pool Cooling and Cleanup System

1- Incorrect answer. The 1G41-F035 is closed under clearance prior to removing gates. This is the isolation valve to the instrument that causes the alarm. The alarm is NOT illuminated during an outage.
2- Due to the indepth, specific knowledge of method for this valve line-up (clearance), it is beyond expectations for an operator to indentify the correct answer from memory.
3- K/A is for Fuel Pool Cooling and Cleanup system. Question was about Fuel Pool Gate Seals during an Outage. Wrote substitute question that more closely matches the K/A. See new question.

RFA Approved 10/23/2007

BLC re-wrote substitute question because the stem was confusing in that it stated that discharge pressure was 145 psig with pump tripped. Also updated distractor analysis. 11/24/07

Tier:	2	Group:	2
Keyword:	FUEL POOL	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

22. 239002G2.4.22 001/2/1/SRV/NEW/FUND/HT2007-301/RO/BLC/RFA

While performing the 31EO-EOP-010-2, RPV Control (Non-ATWS) the following step is encountered:

IF ANY SRV is cycling on its relief setpoint
THEN manually open SRVs UNTIL reactor pressure is below 960 psig use sequence listed in Table 1

Which ONE of the following interprets the phrase "cycling on its relief setpoint" and is one of the bases for this EOP step?

A. "Cycling" means repetitive SRV actuations on the electrical overpressure setpoint.

The Table 1 opening sequence is required to evenly distribute cycles on the SRVs and to prevent localized heating in the torus.

B. "Cycling" means repetitive SRV actuations on the electrical overpressure setpoint.

Pressure is stabilized at a value below the high RPV pressure scram setpoint to permit the scram logic to be reset.

C. "Cycling" means repetitive SRV actuations due to Low Low Set.

The Table 1 opening sequence is required to evenly distribute cycles on the SRVs and to prevent localized heating in the torus.

D. "Cycling" means repetitive SRV actuations due to Low Low Set.

Pressure is stabilized at a value below the high RPV pressure scram setpoint to permit the scram logic to be reset.

A. Correct

B. Incorrect because the EOP basis for stabilizing pressure below 960 psig is to ensure that steam flow through the main turbine bypass valves is at 100% of bypass valve capacity. Plausible because the EOP basis for the next step in the flowchart (stabilizing pressure below 1074 psig) is to permit resetting the scram logic.

C. Incorrect because low low set actuation is NOT considered "cycling". Plausible if applicant knows that low low set actuation causes SRV periodic cycling.

D. Incorrect because low low set actuation is NOT considered "cycling". Plausible because the EOP basis for the next step in the flowchart (stabilizing pressure below 1074 psig) is to permit resetting the scram logic.

SYSTEM: 239002 Relief/Safety Valves
2.4.22 **Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.**
(CFR: 43.5 / 45.12) IMPORTANCE RO 3.0 / SRO 4.0

References
31EO-EOP-010-2, RPV Control (Non-ATWS)
EOP-RC-LP-20302, RPV Control (Non-ATWS) lesson plan

1- Change Low Level Set to Low Low Set
2- Change backup electrical relief setpoint to electrical overpressure setpoint.

RFA Approved 10/23/2007
BLC updated distractor analysis only 11/19/07

Tier:	2	Group:	1
Keyword:	SRV	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

23. 245000K3.05 001/2/2/FEEDPUMP/NEW/FUND/HT2007-301/RO/BLC/RFA

Unit 2 turbine generator is operating at 85% when the "D" moisture separator hotwell drain tank becomes full of water. The "D" MSR's downcomer is full to the bottom of the moisture separator shell.

Which ONE of the following predicts the effect of this condition on the reactor feedpumps steam inlet control valves?

A. The HP control valve travels from full closed to open.

B. The LP control valve travels from full closed to open.

C. The HP control valve closes.

D. The LP control valve closes.

Updated 11/27/07 BLC/ RSG

A. Correct.

B. Incorrect because the LP control valve is already open as low pressure steam (from crossover piping) diminshes. Plausible if applicant is not sure of the source and pressure of the normal steam supply for the feedpumps.

C. Incorrect because the turbine will trip on high moisture separator level which causes the HP control valve to open. Plausible if applicant is not sure of the source and pressure of the normal steam supply for the feedpumps.

D. Incorrect because the turbine will trip on high moisture separator level which causes the LP control valve to fully open before the HP control valve opens. Plausible if applicant is not sure of the source and pressure of the normal steam supply for the feedpumps.

K3. Knowledge of the effect that a loss or malfunction of the MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS will have on following: (CFR: 41.7 / 45.4)
K3.05 Reactor feedwater pump: Plant-Specific . . . . . 2.7 / 2.8

References
N21-CNDFW-LP-00201, Condensate & Feedwater lesson plan
N22-MSRFW-LP-01501, Moisture Separator Reheaters & Feedwater Heaters lesson plan
N30-MTA-LP-01701, Main Turbine Lesson plan
B21-SLLS-LP-01401, Main Steam & Low Low Set lesson plan

1- Bold Unit 2

RFA Approved 10/23/2007

QUESTIONS REPORT

for RO Final Version 11.26.2007

Tier:	2	Group:	2
Keyword:	FEEDPUMP	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

24. 259001K3.08 001/2/2/RCIC/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Unit 2 is operating at 100% power with all systems normally aligned. The RCIC Pump Operability, 34SV-E51-002-2, is being performed. The operator placed the TEST switch to the START position to commence the RCIC surveillance test and now RCIC is running with the flow controller in AUTOMATIC and its flowpath aligned to the CST.

While RCIC is running, both reactor feed pumps trip and RPV level drops to -45 inches.

Assuming no operator actions, which ONE of the following predicts the plant response?

A. Both of the FW Line Flow indicators 2C32-R604A/B at panel 2H11-P603 will be indicating injection flow; however, the amounts will be different. RCIC and HPCI will both be injecting.

B. The "A" FW Line Flow indicator 2C32-R604A at panel 2H11-P603 will be indicating HPCI injection flow. RCIC does NOT inject.

C. Both of the FW Line Flow indicators 2C32-R604A/B at panel 2H11-P603 will be indicating zero injection flow. RCIC and HPCI will both be injecting.

D. The "B" FW Line Flow indicator 2C32-R604B at panel 2H11-P603 will be indicating HPCI injection flow. RCIC does NOT inject.

Note: On Unit 2, HPCI injects to "A" FW line. On Unit 2, RCIC injects to "B" FW line. (These are reversed on Unit 1) However, these injection points are downstream of the flow instrumentation.

A. Incorrect because HPCI and RCIC both tap into FW lines DOWNSTREAM of flow indictors. Plausible if applicant thinks that these systems tap into the FW lines upstream of the flow instrumentation.

B. Incorrect because HPCI discharges in downstream of flow detector. Also incorrect because RCIC will be automatically removed from test, allowing E51-F013 to open. Plausible if applicant knows that HPCI injects into "A" FW line (only on U2) and thinks that the E51-F013 test feature remains in effect.

C. Correct.

D. Incorrect because HPCI taps into FW line "A" on Unit 2 ("B" on Unit 1) DOWNSTREAM of the flow detector. Also incorrect because RCIC will be automatically removed from test, allowing E51-F013 to open. Plausible because HPCI injects to "B" line on Unit 1. Also plausible if applicant thinks that the E51-F013 test feature remains in effect.

K3. Knowledge of the effect that a loss or malfunction of the REACTOR FEEDWATER SYSTEM will have on following: (CFR: 41.7 / 45.4)
K3.08 RCIC . . . . . 2.9 / 2.9

References
E51-RCIC-LP-03901, RCIC system lesson plan
N21-CNDFW-LP-00201, Cond & FW system lesson plan
34SV-E51-002-2, RCIC Pump Operability surveillance test

1- Change Level 2 to -45 inches to allow time for the Systems to align to provide the possible indications in the distractors.

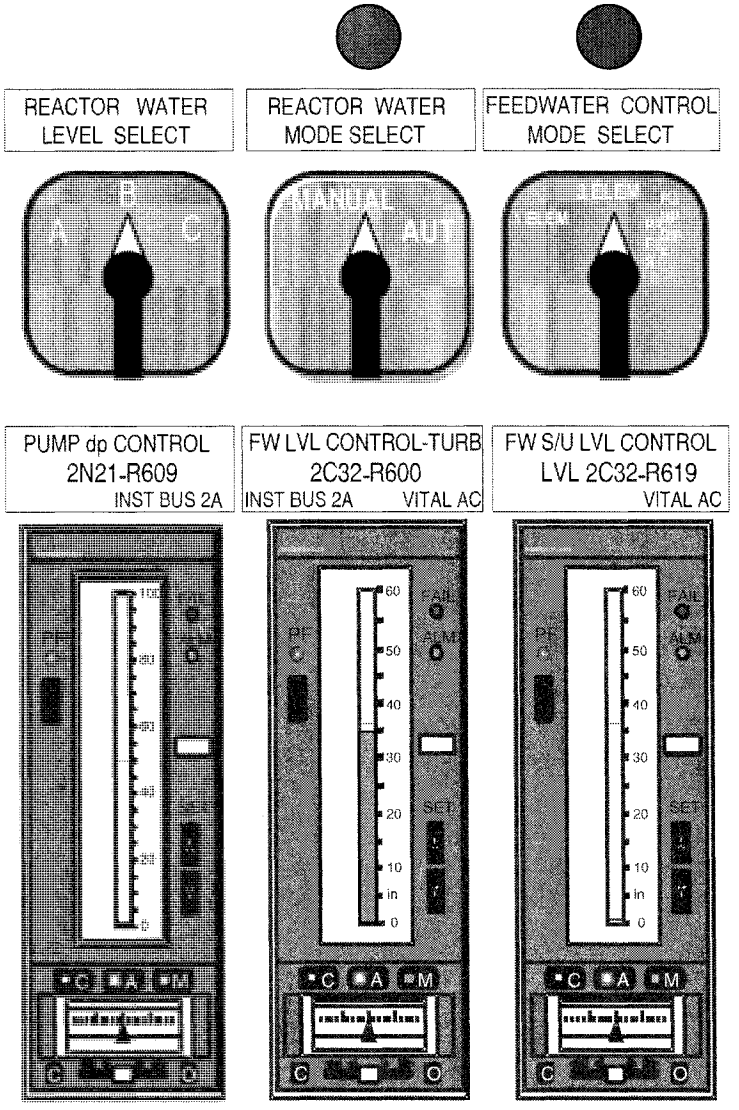
RFA Approved 10/23/2007
BLC updated distractor analysis only 11/19/07

Tier:	2	Group:	2
Keyword:	RCIC	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

25. 259002K4.10 001/2/1/FWLC/BANK MOD/HIGHER/HT2007-301/RO/BLC/RFA

The **Unit 2** Feedwater Level Control System is aligned as follows:

(Note: The lights above each SELECT Switch is extinguished.)



Given this switch alignment, which ONE of the following choices identifies the primary input level signal and how reactor water level will be affected if the manual output lever on the bottom of the Reactor Feedpump Turbine Master Controller (2C32-R600) is held in the "O" (open) position?

(NOTE: The Green "A" light on each controller is illuminated.)

25. 259002K4.10 001/2/1/FWLC/BANK MOD/HIGHER/HT2007-301/RO/BLC/RFA

A. C32-K648, median level signal processor.
Level will rise.

B. Directly from the C32-N004B level transmitter signal.
Level will remain the same.

C. C32-K648, median level signal processor.
Level will remain the same.

D. Directly from the C32-N004B level transmitter signal.
Level will rise.

Note: All controllers in AUTO.

A. Incorrect because with the mode select switch in the MANUAL position, the system uses the reactor water level select switch position (N004B). Also incorrect because the RFPT controller is in AUTO and the lever will not work. Plausible if applicant does not know the normal and alternate level signals.

B. Correct.

C. Incorrect because with the mode select switch in the MANUAL position, the system uses the reactor water level select switch position (N004B). Plausible if applicant does not know the normal and alternate level signals.

D. Incorrect because the RFPT controller is in AUTO and the lever will not work. Plausible because it is correct.

This was a KA change from:

K4. Knowledge of REACTOR WATER LEVEL CONTROL SYSTEM design feature(s) and/or interlocks which provide for the following: (CFR: 41.7)
K4.02 Bypassing of the RWM: Plant-Specific . . . . . 2.8 / 3.0

TO

K4. Knowledge of REACTOR WATER LEVEL CONTROL SYSTEM design feature(s) and/or interlocks which provide for the following: (CFR: 41.7)
K4.10 Three element control (main steam flow, reactor feedwater flow & reactor water level provide input) 3.4 / 3.4

BECAUSE

The Rod Worth Minimizer at Hatch does not utilize feedwater level control steam flow/ feed flow as an indication of reactor power (as some other boilers); instead, Hatch RWM uses APRM power. This KA substitution was randomly selected.

References
LOR Exam Bank item #: LR-LP-75071/ LC-75051.002
C32-RWLC-LP-00202

1- Add (Note: The lights above each SELECT Switch is extinguished.)
2- Add (NOTE: The Green "A" light on each controller is illuminated.)
3- Change light color above Reactor Water Mode Select switch to match other select switch light.
4- Updated Plausibility

RFA Approved 10/23/2007

Tier:	2	Group:	1
Keyword:	FWLC	Source:	BANK MOD
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

26. 259002K6.01 001/2/1/AIR/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Unit 2 is operating at 70% power with the following feedwater control alignment:

- Reactor water level select switch: "B"
- Reactor water mode select switch: AUTO
- Feedwater control mode select switch: 3 element
- FW level control turb 2C32-R600: AUTO

Given this alignment, which ONE of the following describes how a loss of instrument air to the condensate and feedwater system will affect the reactor water level control system? (assume that a reactor scram does not occur and is not required.)

A. REACTOR LEVEL CONTROL VALVE LOCKED will alarm
Reactor Feedwater Pumps 2A and 2B speed will increase due to system minimum flow valves failing open.

B. REACTOR LEVEL CONTROL VALVE LOCKED will NOT alarm
Reactor Feedwater Pumps 2A and 2B speed will remain the same with no minimum flow valve protection.

C. REACTOR LEVEL CONTROL VALVE LOCKED will alarm
Reactor Feedwater Pumps 2A and 2B speed will remain the same with no minimum flow valve protection.

D. REACTOR LEVEL CONTROL VALVE LOCKED will NOT alarm.
Reactor Feedwater Pumps 2A and 2B speed will increase due to system minimum flow valves failing open.

Note: Condensate, Condensate Booster, and Reactor Feed Pump min flow valves fail OPEN as air pressure is reduced. The control valve locked alarm comes in at 50 psig.

A. Correct.

B. Incorrect because the locked alarm only comes in when air pressure lowers to 50 psig. Plausible if applicant thinks this alarm in only armed when the startup level control valve is being used for plant operations.

C. Incorrect because the feedpump speeds will rise when the min flow valves fail open, i.e., in order to maintain RPV level constant, the feedpumps will speed up to compensate for the min flow valve diverting water to the main condenser. Plausible if the applicant thinks that the min flow valves fail closed.

D. Incorrect because the locked alarm only comes in when air pressure lowers to 50 psig. Plausible if applicant thinks this alarm in only armed when the startup level control valve is being used for plant operations.

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)
K6.01 Plant air systems ..... 3.2 / 3.2

References
34AR-603-116-1/123-2, Reactor Level Control Valve Locked annunciator procedure
34AR-603-132-2, Feedwater Control System Trouble annunciator procedure
34AB-P51-001-2, Loss of Air Abnormal procedure

1- Bold Unit 2, bullet conditions
2- . Delete "FEEDWATER CONTROL SYSTEM TROUBLE" really has nothing to do with loss of air. To more closely match KA, Add to each distractor "Reactor Feedwater Pumps 2A and 2B speed will" (A & D) increase (B & C) remain the same "due to system minimum flow valves failing open (closed)".
. Add to plausibility statement for B-D "Also plausible if applicant does not know the effect of loss of air to the condnesate and condensate booster pumps min flow valves and the effect on the feedwater pump."
3- Add to references - 34AB-P51-001-2, Loss of Air Abnormal procedure

RFA Approved 10/23/2007
BLC updated distractor analysis only 11/19/07

Tier:	2	Group:	1
Keyword:	AIR	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

27. 261000A1.05 002/2/1/SBGT/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Unit 2 is starting up with Primary Containment Inerting in progress per 34SO-T48-002-2, Containment Atmospheric Control and Dilution Systems.

Which ONE of the following describes the SBGT lineup and also identifies when inerting should be stopped in accordance with this procedure?

A. SBGT is running with a suction ONLY from the Drywell.

   Inerting should be stopped when Oxygen levels decrease to a minimum of 3.5%.

B. SBGT is running with a suction ONLY from the Torus.

   Inerting should be stopped when Oxygen levels decrease to a minimum of 5%.

C. SBGT is running with a suction from the Drywell AND either the Refuel Floor OR Reactor Building.

   Inerting should be stopped when Oxygen levels decrease to a minimum of 3.5%.

D. SBGT is running with a suction from the Torus AND either the Refuel Floor OR Reactor Building.

   Inerting should be stopped when Oxygen levels decrease to a minimum of 5%.

A. Incorrect because SBGT suction is aligned to either the refuel floor or reactor building. Plausible since drywell is being inerted and procedure lines up drywell to SBGT. (part of suction path).

B. Incorrect because SBGT suction is aligned to either the refuel floor or reactor building. Plausible since applicant may reason that torus is safer way to inert because of scrubbing action of the water.

C. Correct.

D. Incorrect because the procedure requires inerting until less than 3.5%. Plausible because this is 1% above the tech spec limit.

A1. Ability to predict and/or monitor changes in parameters associated with operating the STANDBY GAS TREATMENT SYSTEM controls including: (CFR: 41.5 / 45.5)
A1.05 Primary containment oxygen level: Mark-I&II . . . . . 2.7* / 2.9*

References
31EO-EOP-104-2, Primary Containment Venting For Hydrogen & Oxygen Control
34SO-T46-001-2, Standby Gas Treatment System operating procedure
EOP-104-20315, EOP 104: PRIMARY CONTAINMENT VENTING FOR HYDROGEN CONTROL

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1- The level of detail of the EOP flowcharts in original question is typically reserved for SROs, modified Stem and distractors for Normal Inerting. Kept same question structure and most of first half of each distractor. Added Percent O2 concentration requirement requiring applicant to know Tech Spec limit for O2.

RFA Approved 10/23/2007
BLC updated distractor analysis only 11/19/07

Tier:	2	Group:	1
Keyword:	SBGT	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

28. 262001A2.03 001/2/1/AC-DC/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Both units were operating at 100% power with all systems normally aligned when a tornado damages the switchyard and ALL offsite power is lost to both units.

Neither unit currently has a LOCA signal present.

Which ONE of the following describes how the AC electrical distribution will be affected and identifies an appropriate procedure(s) to implement in conjunction with the EOPs?

A. Busses 2E and 2G will be energized
Bus 2F will be DE-ENERGIZED
Enter 34AB-R22-002-1/2, Loss of 4160V Emergency Bus on both units

B. Busses 1E and 1G will be energized
Bus 1F will be DE-ENERGIZED
Enter 34AB-R22-002-1, Loss of 4160V Emergency Bus ONLY on Unit 1

C. Busses 2E, 2F, and 2G will all be energized
Enter 34AB-R22-004-1/2, Loss of 4160V Bus A, B, C, or D on both units

D. Busses 1E, 1F, and 1G will all be energized
Enter 34AB-R22-004-2, Loss of 4160V Bus A, B, C, or D ONLY on Unit 2

The swing diesel is normally aligned to Unit 1.

A. Correct.

B. Incorrect because 1F will be energized from the swing diesel. Plausible if applicant does not know that the swing diesel is normally aligned to unit 1.

C. Incorrect because 2F will be dead. Plausible if applicant does not know that the swing diesel is normally aligned to unit 1.

D. Incorrect because this is not a station blackout even though all plant BOP busses are dead. Plausible if applicant thinks that a total loss of all offsite power (both units) is the same as a station blackout.

A2. Ability to (a) predict the impacts of the following on the A.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)
A2.03 Loss of off-site power . . . . . 3.9 / 4.3*

References
Plant electrical distribution diagram
34SV-R43-002-2, Diesel Generator 1B Monthly Test
R43-EDG-LP-02801, Emergency Diesel Generators lesson plan

QUESTIONS REPORT
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1- Whether or not a LOCA signal has been received on one or both units would change the correct answer to this question; therefore, added the following statement "Neither unit currently has a LOCA signal present" to the stem of the question in order to clarify this point.
2- Cap Only in C and D

RFA Approved 10/23/2007

Tier:	2	Group:	1
Keyword:	AC-DC	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

29. 262002K3.15 001/2/1/DEHC/NEW/FUND/HT2007-301/RO/BLC/RFA

Unit 2 is operating at 100% power when a loss of Vital AC 2R25-S063 occurs.

Which ONE of the following describes how this power loss affects the Main Turbine?

A. The turbine will NOT trip. All the Mark VI human machine interface (HMI) screens in the control room will lose power.

B. The turbine WILL trip because two EHC processors in the packaged electrical & electronic control compartment (PEECC) and two pressure transmitters will lose power.

C. The turbine WILL trip because the power to the turbine trip relays will be lost.

D. The turbine will NOT trip. The main turbine thrust bearing wear detector and vibration detection will be lost.

A. Correct.

B. Incorrect because the alternate power is still available (R25-S024). Plausible since the loss of two processors and two transmitters will result in a turbine trip.

C. Incorrect because the turbine trip relays are 125VDC powered to trip. Plausible if applicant thinks these relays are normally energized AC.

D. Incorrect because this turbine instrumentation is 125VDC. Plausible if applicant thinks that this turbine supervisory instrumentation is powered from vital AC.

K3. Knowledge of the effect that a loss or malfunction of the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) will have on following: (CFR: 41.7 / 45.4)
K3.15 Main turbine operation: Plant-Specific . . . . . 2.6 / 2.7

References
LR-LP-75227-00, UNIT 1 2006 PLANT MODIFICATIONS
34AB-R25-001-2, LOSS OF VITAL AC BUS
N30-MTA-LP-01701, Main Turbine lesson plan

1- Editorial changes: Made **Unit 2** bold. Placed a space between two sentences of the stem. Capitalized Main Turbine. Added "Mark VI" in fron of HMI

RFA Approved 10/23/2007

Tier:	2	Group:	1
Keyword:	DEHC	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

30. 263000G2.1.29 003/2/1/DC LINEUP/NEW/FUND/HT2007-301/RO/BLC/RFA

After a system outage, tagout removal on the Unit 1 HPCI system is being performed to restore HPCI with the plant operating at 100% power.

The breaker for the Lube Oil Cooling Wtr Valve 1E41-F059 must be manipulated to the closed position during the performance of the tagout removal.

Which ONE of the following describes the required verification activities, if any, which must be completed before the system can be considered operable in accordance with NMP-OS-002, Verification Policy?

A. No verification by a second person is required.

B. Only a peer check is required and no documentation of this peer check is required.

C. Only concurrent verification is required and this must be documented.

D. Only Independent verification is required and this must be documented.

Note: Step 6.1.7 for restoration of systems states that systems should not

A is plausible if component does not have to be manipulated, i.e., already closed.

A. Correct iaw step 6.1.1.A of NMP-OS-002

B. Incorrect because IV is required. Plausible if applicant does not know requirement for IV for restoration of safety system component or does not consider if system is safety system.

C. Incorrect because IV is required. Plausible if applicant believes that CV is adequate. Also plausible if applicant does not know requirement for IV for restoration of safety system component or does not consider if system is safety system.

D. Incorrect because IV is required and requirements are not met for use of alternate indications. Also incorrect because IV does not allow same person to verify. .

SYSTEM: 263000 D.C. Electrical Distribution
2.1.29 **Knowledge of how to conduct and verify valve lineups.** (CFR: 41.10 / 45.1 / 45.12)
IMPORTANCE RO 3.4 / SRO 3.3

References
NMP-OS-002, Verification Policy
10AC-MGR-019-0, Procedure Use and Adherence administrative procedure

QUESTIONS REPORT
for RO Final Version 11.26.2007

1- Add "for this breaker during performance of the electrical lineup". Makes statement specific for this case, not just the definition of independent verification.
2- To bullet proof - Add "There is no allowance for waiving this requirement for this line-up." to A and C. (The SS can require independent verification if desired.)
3- Added to plausibility statement "and knows that independent verification is required if manipulation is involved on a safety system, or at SS request."
4- Added Verification is required or Not required to beginning of each statement to answer question asked in the stem.

RFA Approved 10/23/2007
BLC re-wrote question w/ licensee concurrence to remove ambiguity because of Ops shift flexibility to determine verification req'ts on a case-by-case basis for lineups.
Re-wrote question to test specific case of clearance removal on a safety related tech spec system verification req'ts on a DC breaker. 11/20/07

Tier:	2	Group:	1
Keyword:	DC LINEUP	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

31. 264000A4.05 001/2/1/DIESEL/NEW/HIGHER/HT2007-301/RO/BLC/RFA

A loss of offsite power occurred on **Unit 2.** The following conditions currently exist:

- Diesel Generator 2A is loaded to 300 Kw
- Offsite power has been re-established via SAT 2C
- The control room operator is in the process of transferring power from the diesel to the alternate power supply

Which ONE of the following identifies the syncroscope direction and switch position required to parallel and realign bus 2E to its alternate power supply?

A. Clockwise

Diesel generator test switch is required to be placed in the TEST position.

B. Clockwise

Diesel generator 2A test SAT 2C out of service interlock switch is required to be placed in the TEST position.

C. Counter-clockwise

Diesel generator test switch is required to be placed in the TEST position.

D. Counter-clockwise

Diesel generator 2A test SAT 2C out of service interlock switch is required to be placed in the TEST position.

A. Correct.

B. Incorrect because the load is > 500 kw; therefore, the syncscope must be rotating in the clockwise direction to prevent the diesel from picking up additional load which may overload the diesel. Also incorrect because the SAT 2C out of service (oos) test switch is only used when only SAT 2D is available; i.e., SAT 2C is de-energized. Plausible if applicant knows that clockwise is correct direction and does not know the purpose of the 2C oos test switch: to allow paralleling when SAT 2C is dead.

C. Incorrect because syncsope should be rotating in the counter-clockwise direction when load is > 500 kw. Plausible if applicant knows that the counterclockwise direction is required when <500 kw.

D. Incorrect because syncsope should be rotating in the counter-clockwise direction when load is > 500 kw. Also incorrect because the SAT 2C out of service (oos) test switch is only used when only SAT 2D is available; i.e., SAT 2C is de-energized. Plausible if applicant does not know the purpose of the 2C oos test switch: to allow paralleling when SAT 2C is dead.

A4. Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)
A4.05 Transfer of emergency generator (with load) to grid . . . . . 3.6 / 3.7

References
34SO-R43-001-2, Diesel Generator Standby AC System operating procedure (Section 7.3.1)
R43-EDG-LP-02801, Emergency Diesel Generators lesson plan

1- Editorial change: Made **Unit 2** bold and placed bullets in front of plant conditions.
2- SAT 2C is the Alternate supply to the Emergency buses. Changed the word "normal" to "alternate" when referring to transferring the bus to SAT C.

RFA Approved 10/23/2007

Tier:	2	Group:	1
Keyword:	DIESEL	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

32. 264000K3.01 001/2/1/DIESEL/NEW/HIGHER/HT2007-301/RO/BLC/RFA

A leak in the drywell has occurred on **Unit 2** and the following conditions currently exist:

- Reactor pressure 650 psig and slowly lowering
- Reactor level -45" and rising
- Drywell pressure is 1.9 psig and steady
- Diesel 1B is unavailable

Which ONE of the following is the current status of the 2C RHR Pump and also predicts how this pump will be affected if a loss of offsite power subsequently occurs on **Unit 2**?

Before the LOSP, RHR Pump 2C _____ running.
After the LOSP, RHR Pump 2C _____.

A. is / will trip and re-start 22 seconds after the loss of offsite power.

B. is NOT / will NOT be running after the loss of offsite power.

C. is NOT / will auto-start 12 seconds after the loss of offsite power.

D. is / will NOT be running after the loss of offsite power.

Swing diesel 1B is unavailable; therefore Emergency Bus 2F will not have power following the loss of offsite power. Normal starting time for diesel is 12 seconds.

A. Incorrect because the 2F Emergency bus will be dead since the swing diesel is unavailable. Plausible if the applicant does not know the power supply to the 2C RHR. Also plausible because RHR pumps 2A, 2B, and 2D all start at 22 seconds after the loss of offsite power.

B. Incorrect because the 2C RHR pump is initially running due to the DW pressure being greater than 1.85 psig. Plausible if applicant does not know the LOCA signal includes level OR drywell pressure, or does not know the setpoint.

C. Incorrect because the RHR pumps are running due to a LOCA signal. Also incorrect because the RHR pump will not have power following the loss of offsite power because the swing diesel is unavailable. Plausible if applicant does not know the LOCA signal includes level OR drywell pressure, or does not know the setpoint. Also plausible because the normal diesel starting time is 12 seconds and RHR 2C starting occurs immediately after 12 seconds during normal loss of offsite power sequencing.

D. Correct.

K3. Knowledge of the effect that a loss or malfunction of the EMERGENCY GENERATORS (DIESEL/JET) will have on following: (CFR: 41.7 / 45.4)
K3.01 Emergency core cooling systems 4.2* / 4.4*

References
E11-RHR-LP-00701, RHR lesson plan
R43-EDG-LP-02801, Emergency Diesel Generator lesson plan

1- Editorial: Made **Unit 2** bold, added bullets to the plant parameters

RFA Approved 10/23/2007

Tier:	2	Group:	1
Keyword:	DIESEL	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

33. 271000K5.06 001/2/2/OFFGAS/NEW/FUND/HT2007-301/RO/BLC/RFA

Unit 1 is operating at 100% power. Which ONE of the following identifies the normal temperature of the in-service offgas catalytic recombiner, including the operational implication of catalytic recombination in the offgas system?

A. Normally ~ 800 degrees
Recombiner temperature is NOT dependent on the reactor power level.

B. Normally ~ 800 degrees
Recombiner temperature is dependent on the reactor power level.

C. Normally ~ 300 degrees
Recombiner temperature is dependent on the reactor power level.

D. Normally ~ 300 degrees
Recombiner temperature is NOT dependent on the reactor power level.

A. Incorrect because bed temperature is directly proportional to the power level. Plausible if applicant knows normal temperature but does not understand the basis for catalyst bed temperature trend during startups/shutdowns.

B. Correct.

C. Incorrect because this is the preheater outlet (i.e., recombiner inlet) normal temperature (vs the recombiner bed temperature). Plausible if applicant knows preheater temperature or the standby bed temperature.

D. Incorrect because this is the preheater outlet (i.e., recombiner inlet) normal temperature (vs the recombiner bed temperature). Also incorrect because bed temperature is directly proportional to the power level. Plausible if applicant knows preheater temperature or the standby bed temperature....but does not understand the basis for catalyst bed temperature trend during startups/shutdowns.

K5. Knowledge of the operational implications of the following concepts as they apply to OFFGAS SYSTEM:
(CFR: 41.7 / 45.4) K5.06 Catalytic recombination . . . . . 2.7 / 2.7

References
34AR-N62-001-1, Recombiner A/B Temp High/Low annunciator procedure
34AR-N62-019-1, Recombiner B Inlet Temp Low annunciator procedure
34AR-N62-001-2S, Failure of Recombiner & Ctl of Sustained Combustion in the OG system AOP
N62-OG-LP-03101, Offgas system lesson plan
OPL171.030, Offgas lesson plan (Browns Ferry)
SD-30, Offgas system description (Brunswick)

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1- Editorial: Placed line returns on answer options for readibility by students.
2- To bullet proof add "at 100% reactor power" to each distractor. (At very low pwer levels, because the temp is power dependent, the temp is much closer to 300 than 800 degrees.)

RFA Approved 10/23/2007

Tier:	2	Group:	2
Keyword:	OFFGAS	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

34. 272000G2.2.30 001/2/2/RAD MON/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Core alterations are in progress on **Unit 2.**

A fuel bundle is being moved from the spent fuel pool to the vessel core through the transfer canal.

The following control room annunciator is received:

REFUELING FLOOR AREA RADIATION HIGH (601-312-2)

The operator subsequently observes the following at the panel 2D21-P600:

	RED LIGHT	READING
• Reactor head laydown area (2D21-K601A)	ON	25mR/hr
• Dryer separator pool (2D21-K601E)	OFF	40 mR/hr
• Spent fuel pool & new storage (2D21-K601M)	OFF	10 mR/hr
• Reactor vessel refueling floor (2D21-K611K)	OFF	10mR/hr
• Reactor vessel refueling floor (2D21-K611L)	OFF	10mR/hr

Given these conditions, which ONE of the following describes the Main Control Room Environmental Control (MCREC) System response and required actions in accordance with 34FH-OPS-001-0, Fuel Movement Operation?

A. MCREC remains running in its normal mode
The bundle is required to be lowered into either the reactor vessel OR the fuel pool until an investigation is completed.

B. MCREC shifts to the pressurization mode
The bundle is required to be lowered into either the reactor vessel OR the fuel pool until an investigation is completed.

C. MCREC remains running in its normal mode
The bundle is required to be lowered back into the fuel pool ONLY, until an investigation is completed.

D. MCREC shifts to the pressurization mode
The bundle is required to be lowered back into the fuel pool ONLY, until an investigation is completed.

Note: 34FH-OPS-001-0, P&L 5.1.3 and 5.2.9

A. Incorrect because the MCREC will auto-start on either K601A OR K601M upscale. Plausible if applicant thinks this rad alarm is associated with the ventilation system rad monitors or does not know the auto-start setpoint.

B. Correct.

C. Incorrect because the MCREC will auto-start on either K601A OR K601M upscale. Also incorrect because the fuel handling procedure precautions/limitations require the load to be lowered in either the pool or the core to provide additional shielding until an investigation is completed. Plausible if applicant does not know the auto-start signals for MCREC and/or does not know the fuel handling procedure precaution/limitation.

D. Incorrect because the fuel handling procedure precautions/limitations require the load to be lowered in either the pool or the core to provide additional shielding until an investigation is completed. Plausible if the applicant does not know the fuel handling procedure precautions/limitations.

SYSTEM: 272000 Radiation Monitoring System
2.2.30 **Knowledge of RO duties in the control room during fuel handling such as alarms from fuel handling area / communication with fuel storage facility / systems operated from the control room in support of fueling operations / and supporting instrumentation.** (CFR: 45.12) IMPORTANCE RO 3.5 / SRO 3.3

References
34FH-OPS-001-0, Fuel Movement Operation, Precaution/Limitation 5.1.3 & 5.2.9
34AR-601-312-2, Refueling Floor Area Radiation High annunciator procedure
Z41-MCRECS-LP-03701, Main Control Room Environmental Control System lesson plan
D11-PRM-LP-10007, Process Radiation Monitors lesson plan
34SV-SUV-019-2, Surveillance Checks (page 23 of 63)
34AB-T22-003-2, Secondary Containment Control AOP

1- Editorial: Made **Unit 2** bold. Added line return following first sentence. Added bullets to rad monitors
2- Changed "core" to "reactor vessel". (A-D) (The bundle can only be placed in its proper in-core location.) Makes "D" hard to defend.
3- all caps "ONLY" (C & D)

RFA Approved 10/23/2007

Tier:	2	Group:	2
Keyword:	RAD MON	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

35. 288000K1.03 001/2/2/SBGT/BANK-MODIFIED/FUND/HT2007-301/RO/BLC/RFA

While transferring RWCU spent resin, the **Unit 2** reactor building ventilation activity level rises such that the 2D11-K609 A thru D (Reactor Bldg Potential Contaminated Area Ventilation Exhaust Rad Monitor) read 25-30 mR/hr.

Which ONE of the following identifies the current status of Unit 1 and 2 Standby Gas Treatment Fans?

	UNIT ONE		UNIT TWO	
	SBGT Fans	Suction Aligned to	SBGT Fans	Suction Aligned to
A.	Both OFF	isolated	Both ON	Refuel & Rx Bldg
B.	Both ON	Rx Bldg only	Both ON	Rx Bldg only
C.	1 ON 1 OFF	Rx Bldg only	1 ON 1 OFF	Rx Bldg only
D.	Both ON	Refuel & Rx Bldg	Both ON	Refuel & Rx Bldg

A. Incorrect because unit 1's fans auto-start too (total of 4 fans running). Also incorrect because unit 1's suction point is refuel & reactor building. Plausible if applicant knows the normal standby alignment is suction source isolated but doesn't know that both units are affected even though the signal originates only from unit 2.

B. Incorrect because both unit's will draw on the refuel floor also. Plausible if applicant knows that both units are affected, but does not know the suction point.

C. Incorrect because both fans normally aligned for auto-start. Also incorrect because fans suction will be aligned to both refuel and reactor building. Plausible if applicant thinks one fan is normally in standby and if applicant does not know the suction point.

D. Correct.

K1. Knowledge of the physical connections and/or cause effect relationships between PLANT VENTILATION SYSTEMS and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8)
K1.03 Standby gas treatment ..... 3.7 / 3.7

References
T46-SBGT-LP-03001, Standby Gas Treatement lesson plan
34SO-T46-001-1/2, SBGT system operating procedure

RFA Approved 10/23/2007

Tier:	2	Group:	2
Keyword:	SBGT	Source:	BANK-MODIFIED
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

36. 290001K1.07 001/2/2/HVAC/NEW/HIGHER/HT2007-301/RO/BLC/RFA

A fuel failure event has occurred on **Unit 1**. The Group 1 isolation logic received an auto-closure signal on low water level; however, F022A and F028A ("A" inboard & outboard) MSIVs failed to close automatically and cannot be manually closed. Additionally, a break exists on "A" main steam line (downstream of the MSIVs) and radioactive steam is leaking into the Turbine Building.

Assuming that the HVAC systems responded as expected, which ONE of the following describes the offsite release that is occurring due to this steam leak into the Turbine Building?

A. Ground level release and is NOT being filtered by the Standby Gas Treatment System

B. Elevated release and is NOT being filtered by the Standby Gas Treatment System

C. Ground level release and is being filtered by the Standby Gas Treatement System

D. Elevated release and is being filtered by the Standby Gas Treatment System

A. Correct.

B. Incorrect because the only release point classified as "elevated" is the main stack. Plausible if applicant knows that the turbine building HVAC is directed to the Rx Bldg Vent Stack Plenum and the applicant thinks that the Rx Bldg stack plenum is considered "elevated."

C. Incorrect because the turbine building HVAC exhaust is not filtered prior to being directed to the reactor building stack plenum. Plausible if the applicant knows the turbine building exhaust is directed to the reactor building stack plenum and assumes that standby gas treatment is running.

D. Incorrect because the only release point considered "elevated" is the main stack. Also incorrect because the turbine building HVAC exhaust is not filtered prior to being directed to the reactor building stack plenum. Plausible if applicant knows that the turbine building HVAC is directed to the Rx Bldg Vent Stack Plenum and the applicant thinks that the Rx Bldg stack plenum is considered "elevated."

K1. Knowledge of the physical connections and/or cause effect relationships between SECONDARY CONTAINMENT and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8)
K1.07 Turbine building ventilation (steam tunnel): Plant- Specific . . . . . 3.0 / 3.1

References
D11-PRM-LP-10007, Process Radiation Monitors
73EP-EIP-018-0, Prompt Offsite Dose Assessment
T41-SC HVAC-LP-01303 Sec Cont Ventilation

QUESTIONS REPORT
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1- Bold Unit 1, Change An to A at beginning of question.
2- Cap first letter of : Group,Turbine Building (2 times)

RFA Approved 10/23/2007

Tier:	2	Group:	2
Keyword:	HVAC	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

37. 295001AK1.01 001/1/1/NATURAL CIRC/NEW/HIGHER/HT2007-301/RO/BLC/RFA

A **Unit 2** startup is in progress in accordance with 34GO-OPS-001-2, Plant Startup.

The following sequence of events occur:

- Both Recirc Pump speeds were raised from minimum speed to 30%
- After the recirc pump speeds were raised, the 2A Recirc MG set tripped.

Five minutes after the MG set trip, the following control panel indications exist:

- Annunciator **"RECIRC LOOP A OUT OF SERVICE"** (602-127) in alarm
- Core Flow Recorder 2B21-R613 7.2 Mlb/hr
- Loop A Jet Pump Flow 2B21-R611A 5.6 Mlb/hr
- Loop B Jet Pump Flow 2B21-R611B 12.8 Mlb/hr

Given these current conditions, which ONE of the following is correct?

A. Core Flow recorder indication is NOT correct.

"A" and "B" jet pump flows should be summed to obtain an accurate core flow rate.

B. Core Flow recorder indication is NOT correct.

"A" jet pump flow must be added to the recorder flow to obtain an actual core flow rate.

C. Core Flow recorder indication is correct.

"A" jet pump flow is being subtracted.

D. Core Flow recorder indication is correct.

"A" jet pump flow is NOT being subtracted.

A. Incorrect. Below 35% pump speed, this flow is positive due to natural circulation. Plausible if applicant is unaware that the MG set field breaker trip causes the subtraction to occur automatically.

B. Incorrect. The flow is forward (not reverse) flow due to natural circulation overcoming the head of the running loop. Plausible because normally at higher pump speeds the reverse flow occurs.

C. Correct. Actual core flow is ~ 18 Mlb/hr.

D. Incorrect. The flow recorder value is providing a misleading LOW core flow indication because the 2A jet pump loop flow is postive (i.e., not reverse)

QUESTIONS REPORT
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AK1 Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION : (CFR: 41.8 to 41.10) AK1.01 Natural circulation (3.5/3.6)

References:
34SO-B31-001-2, Reactor Recirc System, P&L 5.1.5
Annunciator Response 34AR-602-127-2
Study Manual chapter 3, Page 3.17
34SV-SUV-023-2, Jet Pump & Recirc Flow Mismatch Operability

1- Bold Unit 2, bulleted and reformatted to increase readability
2- Change Core Flow to 7.2 instead of 13.3. The recorder should indicate "B" flow minus "A" flow.

RFA Approved 10/23/2007

Tier:	1	Group:	1
Keyword:	NATURAL CIRC	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

38. 295003AA1.04 002/1/1/AC-DC/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Unit 1 is operating at 100% power with all systems in their normal alignment. While the operator was swapping RBCCW pumps, the following alarms were received:

600V BUS 1D BREAKER TRIPPED, 652-318
600V BUS 1D UNDERVOLTAGE, 652-323

The breaker for the faulted pump motor was subsequently disconnected and the 600V bus was re-energized from its normal supply within 10 minutes of the alarm (no other actions have been taken).

Given these plant conditions, which ONE of the following identifies the current status of the 240V DC Vital AC Battery System and the appropriate operator recovery actions?

A. The battery is supplying the vital AC loads.
The battery charger supply breaker can be immediately re-closed.

B. The battery is supplying the vital AC loads.
The non-essential load lockout reset pushbutton must be depressed before re-closing the battery charger supply breaker.

C. The battery is NOT supplying the vital AC loads.
The battery charger supply breaker is tripped and can be immediately re-closed.

D. The battery is NOT supplying the vital AC loads.
The battery charger supply breaker is closed.
The inverter should be transferred back to its normal supply.

A. Incorrect. The non-essential load lockout reset pushbutton must be depressed each time a load breaker is re-closed on the restored 600V AC bus. Plausible if applicant does not know about non-essential load lockout feature.

B. Correct.

C. Incorrect. The battery is supplying the vital AC loads until ~ 2 hours when its voltage decays to ~ 208 volts, then the static switch will transfer to the alternate (Bus 1C) source. Plausible if the applicant thinks the inverter transferred to Bus 1C transformer.

D. Incorrect. same as C, plus the charger supply breaker is indeed tripped. Plausible if applicant thinks the inverter transferred to Bus 1C transformer and does not know abou the non-essential load lockout.

AA1 Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : (CFR: 41.7 / 45.6) AA1.04 D.C. electrical distribution system..... 3.6 / 3.7

References:
R25-ELECT-LP-02705, Vital AC Electrical System Lesson Plan
34AB-R23-001-1, Loss of 600 Volt Emergency Bus
34SO-R23-001-1, Section 7.1.3, Energizing 600V AC Bus 1D from the Normal Supply
R23-ELECT-LP-02703, 600/480/208 VAC Electrical Lesson Plan

1- Bold Unit 1
2- Added "RBCCW" pump motor
3- Add "after 15 minutes" the breaker for the ..... (If the charger was out long enough the alternate would be carrying the bus. (From lessson Plan: If battery voltage drops below 208 VDC, the alternate power supply from 600 VAC Essential Bus "C" will automatically pick up the Vital AC Bus.))

RFA Approved 10/23/2007

Tier:	1	Group:	1
Keyword:	AC-DC	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

39. 295004AA2.04 003/1/1/DC LINEUP/NEW/FUND/HT2007-301/RO/BLC/RFA

Unit 2 is operating at 100% power and the following alarm is received:

STA SVC SWGR DC OFF (651-143)

The operator determines that one of the four power available lights on the TOP row of the DC Control Power indicating lights at Panel 2H11-P651 is EXTINGUISHED. (the other lights are illuminated)

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

A. NONE of the 4KV circuit breakers will work on one bus.

B. One 4KV bus is de-energized.

C. NONE of the 600V circuit breakers will work on one bus.

D. One 600V bus is de-energized.

A. Correct. See Lesson Plan R42-ELECT-LP-02704 page 32 of 95

B. Incorrect because the 4KV bus will remain energized. Only the control power to the 4KV bus is lost. Plausible if applicant thinks that panel H11-P651 status lights reflect bus energized/de-energized status (versus control power available/unavailable).

C. Incorrect because the top row of lights pertains ONLY to 4KV station service buses. Plausible if the applicant does not know that the 600 KV status lights are on the second row at panel H11-P651.

D. Incorrect because the top row at panel H11-P651 pertains to 4KV buses. Plausible if applicant thinks that panel H11-P651 status lights reflect bus energized/de-energized status (versus control power available/unavailable).

AA2 Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER : (CFR: 41.10 / 43.5 / 45.13) AA2.04 System lineups..... 3.2 / 3.3

References:
R42-ELECT-LP-02704, page 32 of 95, DC Electrical Distribution lesson plan
Annunciator procedure for STA SVC SWGR DC OFF, Alarm Panel 2H11-P651-1, 143-2

1- Bold Unit 2, add -"2"H11
2- add -"four" in front of power available, and "of the DC Control Power indicating lights " after top row to help describe the location of the extinguished light.
3- Delete "K" in KV

RFA Approved 10/23/2007

QUESTIONS REPORT

for RO Final Version 11.26.2007

Tier:	1	Group:	1
Keyword:	DC LINEUP	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

40. 295005AK3.03 004/1/1/LOW FW TEMP/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Unit 1 is operating with the following conditions:

- APRM Power: 20-21%
- Feedwater Temperature: 240 °F
- Turbine 1st stage pressure: < 25% power pressure equivalent
- Generator Load: 85 MW(e)

Because of emergent problems with the generator voltage regulator system, the operator manually trips the turbine.

Which ONE of the following predicts how the feedwater temperature will change once the turbine is tripped, including the reason for the change?

Feedwater temperature will....

A. lower because the control valves closed.

B. lower because the reactor scrammed.

C. rise because of more heat load on the condenser.

D. rise because the ultra-sonic temperature transducers see laminar flow.

A. Correct. The turbine trip energizes the EHC fast acting solenoids which cause the turbine stop, control, and extraction non-return check valves to close. This eliminates the MSR drain contribution to the 7th stage FW Htr and the 1st stage reheater drain contribution to the 4th stage FW Htr.

B. Incorrect because the turbine trip scram is bypassed < 26.7% 1st stage pressure. Also, the bypass valve capacity (although limited) should be sufficient to accomodate this power. Plausible if applicant doesn't understand the turbine trip scram bypass logic or doesn't know bypass valve capacity.

C. Incorrect because the bypass valves are full open and more heat load is being put into the condenser. Plausible if the applicant thinks that the enthalpy input to the condenser changed when the turbine was tripped.

D. Incorrect because crossflow ultrasonic temperature measurement will still reflect the actual value of feedwater temperature. Plausible if the applicant thinks that the ultra-sonic flow measurement requirements also apply to temperature measurement.

AK3 Knowledge of the reasons for the following responses as they apply to MAIN TURBINE GENERATOR TRIP: (CFR: 41.5 / 45.6) AK3.03 Feedwater temperature decrease..... 2.8 / 3.0

References:
Main Turbine Lesson Plan N30-MTA-LP-01701, page 46 of 109
Plant Startup Procedure 34GO-OPS-001-1
MSR, Extraction Steam, & Heater Shell Drain System (34GO-OPS-042-1)
Feedwater Temperature vs Core Power Map (34GO-OPS-005-1)

WHEN the main turbine is reset, the extraction steam check valves AND 10th & 12th stage extraction isolation valves to the feedwater heaters will OPEN AND extraction steam flow will be established WHEN steam is admitted to the main turbine (34GO-OPS-042-1)

Unit 1: 21.2% bypass valve capacity (EPU = 21.2%)
Unit 2: 20.2% bypass valve capacity (EPU = 20.6%)

UFM relies on turbulent FW flow for its calculations to be accurate. With reactor power < 80%, feedwater flow is too laminar for UFM to be accurate.

1- Bold Unit 1, bullet conditions
2- Delete all of 1st paragraph except "**Unit 1** is operating with the following conditions." All other parts are covered in the conditions or are irrelevant.
3- Delete "just" from manually trips turbine

RFA Approved 10/23/2007

Tier:	1	Group:	1
Keyword:	LOW FW TEMP	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

41. 295006AK1.01 005/1/1/DECAY HEAT/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Unit 2 was operating at 100% for one year when a spurious scram occurred due to surveillance testing. The following conditions exist five minutes after the scram:

- All rods fully inserted
- MSIVs open
- Auxiliary steam loads still in service

Which ONE of the following is the expected bypass valve position and the corresponding inventory makeup that is required to maintain level constant within the normal level band?

A. 1 bypass valve will be fully open
The required makeup exceeds the capacity of one CRD pump

B. 1 bypass valve will be controlling, varying between 0 - 50% open
The required makeup is within the capacity of one CRD pump

C. 1 bypass valve will be controlling, varying between 0 - 50% open
The required makeup exceeds the capacity of one CRD pump

D. 1 bypass valve will be fully open
The required makeup is within the capacity of one CRD pump

A. Incorrect because simulator results are 0 - 50% bypass valve cycling. Plausible if applicant does not understand that stem states the auxiliary steam loads are still in service.

B. Incorrect because CRD pump capacity is ~ 120 gpm whereas actual demand is ~ 0.8 Mlbm/hr. Plausible if applicant does not know the post-scram steaming rate.

C. Correct.

D. Incorrect because simulator results are 0 - 50% bypass valve cycling. Also incorrect because CRD pump capacity is ~ 120 gpm whereas actual demand is ~ 0.8 Mlbm/hr. Plausible if applicant thinks that auxiliary steam loads are sufficient to keep the bypass valves closed and does not know the post-scram steaming rate.

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SCRAM
AK1 Knowledge of the operational implications of the following concepts as they apply to SCRAM: (CFR: 41.8 to 41.10) AK1.01 Decay heat generation and removal..... 3.7 / 3.9

SULCV capacity is 1.5 Mlbm/hr (EOP-SCRAM-LP-20301)

References
Plant specific stand-alone simulator: Mode switch to shutdown scram from 100% power resulted in the following:
1.5 minutes after scram..... main turbine trips
1.75 minutes after scram..... 2% - 50% one bypass valve cycling
3 minutes after scram..... 9% - 50% one bypass valve cycling
5 minutes after scram..... 23 - 34% one bypass valve cycling

1- Bold Unit 2
2- Add - "within the normal level band for" the first 5 minutes.....
3-Add " controlling, varying " to B & D

RFA Approved 10/23/2007

Tier:	1	Group:	1
Keyword:	DECAY HEAT	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

42. 295007AA2.01 021/1/2/DEHC/NEW/FUND/HT2007-301/RO/BLC/RFA

Unit 2 is at 99% power, ascending to rated power following a plant startup when the following alarm is received:

REACTOR VESSEL PRESSURE HIGH (603 -114)

Which ONE of the following identifies the alarm setpoint and the required EHC pressure set?

The alarm setpoint is _____ psig.

For this power level, EHC pressure set should be set to approximately _____ psig.

A. 1055, 945

B. 1055, 1040

C. 1064, 945

D. 1064, 1040

The Hatch digital EHC system has several different computer screen displays for the operator to adjust parameters. The correct display to remedy this high pressure condition is the psi-load display (vs the pressure transmitter display). The pressure set point is set at 920 psig and increased after 92% power to raise reactor pressure to 1025 psig. This is usually to about 945 psi on pressure set. To be less than 100% power and have the high pressure alarm/condition in, the pressure set point was raised above where it should be.

A. Correct.

B. Incorrect because wrong EHC pressure setpoint. Plausible if the applicant does not understand where EHC pressure set, pressure reference point is located and correllation between pressure set and reactor pressure.

C. Incorrect because this is well above the alarm setpoint. Plausible if applicant knows the reactor scram is 1074 psig. Also plausible if applicant understands where EHC pressure set, pressure reference point is located and correllation between pressure set and reactor pressure.

D. Incorrect because this is well above the alarm setpoint and EHC pressure setpoint. Plausible if applicant knows the reactor scram is 1074 psig. Plausible if the applicant does not understand where EHC pressure set, pressure reference point is located and correllation between pressure set and reactor pressure..

HIGH REACTOR PRESSURE
AA2. Ability to determine and/or interpret the following as they apply to HIGH REACTOR PRESSURE :
(CFR: 41.10 / 43.5 / 45.13) AA2.01 Reactor pressure..... 4.1* 4.1*

References
34AR-603-114-2, Reactor Vessel Pressure High annunciator procedure
34GO-OPS-001-2, PLANT STARTUP
C71-RPS-LP-01001, REACTOR PROTECTION SYSTEM

1- This question is unsat due to RPV pressure can Not be read form the EHC panel. EHC is controlling throttle pressure (just prior to the stop valves). It has no direct connection with Rx pressure.
2- Bolded Unit 2
3- Added "Unit 2 is at 99% power ascending to rated....
4- Added "and lower EHC Pressure Set from approximately 950 to 945 psig." for A & C
5- Added "and lower EHC Pressure Set from approximately 1050 to 1045 psig." for B & D
6- Revised distractor and plausibility statements.

RFA Approved 10/23/2007

Tier:	1	Group:	2
Keyword:	DEHC	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

43. 295012AK3.01 001/1/2/DW COOLING/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Unit 1 was initially operating with drywell temperature steady at 135 °F with six drywell cooler fans running and six fans in AUTO not running. Subsequently, a complete loss of offsite power occurred and the lowest RPV level reached during the transient was Level -35 inches.

The following plant conditions currently exist:

- CRD and RCIC are controlling level at 33"
- RPV pressure at 850 psig, being controlled by HPCI & SRVs
- Drywell pressure at 1.2 psig
- Drywell temperature at 140°F
- Diesels are tied to their 4160 V busses

Which ONE of the following is the current status of the drywell cooling unit fans?

A. More drywell cooling fans are running than before the loss of offsite power.

B. The same number of drywell cooling fans are currently running now as compared to before the loss of offsite power.

C. Some of the drywell cooling fans are currently running; however, the number of drywell cooling fans running is less than before the loss of offsite power.

D. None of the drywell cooling fans are currently running.

A. Correct. On a **UNIT 1** LOSP, all cooling unit fans will trip. When power is restored to the respective 600 VAC buses, the fans which are in RUN will automatically restart. The fans which are in AUTO (standby) will also start due to the low flow condition.

B. Incorrect because the fans that were previously in AUTO will auto-start due to the low flow condition. Plausible if applicant thinks that that only the fans in AUTO will be running.

C. Incorrect because of reason listed in A. Plausible if applicant thinks that the CRD cavity high temperature setpoint was reached and only four fans auto started.

D. Incorrect because of the reason listed in A. Plausible if the applicant thinks that the drywell coolers tripped and locked out following the loss of offsite power or if the applicant thinks that a LOCA lockout has occurred.

AK3. Knowledge of the reasons for the following responses as they apply to HIGH DRYWELL TEMPERATURE : (CFR: 41.5 / 45.6) AK3.01 Increased drywell cooling..... 3.5/3.6

References
P64-PCCCW-LP-01304, Primary Containment Cooling & Chilled Water lesson plan

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1- Change Level 2 to -35 inches in stem
2- bullet conditions and delete space between ###s and °F

RFA Approved 10/23/2007

Tier:	1	Group:	2
Keyword:	DW COOLING	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

44. 295013AK1.03 001/1/2/TORUS TEMP/NEW/HIGHER/HT2007-301/RO/BLC/RFA

The **Unit 1** HPCI Pump Operability surveillance test (34SV-E41-002-1) is in progress with the following conditions:

- Torus temperatue is 92°F and increasing at 0.5°F/min
- Engineering has requested that the run be extended for 30 minutes to complete the system walk down
- The current time is: 1400

Given these conditions, SELECT the time that HPCI MUST be stopped to minimize heating of the suppression pool water and the required actions that the crew must perform?

HPCI is required to be stopped at time _____.

Following HPCI termination, _____ of RHR in suppression pool cooling is/are required to be in service in accordance with procedures.

A. 1416
Only One loop

B. 1426
Only One loop

C. 1416
Both loops

D. 1426
Both loops

A. Incorrect because suppression pool temp is at 100°F and is allowed to go to 105°F. Also incorrect because at 100°F both loops of RHR should be placed in suppression pool cooling. Plausible if applicant thinks entering the PC flowchart requires securing heat addition sources. Also plausible because 34AB-T23-003-1 requires only one loop of RHR in suppression pool cooling.

B. Incorrect because at 105°F both loops of RHR should be placed in suppression pool cooling per the PC flowchart. Plausible because HPCI is required to be secured at 105°F suppression pool temp.

C. Incorrect because torus temp is at 100°F and is allowed to go to 105°F. Also incorrect because at 100°F both loops of RHR should be placed in suppression pool cooling. Plausible if applicant thinks entering the PC flowchart requires securing heat addition sources. Also plausible because at 100°F both loops of RHR should be placed in suppression pool cooling.

D. Correct

AK1. Knowledge of the operational implications of the following concepts as they apply to HIGH SUPPRESSION POOL TEMPERATURE : (CFR: 41.8 to 41.10) AK1.03 Localized heating..... 3.0/3.3

References:
34SV-E41-002-1, HPCI Pump Operability
34SV-SUV-019-1, Torus Temperature Monitoring
34AB-T23-003-1S, Abnormal Operating Procedure Torus Temperature Above 95 °F
31EO-EOP-012-1, Primary Containmnet Flow Chart

This question, as written, is Unsat and is incorrect. Max run time in minutes = [105 - Tinitial] * 2 would be 50 minutes ([105-80]*2 = 50 minutes (25 * 2 = 50).
Also, this question as written, requires to much knowledge from memory: Calculation of torus temperature formulas due to an inoperable SPDS and recorder from a surveillance procedure attachment and the limitations associated with that calculation. Memory of inputs into a recorder.

See new question and distractor and plausibilty statements

RFA Approved 10/23/2007

Tier:	1	Group:	2
Keyword:	TORUS TEMP	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

45. 295014G2.1.30 001/1/2/REACTIVITY/NEW/HIGHER/HT2007-301/RO/BLC/RFA

A heatup and pressurization is in progress on **Unit 1** with reactor pressure at 75 psig. Reactor water level is being maintained with RWCU & CRD. IRMs are on range 7 and 8. The following lineup currently exists:

- The condensate and feedwater system is in LONG CYCLE cleanup
- SULCV F212 is CLOSED, i.e., C32-R619 controller in MANUAL with output at 0"
- SULCV upstream isolation valve (F036) is OPEN
- SULCV bypass valve (F406) is OPEN

As the operator opens the FW to Rx Isolation Valves (1N21-F006A & B) in preparation for low pressure feedwater injection, the "C" IRM high high setpoint is reached and the following alarms are received:

- **REACTOR NEUTRON MONITORING SYS TRIP** (603-109)
- **REACTOR AUTO SCRAM SYSTEM A TRIP** (603-117)
- **IRM BUS A UPSCALE TRIP OR INOP** (603-203)
- **IRM UPSCALE** (603-221)

Given these conditions, which ONE of the following valves is required to be closed to mitigate the reactivity excursion?

A. Feedwater Cleanup Recirc FCV (1N21-F165)

B. Condensate Demineralizer Bypass valve (1N21-F014)

C. Startup LCV isolation valve (1N21-F036)

D. Startup LCV Bypass valve (1N21-F406)

A. Incorrect since closing this valve will divert more feedwater to the reactor. Plausible if applicant thinks that this valve feeds the reactor.

B. Incorrect because the cold water reactivity addition will continue and possible cause another half scram. Plausible if the applicant knows that some IRM response will occur as the vessel is fed and if the applicant thinks that the event occurred due delayed ranging of the IRM.

C. Incorrect because the initial condition was that the SULCV 212 was in manual with output at 0", i.e., this valve is in series with the F036.

D. Correct. Given the current lineup, this is the only path that is allowing feedwater flow to the reactor.

APE: 295014 Inadvertent Reactivity Addition
G2.1.30 Ability to locate and operate components / including local controls. (CFR: 41.7 / 45.7)
IMPORTANCE RO 3.9 SRO 3.4

References
34SO-N21-007-1, Section 7.1.5, Low Pressure Feedwater Injection
34AR-603-109-1, Reactor Neutron Monitoring Sys Trip alarm procedure
34AR-603-117-1, Reactor Auto Scram System A Trip alarm procedure
N21-CNDFW-00201, Condensate and Feedwater lesson plan

1- Bold Unit 1, bullet conditions
2- Delete ensure and does not occur in stem, replace with "help avoid". Closing the valve is the right action to take, but it may not ensure a full scram does not occur, depending on readings on other IRMs.

RFA Approved 10/23/2007

Tier:	1	Group:	2
Keyword:	REACTIVITY	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

46. 295015AK2.08 001/1/2/ATWS/NEW/HIGHER/HT2007-301/RO/BLC/RFA

A group 1 isolation due to a steam leak occurred on **Unit 2** and most control rods failed to insert. (i.e., an ATWS has occurred.) RPV level was lowered in accordance with 31EO-EOP-113-2, Terminating and Preventing Injection to the RPV. SLC was injected due to torus temperature.

The SLC tank level has reached 34% and RPV level is now -35". As level is being raised to the normal level band, the operator receives the following alarms/indications:

- **IRM UPSCALE** (603-221-1) alarm is illuminated
- **IRM BUS A & B UPSCALE TRIP OR INOP** (603-203 & 212) both illuminated
- **SRM PERIOD** (603-231) alarm is illuminated
- APRM DOWNSCALE (603-228) alarm is extinguished
- APRM ODAs at 11% power
- Suppression Pool Temperature is 120°F

Which ONE of the following actions should be taken?

[Reference Provided]

A. Terminate and prevent injection per 31EO-EOP-113-2.

B. Continue to raise RPV water level to +3" to +50."

C. Stop raising RPV water level and maintain -34" as the upper level limit.

D. Stop raising RPV water level and re-inject only if RPV level lowers to -60."

Applicant Reference: Provide applicant BITT Curve (Graph 5) for Unit 2

A. Correct based on CP-3 override at D2

B. Incorrect because neutron monitoring indications reflect reactor power rising above 5%. Plausible if applicant thinks that once hot (or cold) boron weight has been injected it is acceptable to raise level irrespective of reactor power increases.

C. Incorrect because of CP-3 override at D3. Plausible if applicant thinks that once 31EOP-EOP-113-2 has been performed that it is not necessary to re-perform.

D. Incorrect because of CP-3 override at D3. Plausible if applicant thinks that level should be re-lowered but terminating and preventing all injection systems is unnecessary.

Provide BITT Curve (Graph 5) for Unit 2

AK2. Knowledge of the interrelations between INCOMPLETE SCRAM and the following:
(CFR: 41.7 / 45.8) AK2.08 Neutron monitoring system..... 3.6/3.7

References
CP-3 (Unit 2), ATWS Level Control flowchart
31EO-EOP-113-2, Terminating and Preventing Injection to the RPV
RCA (Unit 2), RPV Control (ATWS)
C51-PRNM-LP-01203, Power Range Neutron Monitoring lesson plan

1- Bold Unit 2, bullet conditons
2- Add "Suppression Pool Temperature is 120°F" to conditions
3- Add "[Reference Provided]" and provide Boron Injection Initiation Temperature Graph, Graph 5

RFA Approved 10/23/2007

Tier:	1	Group:	2
Keyword:	ATWS	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

47. 295016AA1.06 006/1/1/REMOTE SD/NEW/FUND/HT2007-301/RO/BLC/RFA

The control room has been abandoned and 31RS-OPS-001-2, Shutdown From Outside Control Room, is being implemented. All RSDP transfer switches have been placed in the EMERGENCY position.

Which ONE of the following will correctly complete the statement below for water level control using RCIC?

At the **Unit 2** remote shutdown panel, if reactor water level decreases to -35 inches RCIC _____ automatically start. If reactor water level increases to 52 inches RCIC Steam Supply valve, 2E51-F045, _____ automatically close.

A. will / will

B. will / will NOT

C. will NOT / will

D. will NOT / will NOT

Note: When the Remote Shutdown Panel Transfer Switches for RCIC are in EMERGENCY, then All auto and manual RCIC turbine trips are still operable except automatic closure of 2E51-F045, Steam to Turbine Vlv, on Reactor vessel high level is disabled. Also, auto initiation of reactor vessel low level signal is disabled.

A. Incorrect because auto start is disabled and high water level trip is disabled. Plausible since some other automatic trips are still operable.

B. Incorrect because auto start is disabled. Plausible because some automatic features are still available, i.e., turbine trips

C. Incorrect because high level closure of 2E51-F045 on high vessel level is disabled. Plausible since other turbine trips are still available.

D. Correct

AA1. Ability to operate and/or monitor the following as they apply to CONTROL ROOM ABANDONMENT: (CFR: 41.7 / 45.6) AA1.06 Reactor water level..... 4.0 / 4.1

References:
31RS-OPS-001-1, Unit 1 Shutdown from outside the control room procedure
C82-RSDP-05201, Remote Shutdown Panel lesson plan

1- Recall too specific from memory. Weak tie to K/A - ability to operate/monitor reactor water level - question is memory of instruments on panel. (Replace)

BLC: updated distractor analysis for licensee's replacement question 11/20/07

Tier:	1	Group:	1
Keyword:	REMOTE SD	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

48. 295017AK1.02 001/1/2/RELEASE/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Primary containment conditions require venting in accordance with path G-1, left most leg, of the Primary Containment Gas Control flowchart (PCG).

Which ONE of the following describes the preferred method for removing combustible gases and when must this release be secured?

Vent the _____. Secure the venting only if the projected TEDE reaches _____ mR/hr

A. drywell, 0.057

B. drywell, 1000

C. torus, 0.057

D. torus, 1000

Note: G-1 flowpath has termination criteria of 0.057 mr/hr. G-2 flowpath has termination criteria of 1000 mr/hr.

A. Incorrect because the preferred method of releasing is from the torus (due to scrubbing). Plausible since replacement nitrogen to both spaces (drywell and torus) will mitigate the combustible gas concentration quicker.

B. Incorrect because the preferred method of releasing is from the torus (due to scrubbing). Also incorrect because the venting must be secured at 0.057 mr/hr IAW G-1. Plausible since replacement nitrogen to both spaces (drywell and torus) will mitigate the combustible gas concentration quicker. Also plausible since 1000 mr/hr is termination value for path G-2.

C. Correct per 31EO-EOP-104-2 and PCG flowchart.

D. Incorrect because the venting must be secured at 0.057 mr/hr IAW G-1. Plausible since 1000 mr/hr is termination value for path G-2.

AK1. Knowledge of the operational implications of the following concepts as they apply to HIGH OFF-SITE RELEASE RATE : (CFR: 41.8 to 41.10) AK1.02 †Protection of the general public..... 3.8* 4.3*

References
31EO-EOP-104-2, Primary Containment Venting For Hydrogen and Oxygen Control
31EO-EOP-012-2, Primary Containment Control flowchart
31EO-PCG-001-2, Primary Containment Gas Control

1- Beyond RO memory knowledge
2- Delete from Vent the Drywell (Torus) to end of sentence on all four distractors.

RFA Approved 10/23/2007
BLC updated distractor analysis only 11/20/07

Tier:	1	Group:	2
Keyword:	RELEASE	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

49. 295018AK2.02 007/1/1/RBCCW/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Unit 2 has been operating for 87 days at 100% power and all equipment is normally aligned.

A fire occurs in the 2C 600VAC switchgear causing the bus to be de-energized and the earliest time to re-energize the bus is 2 hours.

Which ONE of the following identifies a parameter that will be affected, including a required corrective action associated with this parameter, in accordance with 34AB-P42-001-2, Loss of Reactor Building Closed Cooling Water (RBCCW)?

A. RBCCW flow inside the containment is inadequate.
A manual scram is required.

B. RBCCW surge tank level will lower.
Local use of the 2P42-F055, level control valve bypass valve is required to raise level.

C. RBCCW temperature will rise.
The standby RBCCW pump must be started.

D. RBCCW pressure will lower and then stabilize.
The standby PSW pump should be manually started until the bus is re-energized.

600V Emergency Bus 2C supplies 2 of the 3 RBCCW pumps, i.e., 2A & 2C pumps.

A. Correct. AOP 34AB-P42-001-2, Step 4.7

B. Incorrect because surge tank level will rise due to heatup. Plausible if applicant thinks that one pump trips (causing a level drop) and that the loss of power affects the auto makeup valve logic.

C. Incorrect because there are no other pumps available, i.e., two pumps are currently lost. Plausible if applicant does not know the power supplies to the RBCCW pumps.

D. Incorrect because the a scram is required before two hours. Plausible if applicant thinks that standby pump auto starting causes some minor pressure pertubation which would necessitate concerns over PSW-to-RBCCW delta P.

AK2. Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER and the following: (CFR: 41.7 / 45.8) AK2.02 Plant operations.....3.4/ 3.6

References:
AOP 34AB-P42-001-2, Loss of Reacto Building Closed Cooling Water
RBCCW Lesson Plan P42-RBCCW-LP-00901
AOP 34AB-R23-001-2, Loss of 600 Volt Emergency Bus
34AR-650-249-2, RBCCW Hx Outlet Temp High annunciator procedure
34-AR-650-248-2, Surge Tank Level Low annunciator procedure

1- Bold Unit 2 and 2C

RFA Approved 10/23/2007

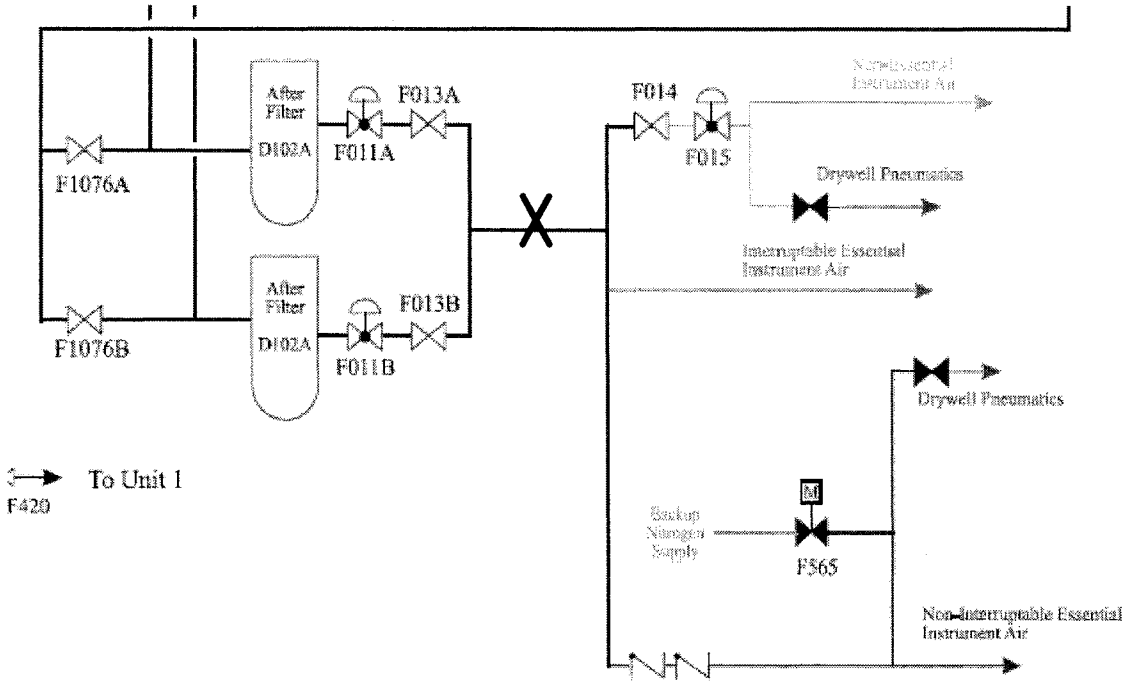
Tier:	1	Group:	1
Keyword:	RBCCW	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

50. 295019AK2.11 008/1/1/PNEUMATIC/NEW/HIGHER/HT2007-301/RO/BLC/RFA

A total loss of Instrument Air occurs on **Unit 2** from a break as shown by the "X."

Which ONE of the following describes how this loss of Instrument Air will affect the following plant components?

All other systems respond as designed.



The **Unit 2**...

A. condensate demineralizer outlet valves will fail closed

B. outboard MSIVs fail closed.

C. fuel pool to transfer canal gate seals (inner and outer) will depressurize.

D. radwaste ventilation dampers will fail closed.

Note: Condensate demin pneumatic valves supplied from Non-Essential IA; Outboard MSIVs supplied from Non-Interruptible Essential IA but backup N2 will also supply; U2 Fuel pool to transfer canal seals have different pneumatic supplies from U1 and U2 for the inner & outer seal, i.e., loss of air on on unit will not cause both seals to depressurize.

A. Incorrect because the demineralizer effluent valves will lock as is. Plausible because valves are pneumatically supplied from the Non-essential instrument air header, i.e., downstream of the leak shown.

B. Incorrect because the outboard MSIVs have a backup nitrogen supply. Plausible since these valves are supplied from the Non-Interruptible Essential Instrument Air header, i.e., downstream of the leak shown.

C. Incorrect because U2 Fuel pool to transfer canal seals have different pneumatic supplies from U1 and U2 for the inner & outer seal, i.e., loss of air on on unit will not cause both seals to depressurize. Plausible because the fuel pool to cavity gate seals (inner and outer) will depressurize.

D. Correct.

AK2. Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR and the following: (CFR: 41.7 / 45.8) AK2.11 Radwaste..... 2.5 / 2.6

References:
P51-P52-P70-PLANT AIR-LP-03501, Pneumatic Systems lesson plan
N21-CNDFW-LP-00201, Condensate & Feedwater lesson plan
34SO-N21-007-1, Attachment 2, Condensate & Feedwater System valve lineup (pg 24,25 of 44)
Licensee verified prints: Need print numbers from licensee.

1- Recall too specific for memory. Applicant must basically know what air header every load in the plant is supplied from.

RFA Approved 10/23/2007

Tier:	1	Group:	1
Keyword:	PNEUMATIC	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

51. 295021AK2.07 001/1/1/RHR/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Unit 1 is in Mode 4 preparing for startup after a forced mid-cycle shutdown with the following conditions:

- RHR Loop "B" is in Shutdown Cooling w/ 7900 gpm
- Both Recirc Pumps OFF w/ discharge valves closed and suction valves open
- 1E41-R605, RHR Water Temp on Panel 1H11-P614 is 185°F
- RWCU Inlet temperature is 187°F
- RPV level is 37"

As the operator was performing a surveillance on the "1B" Recirc Pump discharge valve, the valve opened as required but would not re-close. The auxiliary operator is currently investigating the valve motor breaker.

Given these plant conditions, which ONE of the following describes how this valve being open will affect RWCU and RHR temperatures?

Actual core coolant temperature will _____.
RHR heat exchanger inlet water temperature will _____.

A. rise / lower

B. remain the same / lower

C. rise / rise

D. remain the same / rise

Note: On Unit 1, RHR shutdown cooling suction comes from the "B" Recirc loop. (different on Unit 2).

A. Correct.

B. Incorrect because core is not receiving any forced circulation; given this decay heat load, the actual core coolant temperature will rise. Plausible because applicant may not recognize core bypass conditions because shutdown cooling remains in service.

C. Incorrect because RHR inlet water temperature will lower because this water is no longer circulating around hot fuel. Plausible if applicant knows core temperature is rising.

D. Incorrect because core is not receiving any forced circulation; given this decay heat load, the actual core coolant temperature will rise. Also incorrect because RHR inlet water temperature will lower because this water is no longer circulating around hot fuel. Plausible if applicant thinks that the RHR pump is dead headed.

AK2. Knowledge of the interrelations between LOSS OF SHUTDOWN COOLING and the following:
(CFR: 41.7 / 45.8) AK2.07 Reactor recirculation..... 3.1 / 3.2

References:
34SV-B31-001-1, Recirculation System Valve Operability
34SO-E11-010-1, RHR System
34SO-B31-001-1, Reactor Recirc System
34AB-E11-001-1, Loss of Shutdown Cooling
E11-RHR-LP-00701, RHR lesson plan

1- Bold Unit 1 and closed, open for recirc valves, change bullets to match rest of exam.
2- Change plausibility statement for C & D to RWCU and SDC take a suction from "B" Recirc. This is because it is Unit 1; Unit 2 is from "A" Recirc line

RFA Approved 10/23/2007
BLC updated distractor analysis and added "after a forced mid-cycle shutdown" to the stem (to imply decay heat load) and also added "heat exchanger inlet" to clarify which RHR water temperature stem was asking about. 11/20/07

Tier:	1	Group:	1
Keyword:	RHR	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

52. 295022AK2.07 001/1/2/CRD/NEW/FUND/HT2007-301/RO/BLC/RFA

If a loss of both CRD pumps occurred, while a control rod accumulator is unavailable, the scram insertion time for that rod would be _____ if reactor pressure was _____ psig as compared to _____ psig.

A. shorter
1000 / 800

B. shorter
200 / 800

C. longer
1000 / 600

D. longer
1000 / 200

A. Correct because scram time at 1000 psig is faster than 800 psig with the accumulator not pressurized.

B. Incorrect because the higher pressure in the reactor inserts the rod faster. Plausible because 200 psig would be faster than 800 psig if the accumulator was operable

C. Incorrect because the higher pressure in the reactor inserts the rod faster. Plausible if applicant thinks the increased reactor pressure offers more resistance to rod insertion as compared to the driving force.

D. Incorrect because the higher pressure in the reactor inserts the rod faster. Plausible becuase 200 psig would be faster than 1000 psig if the accumulator was operable

AK2. Knowledge of the interrelations between LOSS OF CRDPUMPS and the following: (CFR: 41.7 / 45.8)
AK2.07 Reactor pressure (SCRAM assist): Plant-Specific..... 3.4 /3.6

References
C11-CRDM-LP-00102, Control Rod Drive lesson plan
34AB-C11-001-2, Loss of CRD System abnormal operating procedure

Modified question to have inoperable accumulator. Remembering the exact breakdown of insertion times at specific reactor pressures requires to much memory recall. The modified question can be backed up by procedure actions (>900 compared to <900) and closely ties to the KA for reactor pressure scram assist.

RFA Approved 10/23/2007

Tier:	1	Group:	2
Keyword:	CRD	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

53. 295023AK2.01 010/1/1/REFUELING/NEW/HIGHER/HT2007-301/RO/BLC/RFA

During refueling operations, a spent bundle was being lowered into the fuel rack using the main fuel grapple. When the bundle was seated in the fuel rack, the operator could not get the grapple to release the bundle despite repeated operation of the grapple open/close switch. The operator then raised the bundle with the intention of rotating it 90 degrees and lowering it again.

When the operator started to lower the bundle (after rotating it) the bundle hung up on the fuel rack, i.e., did not slide into the slot. When the bundle hung up on the fuel rack, the grapple opened. The operator then noticed that the bundle proceeded to tip away from the mast and fall across other irradiated fuel storage racks in the spent fuel pool.

Given this information, which ONE of the following fuel handling equipment problems caused the grapple hook to open?

A. Loss of air pressure to the refueling platform

B. ✓ Grapple open/closed switch left in the open position

C. System Stop pushbutton was depressed when the hoist jam light illuminated

D. Loss of electrical power to the refueling platform

K/A requires knowledge of refueling accidents. Question is somewhat backwards logic; however, this event was an actual event at Quad Cities. Industry event related questions are historical, and, by their nature, are somewhat backwards logic.

A. Incorrect because the grapple hooks fail closed on a loss of air. Plausible if applicant thinks that hooks fail open on loss of air.

B. Correct. If the open/close switch switch was left in the open position before the operator raised the bundle it would still remain closed due to the bail handle keeping the hooks closed. Then as it jammed on the fuel rack, the weight of the bundle came off these grapple hooks. Since the engage switch was left in the open position, the grapple hooks opened and released the bundle.

C. Incorrect because when the system stop pushbutton is depressed, the fuel grapple hook will close automatically. Plausible if applicant thinks that grapple hooks open when system shutdown occurs.

D. Incorrect (2R24-S015 Fr 8 BR) because a loss of power will not cause the grapple to release. Plausible if applicant thinks that grapple hooks open when a loss of electricity occurs.

AK2. Knowledge of the interrelations between REFUELINGACCIDENTS and the following: (CFR: 41.7 / 45.8)
AK2.01 Fuel handling equipment..... 3.3 / 3.7

Per industry events section of refueling lesson plan, this event occurred at Quad Cities Unit 1, September 1989
References
F15-RF-LP-04502 Refueling lesson plan

RFA Approved 10/23/2007

Tier:	1	Group:	1
Keyword:	REFUELING	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

54. 295024EK1.01 011/1/1/CONTAINMENT/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Following a LOCA on **Unit 1**, the crew has determined that the following containment parameters have increased to and stabilized at the following values:

- Drywell pressure ..... 48 psig
- Torus pressure..... 44 psig
- Torus level ..... 20 feet

Which ONE of the following is an operational implication of these containment parameters?

A. Torus venting will occur at this time if the T48-F326 and -F318 valves are opened in accordance with 31EO-EOP-101-1, Emergency Containment Venting.

B. The pneumatic operators on the drywell vent valves T48-F320 and -F319 cannot physically function due to high drywell pressure regardless of interlocks.

C. The pneumatic operators on the safety relief valves cannot physically function due to high drywell pressure regardless of reactor pressure.

D. After the drywell is vented in accordance with 31EO-EOP-101-1, Emergency Containment Venting, the RHR and Core Spray NPSH will be less.

A. Incorrect because the rupture disc setpoint is not until 51 psig. Plausible if applicant knows that torus vent path is still uncovered at 20 feet.

B. Incorrect because the pressure capability of the containment is the basis for the Hatch Primary Containment Pressure Limit. Plausible if the applicant knows that this component is one of the items evaluated to determine the Primary Containment Pressure Limit.

C. Incorrect because the pressure capability of the containment is the basis for the Hatch Primary Containment Pressure Limit. Plausible if the applicant knows that this component is one of the items evaluated to determine the Primary Containment Pressure Limit.

D. Correct. Caution 7: reducing primary containment pressure will reduce the available NPSH for pumps taking suction from the torus.

EK1. Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL PRESSURE : (CFR: 41.8 to 41.10) EK1.01 Drywell integrity: Plant-Specific..... 4.1 / 4.2*

References:
31EO-EOP-101-1, Emergency Containment Venting
T23-PC-LP-01301, Primary Containment

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1- Bold Unit 1, bullet conditions
2- Delete "limits" and "affected", replace with will be "less" to make completely accurate
3- Add "due to high drywell pressure" in B & C (You don't that these valves will due to some other reason that's not given

RFA Approved 10/23/2007

Tier:	1	Group:	1
Keyword:	CONTAINMENT	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

55. 295025EK1.03 012/1/1/SRV/NEW/HIGHER/HT2007-301/RO/BLC/RFA

A spurious group 1 isolation occurred on **Unit 1.** The following conditions were noted (not all alarms are listed):

- All control rods did NOT insert
- Reactor Power is 17%
- "Safety/Blowdown Valve Leaking" alarm received
- 4 SRV amber lights are lit

All other systems responded as designed.

During the transient, the following sequence of RPV pressures occurred:

- pressure peaked at 1125 psig
- pressure decreased to 870 psig
- pressure then increased slowly over ten minutes to its current value of 1000 psig

Assuming no operator action, which ONE of the following is correct at the SRV Tailpipe Temperature recorder (1B21-R614) located at panel H11-P614?

_____ tailpipe temperatures are approximately _____ and stable.

[Reference provided]

A. Two; 380 deg

B. Four; 550 deg

C. Four; 380 deg

D. Two; 550 deg

Applicant Reference: Provide applicant Unit 34SO-B21-001-1 page 13 of 34, step 7.2.3 note block (rev 12.6)

Note: During the transient, Low Level set armed when reactor pressure surpassed 1074 psig and then four SRVs (A, C, G, H) opened as pressure peaked. Two of these valves cycled closed as pressure dropped to 870 psig (C- 887, G-877). Two of these valves remain open (A & H) while pressure is 1000 psig.

SRV open tailpipe temperature is ~ 380 deg
SRV closed tailpipe temperature is ~ 150 deg
Saturation pressure at 1000 psig is ~ 550 psig

A. Correct.

B. Incorrect because none of the tailpipe temperatures would be at 550 deg because this is the saturation temperature for 1000 psig. Instead, A&H are open with tailpipe temperature at 380 deg whereas G&C are closed with tailpipe temperature trending towards 150 deg. Plausible if applicant knows that F013 H, A, G, & C all initially opened when low level set armed.

C. Incorrect because two of the 11 SRVs actually lifted and have re-seated; therefore their temperature would be trending down towards 150 deg. Plausible if applicant thinks that four low low set SRVs are still open.

D. Incorrect because this temperature corresponds to the saturation pressure at 1000 psig (vs exit pressure of the tailpipe following an isenthalpic process). Plausible if applicant does not know the temperature lowers via the throttling process.

provide reference Unit 1 34SO-B21-001-1 page 13 of 34, step 7.2.3 Note block (version 12.6)

EK1. Knowledge of the operational implications of the following concepts as they apply to HIGH REACTOR PRESSURE: (CFR: 41.8 to 41.10) EK1.03 Safety/relief valve tailpipe temperature/pressure relationships. 3.6 /3.8

References
B21-SLLS-LP-01401, Main Steam & Low Low Set lesson plan

1- Bold Unit 1, add unit # to B21, bullet conditions and reactor pressures
2- Move that all systems responded as designed to new sentence and add all control rods did not insert in first sentence. Add reactor power is at 15% to conditions. (The only plausible way to keep two SRVs open after a scram and Rx pressure stable would to be generating about 16% power, therefore must be an ATWS.)
3- Change 875 to 870. (875 is only a 2 psig margin from closing setpoint on G SRV.)
4- Change 330 to 350 in A & B (closer to hatch number), change 450 to 550 in D. Makes number match plausibitly statement. (Saturation temp at 1000psig.)
5-To bullet proof Add "**Ten** minutes after the lowest pressure was reached,"a delete currently
6- Add "deg F and stable to each distractor" and delete from question.

RFA Approved 10/23/2007
BLC updated distractor analysis only 11/20/07

Tier:	1	Group:	1
Keyword:	SRV	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

56. 295026EK2.03 015/1/1/TORUS TEMP/NEW/FUND/HT2007-301/RO/HATCH

An RHR pump is currently operating at the net positive suction head (NPSH) limit.

Which ONE of the following describes how torus pressure and torus temperature impact RHR pump operation?

As torus pressure decreases, the EOP NPSH limit becomes _____ making cavitation _____ likely for a given torus temperature and pump flow rate.

A. less restrictive/ less

B. less restrictive / more

C. more restrictive / less

D. more restrictive / more

A. Incorrect because as the limit becomes more restrictive as torus pressure lowers. Also incorrect because cavitation becomes more likely as the limit becomes more restrictive. Plausible if applicant thinks that the RHR pump operating point changes when torus pressure changes, i.e., flow changes.

B. Incorrect because as the limit becomes more restrictive as torus pressure lowers. Plausible if applicant thinks that a less restrictive curve moves the pump further away from cavitation.

C. Incorrect because cavitation becomes more likely for a lower torus pressure. Plausible if the applicant assumes that the more restrictive limit somehow prevents cavitation.

D. Correct.

Substiture KA due to double jeopardy with question # 44 (KA295013K1.03)- new KA randomly selected by NRC

New KA

295026 Suppression Pool High Water Temperature
Knowledge of the interrelations between SUPPRESSION POOL HIGH WATER TEMPERATURE and the following: (CFR: 41.7 / 45.8): EK2.03 Suppression chamber pressure: Mark-I&II 3.2/3.6

[Old KA
EK1. Knowledge of the operational implications of the following concepts as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: (CFR: 41.8 to 41.10) EK1.02 Steam condensation..... 3.5 / 3.8]

References
EOP-CURVES-LP-20306, EOP Curves Lesson Plan
EOP Curve 12A, RHR NPSH Limit

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Licensee replaced question after new KA selected by NRC

BLC updated distractor analysis 11/20/07

Tier:	1	Group:	1
Keyword:	TORUS TEMP	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	HATCH

57. 295026G2.4.23 013/1/1/TORUS TEMP/NEW/FUND/HT2007-301/RO/BLC/RFA

Which ONE of the following is the basis for the sloping portion of the Boron Injection Initiation Temperature (BIIT) limit curve and one of the required actions to be taken before this limit is reached?

A. Ensures that the suppression pool Tech Spec temperature will NOT be exceeded.

Initiate a manual scram per placard RC-1

B. Ensures Cold Shutdown boron weight is injected before the torus heat capacity is exceeded.

Initiate SBLC per 34SO-C41-003-1

C. Ensures Hot Shutdown boron weight is injected before the torus heat capacity is exceeded.

Initiate SBLC per 34SO-C41-003-1

D. Ensures Cold Shutdown boron weight is injected before the torus heat capacity is exceeded.

Initiate a manual scram per placard RC-1

A. Incorrect because the sloping portion of the BIIT curve ensures that torus heat capacity is not exceeded before hot shutdown boron weight is injected. Plausible since the flat portion of the BIIT curve is truncated at the Tech Spec limit temperature which does require a manual scram.

B. Incorrect because the basis for the sloping portion is the completion of HOT shutdown boron weight before torus heat capacity is exceeded. Plausible since cold shutdown boron weight is another EOP criterion.

C. Correct

D. Incorrect because the basis for the sloping portion is the completion of HOT shutdown boron weight before torus heat capacity is exceeded. Also incorrect because SLC injection is required before exceeding the BIIT sloping curve limit (not a manual scram). Plausible since cold shutdown boron weight is another EOP criterion and a manual scram is a required action for the flat portion of the BIIT curve at 110 deg.

EPE: 295026 Suppression Pool High Water Temperature
G2.4.23 Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.
(CFR: 41.10 / 45.13) 2.8/3.8

References
Tech Spec Bases B 3.6.2.1, Suppression Pool Average Temperature
BWROG EPGs/SAGs, Appendix B, Section 17.1 Boron Injection Initiation Temperature
EOP-RC-LP-20308, RPV control (non-atws)
PC Primary Containment Control Flowchart
EOP-Curves-LP-20306, EOP Curves and Limits lesson plan

1- Capitalize letters in words for BIIT, Tech Spec, Cold and Hot Shutdown, and NOT all caps
2- To make C completely true Add " sloping portion of the Boron Injection Initiation Temperature (BIIT) limit curve". (The C answer is not correct for the horizontal line that is the limit on the lower part of the curve.)

RFA Approved 10/23/2007
BLC updated distractor analysis only11/20/07

Tier:	1	Group:	1
Keyword:	TORUS TEMP	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

58. 295028EK2.01 015/1/1/DW SPRAY/NEW/HIGHER/HT2007-301/RO/BLC/RFA

A small break LOCA occurred and the drywell chillers are tripped and cannot be re-started. Drywell Sprays have already been initiated and stopped once; however, the containment temperature is slowly rising again. The following conditions currently exist on **Unit 2**:

- Drywell pressure 7 psig
- RPV water level 32" and steady
- Reactor Pressure 300 psig
- Torus Water Level 148" and steady

Which ONE of the following identifies when drywell sprays are initially required to be initiated in accordance with the primary containment control procedure and also identifies when sprays are allowed to be re-initiated given the current plant conditions?

[Reference provided]

A. Drywell sprays are required to be intiated BEFORE the average of all the drywell temperature points reaches 280 °F

   Drywell temperature at 300 °F and slowly rising

B. Drywell sprays are required to be intiated BEFORE the average of all the drywell temperature points reaches 280 °F

   Because curve 8 was already evaluated the first time sprays were initiated, sprays may be re-initiated a second time without re-evaluating temperature on curve 8.

C. Drywell sprays are required to be intiated BEFORE the average of all the drywell temperature points reaches 340 °F

   Drywell temperature at 225°F and slowly rising

D. Drywell sprays are required to be intiated BEFORE the average of both the drywell and torus air temperature points reaches 340 °F

   Because curve 8 was already evaluated the first time sprays were initiated, sprays may be re-initiated a second time without re-evaluating temperature on curve 8.

Applicant Reference: Provide applicant Unit 2 Curve 8 to applicants. Do NOT provide Primary Containment Flowchart.

Note: Unit 1 and 2 have different DW temperature spray initiation thresholds: U1 is 280 deg; U2 is 340 deg. Choices A & C both have good safe values on Curve 8.

A. Incorrect because this is the wrong unit's initiation temperature. Plausible if applicant thinks that the lowest temperature will satisfy the stem of the question; however, stem specifies in accordance with the pc procedure. 300 deg is a safe value on the curve.

B. Incorrect because this is the wrong unit's initiation temperature. Also incorrect because Note 10 specifies that curve 8 must be re-evaluated again. Plausible if applicant thinks that the lowest temperature will satisfy the stem of the question (however, stem specifies in accordance with the pc procedure).. OR if the applicant does not know the rules for Curve 8 usage.

C. Correct. 225 deg is a safe value on the curve

D. Incorrect because Note 10 specifies that curve 8 must be re-evaluated again. Plausible if the applicant thinks that once curve 8 is assessed it is no longer required.

Provide Unit 2 Curve 8 to applicants. Do NOT provide Primary Containment Flowchart

EK2. Knowledge of the interrelations between HIGH DRYWELL TEMPERATURE and the following: (CFR: 41.7 / 45.8) EK2.01 †Drywell spray: Mark-I&II..... 3.7 / 4.1

1- bullet conditions

RFA Approved 10/23/2007
BLC updated distractor analysis only 11/20/07

Tier:	1	Group:	1
Keyword:	DW SPRAY	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

59. 295030EK1.01 016/1/1/TORUS LEVEL/BANK/HIGHER/HT2007-301/RO/BLC/RFA

An event has occurred on **Unit 2** resulting in the following conditions:

- 4160V Buses 2A and 2B are de-energized
- RPV Pressure..... 950 psig
- RPV Water Level..... 30 inches being controlled with CRD
- Torus Water Level....55 inches

Given these conditions, which ONE of the following systems is required to be used if the reactor must be emergency depressurized?

A. Safety relief valves

B. Bypass valves

C. RCIC in pressure control mode

D. HPCI in pressure control mode

A. Incorrect because torus level is < +57.5 " (IAW CP-1). Plausible because this is the normal system used to emergency depressurize. Also plausible if applicant does not know that alternate ED is required when torus level is less than +57.5".

B. Incorrect because the condenser is not available, i.e., BOP busses are de-energized. Plausible if applicant knows that torus level is < +57.5", i.e., alternate ED is required, but does not know that the heat sink is unavailable.

C. Correct IAW 31EO-EOP-108-2, Alternate Emergency Depressurization

D. Incorrect because PC flowchart (SP/L) directs locking out HPCI if torus level cannot be maintained > 110." Plausible if applicant knows that the main condenser is not available.

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) EK1.01 Steam condensation..... 3.8* / 4.1*

Reference
LOR Bank question: Media# LR-LP-20319, Objective # 039.033.A.02, Question #2

1- bullet conditions
2- To bullet proof add to C & D " in pressure control mode" (eliminates using drains)

RFA Approved 10/23/2007
BLC updated distractor analysis only 11/20/07

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Tier:	1	Group:	1
Keyword:	TORUS LEVEL	Source:	BANK
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

60. 295031G2.4.45 017/1/1/LOW LEVEL/NEW/FUND/HT2007-301/RO/BLC/RFA

Which ONE of the following annunciators being in an alarmed condition represents the lowest reactor water level on **Unit 1**?

A. **ARI LEVEL 1 OR 2 INITIATED** (603-301)

B. **REACTOR VESSEL LEVEL 2 DIVISION I TRIP** (603-205)

C. **REACTOR VESSEL LOW LEVEL TRIP** (603-108)

D. **RECIRC PMP A & B HI PRESS/LOW LVL TRIP** (602-120)

A. Incorrect because setpoint is -35". Plausible if applicant thinks that ARI initiates at level 1 as enscribed on the alarm window.

B. Incorrect because setpoint is -35". Plausible if applicant thinks that level 1 is lower than level 2.

C. Incorrect because setpoint is +3 ". Plausible if applicant does not know the alarm setpoint.

D. Correct because setpoint is -60"

EPE: 295031 Reactor Low Water Level
2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm. (CFR: 43.5 / 45.3 / 45.12)
IMPORTANCE 3.3 /3.6

References
34AR-603-108-1, Reactor Vessel Low Level Trip annunciator procedure
34AR-602-120-1, Recirc Pmp A&B Hi Press/Low Lvl Trip annunciator procedure
34AR-602-318-1, Auto Blowdown Relays Energized annunciator procedure
34AR-602-330-1, ADS Low Water Lvl Actu Timers Initiated annunciator procedure
34AR-603-141-1, Reactor Vessel Water Level High/Low annunciator procedure
34AR-603-205-1S, Reactor Vessel Level 2 Division I Trip annunciator procedure
34AR-603-218-1, Reactor Vessel Level 1 Div I Trip annunciator procedure
34AR-603-301-1, ARI Level 1 or 2 Initiated annunciator procedure
34AR-602-306-1, AUTO Blowdown Timers Initiated annunciator procedure

RFA Approved 10/23/2007

Tier:	1	Group:	1
Keyword:	LOW LEVEL	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

61. 295037EA1.07 019/1/1/RMCS/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Unit 2 is operating at 100% power when a scram signal occurs. Many control rods remain withdrawn after the reactor mode switch is placed in the shutdown position.

The following plant conditions currently exist:

- APRM power 24%
- RPV level 36"
- Reactor Mode Switch is in REFUEL
- The operator inadvertently skips a procedure step and the RWM is NOT bypassed
- The RWM is not in sequence control mode
- All other EOP procedure steps to prepare for driving control rods have been completed

Which ONE of the following choices identifies the rod movement switch(es) that will cause a control rod to insert if the operator selects and attempts to insert a peripheral control rod with an insert limit of 18?

Control rods can be inserted using _____.

When the control rod reaches a RWM insert limit, the control rod will _____.

A. the Emergency In switch ONLY

automatically stop moving

B. either the normal Rod Movement Control switch or the Emergency In switch

automatically stop moving

C. the Emergency In switch ONLY

continue moving in to the full in position

D. ✓ either the normal Rod Movement Control switch or the Emergency In switch

continue moving in to the full in position

Note: RWM low power setpoint at 21% APRM power on U2 (20.6% on U1). RWM low power alarm point is 26% on U2 (25.6% on U1).

A. Incorrect because the Normal In switch will also work since RWM is above the low power setpoint. Also incorrect because the control rod will not stop moving at position 18. Plausible if the applicant thinks that the Normal In switch will not work with the mode switch in the refuel position.

B. Incorrect because the rod will continue to insert past the insert limit since RWM is above the low power setpoint. Plausible if applicant does not know the RWM low power setpoint (21%) and assumes the low power alarm point (26%) will block movement.

C. Incorrect because the Normal Rod Movement Control Switch insert position will still work since RWM is not enforcing blocks. Plausible if applicant thinks that the Normal Rod movement Control switch is inhibited with the mode switch in refuel.

D. Correct.

EA1. Ability to operate and/or monitor the following as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: (CFR: 41.7 / 45.6) EA1.07 RMCS: Plant-Specific..... 3.9 / 4.0

References
34AB-C71-001-1/2, Scram Procedure
31EO-EOP-103-1, EOP Control Rod Insertion Methods

Why do plant procedures require the mode switch in refuel?

Plausibilty of question stem - At Hatch, by the time procedural actions to insert rods are started, power will be lower than 40%. Changed 40% power to 24% power. This is in between the RWM LPSP and LPAP.
1- Bullet conditions
2- Change RONOR to Normal Rod Movement Control Switch. The Emergency In positon is one of the positions of the RONOR switch.
3- Changed 40% power to 24% power. THis is in between the RWM LPSP and LPAP.
4- To bullet proof added "because the Mode Switch is in SHUTDOWN." to A and "because RWM is enforcing a Rod Block" to B & C. There may be other reasons that the actions would not happen that have not been considered or elliminatedin the stem. The question is just as challenging, but now the applicant knows exactly what we are asking.
5.To bullet proof and increase stem focus, Add "based on system design, NOT procedural limits" to end of question.

RFA Approved 10/23/2007
BLC updated distractor analysis and added noun name to normal switch, i.e., "rod movement control switch" 11/20/07

Tier:	1	Group:	1
Keyword:	RMCS	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

62. 295038EK1.03 019/1/1/RELEASE/NEW/FUND/HT2007-301/RO/BLC/RFA

A plant event occurred and an alert has been declared by the shift manager. 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.

While the control operator is gathering the TRN-0052 meteorological data, he notes that the 100 meter wind speed data from the primary meteorological tower is 40 mph at 90°.

Which ONE of the following describes the release point being assessed and the wind direction?

A. 100 meters is a primary data point used for an ELEVATED RELEASE
90° means that the wind is blowing towards the east

B. 100 meters is a primary data point used for an ELEVATED RELEASE
90° means that winds are coming from the east

C. 100 meters is a primary data point for a GROUND RELEASE
90° means that the wind is blowing towards the east

D. 100 meters is a primary data point for a GROUND RELEASE
90° means that winds are coming from the east

Note: 0° = 360°= North;
90° = East;
180° = 540° = South
270° = West

100 meters is elevated; 10 meters is ground

A. Incorrect because wind direction is always cited "from". Plausible if applicant thinks that wind direction is cited as blowing towards.

B. Correct.

C. Incorrect because 100 meters is elevated. Also incorrect because wind direction is always cited "from". Plausible if applicant does not know the met tower elevations listed on the MIDAS Input Data Acquistion chart and does not know that wind direction is always cited "from."

D. ncorrect because 100 meters is elevated. Plausible if applicant does not know the met tower elevations listed on the MIDAS Input Data Acquistion chart.

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 will be used by the Shift Manager to determine the correct evacuation route.

References
LR-LP-20017, Offsite Dose Assessment lesson plan
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

1- Change answer to B (wind direction meter reads in direction from, not towards)

RFA Approved 10/23/2007
BLC updated distractor analysis only 11/20/07

Tier:	1	Group:	1
Keyword:	RELEASE	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

63. 300000K4.02 001/2/1/AIR/NEW/FUND/HT2007-301/RO/BLC/RFA

Which ONE of the following describes when a nitrogen pneumatic supply is automatically provided to the Non-interruptible essential air loads on **Unit 1**?

A. Only one pneumatically operated valve auto-opens at 80 psig.

B. Only one motor operated valve auto-opens at 80 psig.

C. Five pneumatically operated valves open. Four valves auto-open at 90 psig and one valve auto-opens at 80 psig.

D. Five motor operated valves open. Four valves auto-open at 90 psig and one valve auto-opens at 80 psig.

A. Incorrect because on Unit 1 there are five motor operated valves. Plausible because there is only one valve on Unit 2.

B. Incorrect because on Unit 1 there are five motor operated valves. Plausible because there is only one motor operated valve on Unit 2.

C. Incorrect because there are five MOTOR operated valves. Plausible if applicant knows that the majority of air isolation valves are pneumatically operated.

D. Correct.

K4. Knowledge of (INSTRUMENT AIR SYSTEM) design feature(s) and or interlocks which provide for the following: (CFR: 41.7)
K4.02 Cross-over to other air systems . . . . . 3.0 / 3.0

References
P51-P52-P70-PLANT AIR-LP-03501, Plant Air Systems lesson plan
34SO-P51-002-1, Unit 1 Instrument & Service Air Electrical Lineup (Attach 1, pg 2 of 5)
34SO-P51-002-2, Unit 2 Instrument & Service Air Electrical Lineup (Attach 1, pg 3 of 3)

RFA Approved 10/23/2007

Tier:	2	Group:	1
Keyword:	AIR	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

64. 400000K3.01 001/2/1/RBCCW/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Unit 1 is at 100% power with the "A" and "C" RBCCW pumps in service. The "B" RBCCW pump is out of service for maintenance. All other systems are in their normal alignment.

Which ONE of the following will occur if the 600VAC Bus D trips and locks out due to an electrical fault?

A. Recirc MG set oil temperatures will rise.
Fuel Pool temperature will rise.

B. Recirc MG set oil temperatures will rise.
Fuel Pool temperature will remain the same.

C. Recirc MG set oil temperatures will remain the same.
Fuel Pool temperature will rise.

D. Recirc MG set oil temperatures will remain the same.
Fuel Pool temperature will remain the same.

Note:
Recirc MG set lube oil cooler is cooled by RBCCW
Fuel Pool Cooling heat exchangers are cooled by RBCCW
"A" & "C" RBCCW pumps are powered from 600 VAC Emergency Bus "C"
"B" RBCCW pump is powered from 600 VAC Emergency Bus "D"
Fuel Pool Cooling pumps are not powered from emergency busses. (1R24-S015
Recirc Pump MG set lube oil pumps are not powered from emergency busses.

A. Incorrect because the running RBCCW pumps are unaffected. Plausible if applicant thinks that one of the RBCCW pumps tripped or one of the Recirc MG set lube oil pumps tripped. Also Plausible if applicant does not know that the fuel pool cooling pump is powered from 1R24-S015, not 1R24-S012.

B. Incorrect because the running RBCCW pumps are unaffected. Plausible if applicant thinks that one of the Recirc MG set lube oil pumps tripped.

C. Incorrect because fuel pool temp will remain the same. Plausible if applicant does not know that the fuel pool cooling pump is powered from 1R24-S015, not 1R24-S012.

D. Correct.

K3. Knowledge of the effect that a loss or malfunction of the CCWS will have on the following: (CFR: 41.7 / 45.6) K3.01 Loads cooled by CCWS . . . . . 2.9 / 3.3

References
P64-PCCCW-LP-01304, Primary Containment Cooling & Chilled Water lesson plan
P42-RBCCW-LP-00901, RBCCW lesson plan

May be double jeopardy with Q #49
1-Change "Drywell" temperature will rise or remain the same to "Fuel Pool" for each distractor. (As written C is the correct answer because 2 drywell cooling fans will be lost based on 34SO-T47-001-1, Drywell Cooling System. The normal line-up has both fans running on 1T47-B008A and B. One fan on each cooling unit is powered indirectly (S012) from 600D. Since PSW supplies the coolers, makes the determining factor for answer not tied to KA.) Fuel pool temperature is plausible since the FPC HX is cooled by RBCCW. A Temp increase is incorrect because it is fed from 1R24-S015, Not 1R24-S012.
2- Updated plausibility statements

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Tier:	2	Group:	1
Keyword:	RBCCW	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

65. 600000AK2.01 020/1/1/FIRE/NEW/FUND/HT2007-301/RO/BLC/RFA

The Unit 1 reactor operator receives a fire alarm annunciator (651-160). The following line is observed on the control room CRT 1Z43-R404CX:

1T43087D02 E Torus Wtr Curtain Alarm

Assuming this area is the 87' elevation, which ONE (1) of the following identifies whether sprinkler flow will occur in this area and if the fire brigade is required to be dispatched in accordance with the Fire Alarm ARP?

	Sprinkler Flow	Action Required
A.	Sprinkler flow will occur even if a heat source does not exist.	Fire Brigade is NOT immediately dispatched.
B.	Sprinkler flow occurs ONLY with a heat source.	Immediately dispatch the Fire Brigade before confirming a fire.
C.	Sprinkler flow will occur even if a heat source does not exist.	Immediately dispatch the Fire Brigade before confirming a fire.
D.	Sprinkler flow occurs ONLY with a heat source.	Fire Brigade is NOT immediately dispatched.

A. Incorrect because this area is a wet pipe sprinkler system. Plausible if applicant thinks this area is a fixed water spray or deluge system.

B. Incorrect because fire alarm annunciator procedure requires verifying fire first before dispatching brigade. Plausible if applicant does not know annunciator procedure actions.

C. Incorrect because this area is a wet pipe sprinkler system. Also incorrect because fire alarm annunciator procedure requires verifying fire first before dispatching brigade. Plausible if applicant thinks this area is a fixed water spray or deluge system and reasons that this is a valid alarm.

D. Correct

AK2. Knowledge of the interrelations between PLANT FIRE ON SITE and the following: AK2.01 Sensors / detectors and valves . . . . . 2.6 / 2.7

References:
34SO-Z43-003-1S, Operation of the Fire Detection Command Center
34AR-651-160-1, Fire Alarm annunciator procedure
X43-FPS-LP-03601, Fire Protection lesson plan
34AB-X43-001-1, Fire Procedure AOP
Unit 1 TRM, Fire Protection Appendix , Table 1.2-1, page 9.2-B-14

1- Question requires too much detailed memory of the location of the different types of fire systems in the plant, the actuation requirements of the system and the actions to take. It took an extended period of time to look the right answer up with all references available. Replace question - See replacement

Used original with minor edits
re-evaluate after re-validation

RFA Approved 10/24/2007

Tier:	1	Group:	1
Keyword:	FIRE	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

66. G2.1.2 001/3/1/CONDUCT OPS/NEW/FUND/HT2007-301/RO/

Which ONE of the following identifies when a paper copy of 34SV-SUV-019-1/2, Surveillance Checks, is required to be used instead of the computerized rounds software?

A. If more than one operator is collecting the data

B. If the order of station readings will be altered

C. If a mode change will occur

D. If an abnormal or out of spec reading is collected

A. Incorrect because 34SV-SUV-019-2, Section 4.3.16 allows for more than one operator provided they each log into the computer or information is placed in the Notes section that identifies the other operator who collected the data. Plausible if applicant thinks that the computer does not allow more than one operator to collect data; therefore, a paper copy is required.

B. Incorrect because 34SV-SUV-019-2, Attachment 4 states that due to the nature and limitations of computerizing a procedure, the tour will NOT be an exact match with the written procedure. Plausible if applicant thinks that the computer tour will not allow "skipping ahead" with readings, etc.

C. Correct. (34SV-SUV-019-2, Section 4.3.17)

D. Incorrect because 34SV-SUV-019-2, Attachment 3 (Computerized Surveillance Documentation) requires that all abnormal readings have a note entered. Plausible if applicant thinks that computerized tour does not allow for out of spec readings.

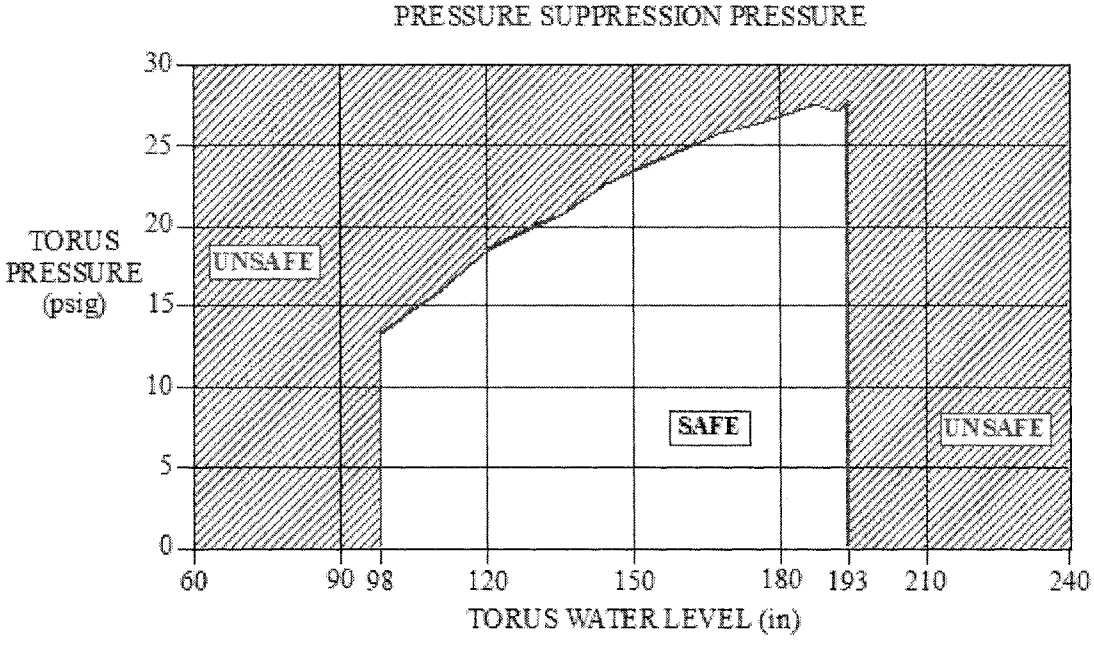
2.1 Conduct of Operations
2.1.2 **Knowledge of operator responsibilities during all modes of plant operation.** (CFR: 41.10 / 45.13)
IMPORTANCE RO 3.0 / SRO 4.0

References
34SV-SUV-019-2, Surveillance Checks

RFA Approved 10/24/2007

Tier:	3	Group:	1
Keyword:	CONDUCT OPS	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	

67. G2.1.25 001/3/1/GRAPH/NEW/FUND/HT2007-301/RO/BLC/RFA



Which ONE of the following components corresponds to the torus water level limit of 193" in graph 7, Pressure Suppression Pressure?

A. Top of the torus-to-drywell vacuum breakers

B. Bottom of torus ring header

C. Control room torus water level indicator is at the top of the band

D. Control room torus pressure instrument tap becomes covered

A. Incorrect because torus-to-drywell vacuum breakers are submerged at 197.5 ". Plausible because these vacuum breakers are in the suppression pool range being considered.

B. Correct.

C. Incorrect because the highest control room torus level instrument indication is 300." Plausible because the x-axis deals with torus level.

D. Incorrect because the level @ which the torus pressure instrument tap is covered is 40 feet . Plausible since the y-axis deals with torus pressure.

2.1 Conduct of Operations
2.1.25 **Ability to obtain and interpret station reference materials such as graphs / monographs / and tables which contain performance data.** (CFR: 41.10 / 43.5 / 45.12) IMPORTANCE RO 2.8 / SRO 3.1

References
31EO-OPS-001-0, EOP General Information

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Tier:	3	Group:	1
Keyword:	GRAPH	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

68. G2.2.11 001/3/2/TEMP MOD/NEW/FUND/HT2007-301/RO/BLC/RFA

Temporary Modification Tag

Temporary Modification No. _____ Tag No. _____

Name of Person
Attaching Tag _____ Date _____

Affected Component/System _____

_____

_____

Connection Point(s)_____

705981 H1

Which ONE of the following component changes requires this tag to be hung in accordance with 40AC-ENG-018-0, Temporary Modification Control?

A. An annunciator card that has been pulled to disable an alarm.

B. An additional breaker is added to a local electrical panel to supply power to a temporary welding machine.

C. A hose is temporarily routed from a plant service air connection to a pneumatic diaphragm pump.

D. A hose is temporarily routed from a drain line on a pipe for a local leak rate test.

A. Incorrect because 40AC-ENG-018-0, Attachment 3 states that pulled annunciator cards are an exception to temp mods. Plausible if applicant knows that pulled circuit cards are listed in Attachment 3 as an example of a temp mod.

B. Correct (40AC-ENG-018-0, Attachment 3)

C. Incorrect because hoses used to provide supply air for portable pneumatic equipment are specifically identified as NOT being examples of temp mods.

D. Incorrect because hoses routed for LLRTs are specifically identified as NOT being examples of a temp mod (because they're performed in accordance with an approved procedure). Plausible if applicant confuses this with temporary equipment being tied into permanent plant equipment, which IS a temp mod.

2.2 Equipment Control
2.2.11 **Knowledge of the process for controlling temporary changes.** (CFR: 41.10 / 43.3 / 45.13)
IMPORTANCE RO 2.5 / SRO 3.4 *

References
40AC-ENG-018-0, Temporary Modification Control, Attachment 3: Examples of TMs and Non-TMs

1- Change B to read "A breaker is added to a local electrical panel to supply power for a welding machine." (Ensures applicant knows a new power supply is being introduced, Not just plugging in a welder.)
2- Change sandpiper to "pneumatic diaphram pump" (terminology more familiar to plant)

RFA Approved 10/24/2007

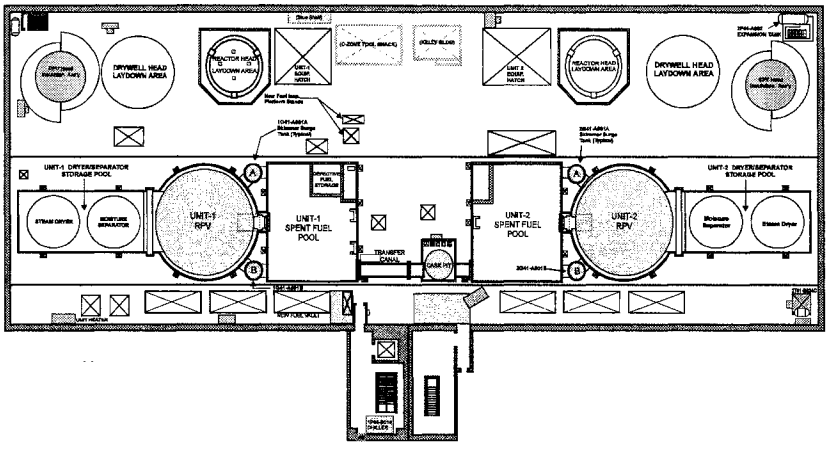
Tier:	3	Group:	2
Keyword:	TEMP MOD	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

69. G2.2.27 001/3/2/REFUELING/BANK-MODIFIED/FUND/HT2007-301/RO/BLC/RFA

An operator on the **Unit 2** Bridge observes two fuel bundles in the normal fuel storage section of the **Unit 2** fuel pool.

Bundle 1's channel fastener is pointed in the direction between the **Unit 1** reactor and **Unit 1** CST.

Bundle 2's channel fastener is pointed in the direction between the **Unit 2** reactor and **Unit 2** CST.



Which ONE of the following describes the orientation of these two bundles in accordance with 34FH-OPS-001-0, Fuel Movement Operation?

A. Bundle 1 is oriented correctly.
Bundle 2 is oriented INCORRECTLY.

B. Bundle 1 is oriented INCORRECTLY.
Bundle 2 is oriented correctly.

C. Both bundles are oriented INCORRECTLY.

D. Both bundles are oriented correctly.

In accordance with 34FH-OPS-001, Section 4.3.5.1, "for spent pool locations, all fuel bundle orientations must be southwest."

Note: For this picture, the following items are true:
>>> Unit 1 is north of Unit 2
The Unit 1 CST is located in the northeast portion of the stem picture
The Unit 2 CST is located in the southeast portion of the stem picture
FH procedure requires all bundles in the spent fuel pools to be pointed to the southwest.

A. Incorrect because both bundles are pointed east. Plausible if applicant does not know the fuel handling procedure requirement or the plant orientation.

B. Incorrect because both bundles are pointed east. Plausible if applicant does not know the fuel handling procedure requirement or the plant orientation.

C. Correct.

D. Incorrect because both bundles are pointed east. Plausible if applicant does not know the fuel handling procedure requirement or the plant orientation.

2.2 Equipment Control
2.2.27 **Knowledge of the refueling process.** (CFR: 43.6 / 45.13) IMPORTANCE RO 2.6 / SRO 3.5

References
Initial Exam Bank item# F15-RF-LP-04502 300.044.A.01 34FH-OPS-001-0 00
34FH-OPS-001-0, Fuel Movement Operation, Sction 4.3.5

1- Bold Unit 2

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Tier:	3	Group:	2
Keyword:	REFUELING	Source:	BANK-MODIFIED
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

70. G2.2.4 001/3/2/RSDP/NEW/FUND/HT2007-301/RO/BLC/RFA

Which ONE of the following describes the unit differences for the Reactor Building Remote Shutdown Panel(s) (RSDP) emergency transfer switches?

With an emergency transfer switch in the _____ position for _____ , equipment can be operated from BOTH the MCR AND the RSDP.

A. NORM / Unit 2

B. EMER / Unit 1

C. NORM / Unit 1

D. EMER / Unit 2

Note: On U2, when the ETS is positioned to NORM, the equipment can ONLY be operated from the main control room. On U1, when the ETS is positioned to NORM, the equipment can be operated from EITHER the main control room OR remote shutdown panels. On BOTH units, when the ETS is in the EMERG position, the equipment can ONLY be operated at the remote shutdown panels.

A. Incorrect because U2 can only operate from the main control room in NORM. Plausible because this feature exists on Unit 1.

B. Incorrect because in EMERG, equipment can only be operated at the remote shutdown panel. Plausible if applicant does not know that the unique U1 feature does not work when the ETS is in the emergency position, i.e., only in normal.

C. Correct.

D. Incorrect because in EMERG, equipment can only be operated at the remote shutdown panel. Plausible if applicant does not know that the unique U1 feature does not work when the ETS is in the emergency position, i.e., only in normal.

2.2 Equipment Control
2.2.4 (multi-unit) **Ability to explain the variations in control board layouts / systems / instrumentation and procedural actions between units at a facility.** (CFR: 45.1-45.13) IMPORTANCE RO 2.8 / SRO 3.0*

References
C82-RSDP-LP-05201, Remote Shutdown Panel lesson plan, (page 23 of 93)

Replace - Recall too specific
Repalce with new question
New question more operationally oriented and important. An operator manipulating switches prior to going to EMER on Unit 2 will not operate equipment, while on Unit1 equipment would be operating. i.e. RCIC from RSDP lineup with RCIC operating or standby.

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BLC updated distractor analysis only 11/20/07

Tier:	3	Group:	2
Keyword:	RSDP	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

71. G2.3.10 001/3/3/RAD CTL/NEW/FUND/HT2007-301/RO/BLC/RFA

Unit 1 was initially operating at reduced power with one control rod inserted due to a leaking fuel bundle. Subsequently, the main steam line radiation levels began rising to a point where the crew was required to manually scram and manually close the group 1 isolation valves.

Given this plant condition, which ONE of the following describes the required action(s) in accordance with 34AB-B21-001-1, Main Steam Line High Rad or Suspected Fuel Element Failure?

A. Open the condenser vacuum breakers and then re-close vacuum breakers when vacuum reaches 3 " hg.

   The Main Control Room HVAC is required to be manually started in the pressurization mode.

B. Open the condenser vacuum breakers and then re-close vacuum breakers when vacuum reaches 3 " hg.

   The Main Control Room HVAC is NOT required to be manually placed in the pressurization mode.

C. Open the Main Condenser vacuum breaker valves WHEN Turbine speed is less than 1200 RPM OR steam seal pressure reaches 0 PSIG. Maintain the vacuum breakers open.

   The Main Control Room HVAC is required to be manually started in the pressurization mode.

D. Open the Main Condenser vacuum breaker valves WHEN Turbine speed is less than 1200 RPM OR steam seal pressure reaches 0 PSIG. Maintain the vacuum breakers open.

   The Main Control Room HVAC is NOT required to be manually placed in the pressurization mode.

Note: Normal operating practice is to leave condenser vacuum breakers open and close the MSIVs. Following fuel failure, the vacuum breakers are opened to partially break vacuum and then and re-closed to quarantine the failed fuel even though the MSIVs are closed.

A. Correct.

B. Incorrect because 34AB-B21-001-1, Step 4.15 requires CB HVAC in pressurization mode. Plausible if applicant knows the CR HVAC system is already running in the normal mode but does not know the procedure requires this system be shifted to the pressurization mode.

C. Incorrect because the condenser vacuum is required to be maintained at 3" hg IAW 34AB-B21-001-1, Step 4.2.4.3. Plausible if the applicant knows that the MSIVs are closed but does not know the 34AB-B21-001-1 mitigation strategy for confirmed fuel failure.

D. Incorrect because the condenser vacuum is required to be maintained at 3" hg IAW 34AB-B21-001-1, Step 4.2.4.3. Also incorrect because 34AB-B21-001-1, Step 4.15 requires CB HVAC in pressurization mode. Plausible if the applicant knows that the MSIVs are closed but does not know the 34AB-B21-001-1 mitigation strategy for confirmed fuel failure and if applicant does not know the procedure requirements and question does not state that any initiating conditions have occurred. Also plausible if applicant knows the CR HVAC system is already running in the normal mode but does not know the procedure requires this system be shifted to the pressurization mode.

2.3 Radiation Control
2.3.10 **Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.** (CFR: 43.4 / 45.10) IMPORTANCE RO 2.9 / SRO 3.3

References:
34AB-B21-001-1, Main Steam Line High Radiation Or Suspected Fuel Element Failure AOP
34AB-C71-001-1, Scram Procedure AOP

1- Bold Unit 1
2- Delete "in accordance with 40AC-ENG-014-0, Failed Fuel, Action Level 1". Adds length to stem without significant value. The applicant doesn't need to know the procedure that gives guidance for failed fuel action levels, just that it has failed and the actions have been taken, i.e. rod inserted.

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BLC updated distractor analysis only 11/20/07

Tier:	3	Group:	3
Keyword:	RAD CTL	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

72. G2.3.2 001/3/3/ALARA/BANK MOD/FUND/HT2007-301/RO/BLC/RFA

An new employee at Plant Hatch told the Health Physics (HP) personnel that he has an estimated dose of 1.5 rem Total Effective Dose Equivalent (TEDE) exposure for this year. The HP personnel have documented the estimate in the employees records.

Which ONE of the following is the maximum amount of time this employee can work in a 100 mr/hr general area field without exceeding the TEDE adminstrative limit in accordance with 60AC-HPX-001-0, Radiation Exposure Limits?

ASSUME NO EXTENSIONS ARE APPROVED

A. 2 hours

B. 4 hours

C. 5 hours

D. 10 hours

A. Incorrect because the employee still has 500 mr available before the Tier 1 annual administrative limit is reached. Plausible if applicant thinks that since does is only an estimate, then the employee is not allowed to work in radiation.

B. Incorrect because this is not the maximum amount of time (as the questions asks). Plausible if applicant thinks that the adminstrative limit is less than 2 R (versus less than or equal to).

C. Correct.

D. Incorrect because this will be 500 mr ABOVE the admin limit. Plausible if applicant thinks that the admin limit is one-half the federal limit of 5 rem.

2.3 Radiation Control
2.3.2 **Knowledge of facility ALARA program.** (CFR: 41.12 / 43.4 / 45.9 / 45.10)
IMPORTANCE RO 2.5 / SRO 2.9

References
60AC-HPX-001-0, Radiation Exposure Limits
LT-LP-LP30008, Radiation Control Administration and Implementation lesson plan
Initial Exam Bank Item LT-LP-999000 735/LT-LP-30008-00/LT-30008.001

1- Change RadCon to "Health Physics (HP)"

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Tier:	3	Group:	3
Keyword:	ALARA	Source:	BANK MOD
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

73. G2.4.29 001/3/4/E-PLAN/NEW/FUND/HT2007-301/RO/

An Emergency Classification has been declared on **Unit 1** due to a primary system leak.

Given the following prompt offsite dose results, which ONE of the following is the LOWEST dose rate that meets the criteria for "Release is Underway" in accordance with 73EP-EIP-018-0, Prompt Offsite Dose Assessment?

A. 1 E-3 mr/hr

B. 1 E-2 mr/hr

C. 5.7 E-2 mr/hr

D. 5.7 E-1 mr/hr

A. Incorrect because this is the normal release rate. Plausible if applicant does not know that .001 is normal or that 1.0E-3 corresponds to .001. 1.0E-3 is how this number is listed in 73EP-EIP-018-0

B. Correct. (.01 corresponds to a factor of 10 above normal)

C. Incorrect because procedure defines 0.01 as "release is underway." Plausible because 0.057 is currently the offsite release rate that corresponds to an NUE. It is also the Rad Level in 73EP-EIP-018-0 that states to Notify the ED for a classification evaluation.

D. Incorrect because procedure defines 0.01 as "release is underway." Plausible because 0.57 is the entry condition for the Rad Release path of the EOPs.

2.4 Emergency Procedures /Plan
2.4.29 **Knowledge of the emergency plan.** (CFR: 43.5 / 45.11) IMPORTANCE RO 2.6 / SRO 4.0

73EP-EIP-001-0, Emergency Classification and Initial Actions (new version)

1- Job Link as written not RO level
2- Replaced a question with a question that tests the candidates knowledge of radiation levels that correspond to release rates (from the Emergency Plan)
3- Changed Plausibility statements.

BLC / RFA Approved 10/24/2007
BLC updated distractor analysis only 11/20/07

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for RO Final Version 11.26.2007

Tier:	3	Group:	4
Keyword:	E-PLAN	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	

74. G2.4.45 001/3/4/ANNUNCIATOR/NEW/FUND/HT2007-301/RO/BLC/RFA

Which ONE of the following describes the meaning of a white plastic frame being installed on an annunciator at the Reactor / Containment Cooling and Isolation panel 2H11-P601?

The white plastic frame means that the annunciator:

A. is the result of some plant evolution that is both known and expected by the operating crew, i.e., expected alarm flag.

B. has been disabled, i.e., "card is pulled."

C. indicates an entry condition for 31EO-EOP-010-1, RC/RPV Control.

D. is an indicator of a potential radiological condition.

Note: The meaning of the white plastic frame is only defined in 73EP-EIP-018-0, Prompt Offsite Dose Assessment.

A. Incorrect because white outline is alarm with potential for being an indication of a radiological condition. Plausible since "expected" alarms are specifically identified too. (i.e., yellow flag)

B. Incorrect because white outline is alarm with potential for being an indication of a radiological condition. Plausible since disabled alarms are specifically identified too. (i.e., yellow magnet dot)

C. Incorrect because white outline is alarm with potential for being an indication of a radiological condition. Plausible since alarms associated with Secondary Containment Control Table 5 are also specifically identified too. (i.e., they have a label immediately adjacent to the annunciator, e.g., SC/L-1).

D. Correct.

2.4 Emergency Procedures /Plan
2.4.45 **Ability to prioritize and interpret the significance of each annunciator or alarm.**
(CFR: 43.5 / 45.3 / 45.12) IMPORTANCE RO 3.3 / SRO 3.6

References
73EP-EIP-018-0, Prompt Offsite Dose Assessment
31-GO-OPS-014-0, Annunciator and Plant Component Control
34AB-T22-003-1, Attachment 8
DI-OPS-59-0896, Operations Mgmt Expectations, Section 5.7

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1- To bullet proof add "on the 2H11-P601 panel" to stem. Our scram signal annunciators on the 603 panel also have a white box. Also, add "pecific parameter point in tables 4 thru 6" in C. Because some of the white box alarms are caused by the conditions requiring entry into the SC flowchart.

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Tier:	3	Group:	4
Keyword:	ANNUNCIATOR	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

75. G2.4.7 001/3/4/EOP/NEW/FUND/HT2007-301/RO/BLC/RFA

Which ONE of the following describes a condition where a plant parameter is approaching a value that warrants rapidly depressurizing the RPV to the main condenser using the bypass valves, irrespective of the cooldown rate, including the basis for this action?

A. Reactor water level decreasing due to a loss of high pressure injection (still > TAF)
Basis: Preserves the heat capacity of the torus for as long as possible.

B. Reactor water level decreasing due to a loss of high pressure injection (still > TAF)
Basis: Maintains the level instruments with reference legs inside containment operable.

C. Drywell temperature increasing due to the inability to spray the drywell. (still < 340)
Basis: Preserves the heat capacity of the torus for as long as possible.

D. Drywell temperature increasing due to the inability to spray the drywell. (still < 340)
Basis: Maintains the level instruments with reference legs inside containment operable.

A. Incorrect because the reason for emergency depressurizing to the main condenser cannot be due to water level decreasing due to a loss of high pressure feed. (steaming off inventory without any feedwater injection, resuling in quickly reaching TAF.) Plausible since ED is required if level reaches TAF and low pressure injection systems is available.

B. Incorrect because the reason for emergency depressurizing to the main condenser cannot be due to water level decreasing due to a loss of high pressure feed. (steaming off inventory without any feedwater injection, resuling in quickly reaching TAF.) Also incorrect because the basis for anticipating emergency depressurization is to avoid adding heat to the torus. Plausible since the applicant may correlate containment heatup with reference leg flashing.

C. Correct.

D. Incorrect because the basis for anticipating emergency depressurization is to avoid adding heat to the torus. Plausible since the applicant may correlate containment heatup with reference leg flashing

2.4 Emergency Procedures /Plan
2.4.7 **Knowledge of event based EOP mitigation strategies.** (CFR: 41.10 / 43.5 / 45.13)
IMPORTANCE RO 3.1 / SRO 3.8

References
EOP-RC-LP-20308, RPV Control (Non-ATWS) lesson plan

QUESTIONS REPORT
for RO Final Version 11.26.2007

1- Change rapidly depressurizing the RPV to the Main Condenser to "Anticipating Emergency Depressurization"

NO Change Keep original

RFA 10/24/2007

Tier:	3	Group:	4
Keyword:	EOP	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

76. 201003A2.05 001/2/2/CRDM/NEW/HIGHER/HT2007-301/SRO/BLC/RFA

Unit 2 is at 100% power. The following conditions exist:

- Three WITHDRAWN control rod scram accumulators are depressurized.
- 2C11-R601, Chg Wtr Press indicator, is reading 800 psig and decreasing
- A manual reactor scram was performed

Which ONE of the following predicts how these three CRD mechanisms are affected by the scram and identifies the procedure that required the manual scram?

(Assume NO additional manual operator actions.)

A. Reactor pressure WILL cause the CRDM internal ball valve to shift.

34AB-C11-001-2, Loss of CRD System

B. Full-in (green) lights on the full core display will NOT illuminate.

34AB-C11-001-2, Loss of CRD System

C. Reactor pressure WILL cause the CRDM internal ball valve to shift.

34AB-C11-003-2, Inability to Move a Control Rod

D. Full-in (green) lights on the full core display will NOT illuminate.

34AB-C11-003-2, Inability to Move a Control Rod

Updated 11/19/07 RSG

A. Correct

B. First statement is incorrect because rods will fully insert and full-in lights will illuminate, but is plausible if applicants believes there is insufficient pressure to insert rods fully. Second statement is correct.

C. Incorrect because 34AB-C11-001-2 requires the scram for loss of CRD, but is plausible if applicant believes low charging water pressure will result in inability to move rods. First statement is correct.

D. First statement is incorrect because rods will fully insert and full-in lights will illuminate, but is plausible if applicants believes there is insufficient pressure to insert rods fully. Second statement is incorrect because 34AB-C11-001-2 requires the scram for loss of CRD, but is plausible if applicant believes low charging water pressure will result in inability to move rods.

QUESTIONS REPORT
for SRO Final Version 11.26.2007

A2. Ability to (a) predict the impacts of the following on the CONTROL ROD AND DRIVE MECHANISM ; 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) A2.05 Reactor Scram . . . . . 4.1* / 4.1

SRO-only (tie to 10CFR55.43(5): Assessment of facility conditions and selection of appropriatae procedures during norrmal, abnormal, and emergency situations.

References
C11-CRDM-LP-00102, Control Rod Drive Mechanism lesson plan
34AB-C11-001-1/2

Replace question.

KA match . Predictions regarding ball valve are not used to select correct procedure and control consequences.

Also requires memory of specific steps specified in SD procedure section that has not been used at used at Hatch for several years and is therefore considered too detailed for memory by a new operator.

Two correct answers. Distracter "B" could be viewed as correct based on 1) the standard for "preferred" is not defined, and 2) entry conditions for scram procedure are met and actions for bypassing the trip and resetting scram are contained in scram procedure

RFA approved 10/24/2007
(version approved was after further edits in NRC office during exam review)

Tier:	2	Group:	2
Keyword:	CRDM	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

77. 204000G2.1.2 001/2/2/RWCU/BANK-MOD/HIGHER/HT2007-301/SRO/BLC/RFA

A leak has developed on the RWCU system. The following conditions currently exist on **Unit 2** at rated conditions:

RWCU HX room ambient temperature (N016C)	195° F
RWCU HX room ambient temperature (N016D)	195° F
RWCU HX room differential temperature (N022C/N023C)	105°F ΔT
RWCU HX room differential temperature (N022D/N023D)	105°F ΔT
158' elevation south east area (2D21-K601B)	1100mR/Hr

Based on these current plant conditions, which ONE of the following choices describes the required operator actions in accordance with the Secondary Containment Control?

[Reference provided]

A. A reactor shutdown per 34GO-OPS-013 or 34GO-OPS-014 is required; however, an immediate reactor scram is currently NOT required.

B. An immediate reactor scram is required.
Emergency depressurization is NOT required.

C. An immediate reactor scram is required.
Emergency depressurization is required.

D. A reactor shutdown is currently NOT required.
Operate the HVAC per 34SO-T41-005 and attempt to isolate the RWCU leak.

Applicant Reference: Provide ONLY Table 4 and Table 6 from SC flowchart. Do NOT provide the flowchart to the applicant as a reference.

A. Incorrect because a primary system is discharging into secondary containment and the differential temperature and area radiation level is greater than max safe. These conditions require an immediate reactor scram. Plausible if the applicant knows that a reactor shutdown is required when an area is above max safe and the leak is NOT a primary system.

B. Correct.

C. Incorrect because an emergency depressurization is not required. Plausible since the applicant may not know that the two area temps (or two ambient temps) are in the same area (and therefore do not meet the intent of two areas above max safe.)

D. Incorrect because ventilation systems should NOT be operated when a secondary containment radiation condition exists. Also incorrect because a reactor scram is required based on a primary system discharging with one area differential temperature above max safe. Plausible if applicant interprets the differential temperature as an ambient temperature.

This question is SRO only because it is tied to 10CFR55.43(5).

2.1.2 Knowledge of operator responsibilities during all modes of plant oper of operator responsibilities during all modes of plant operation. (CFR: 41.10 / 45.13) IMPORTANCE 3.0 / 4.0

References
31EO-EOP-014-2, Secondary Containment Control Flowchart

Add "on **Unit 2** at rated conditions" to stem at the end of first sentence.
Cap "NOT" in A, B and D

RFA approved 10/24/2007

Tier:	2	Group:	2
Keyword:	RWCU	Source:	BANK-MOD
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

78. 211000G2.1.14 002/2/1/E-PLAN/NEW/HIGHER/HT2007-301/SRO/BLC/RFA

A transient has occurred involving a failure to scram (ATWS) that requires Standby Liquid Control (SLC) intiation per the emergency operating procedure guidance.

Based on this status, which ONE of the following identifies the required personnel notifications in accordance with 73EP-EIP-004-0, Duties of Emergency Director?

A. Dismissal of non-essential personnel from the plant site is mandatory.

   Notification of protective action recommendations (PARS) to state and local authorities is NOT mandatory for these conditions.

B. Dismissal of non-essential personnel from the plant site is mandatory.

   Notification of protective action recommendations (PARS) to state and local authorities IS mandatory for these conditions.

C. Dismissal of non-essential personnel from the plant site is NOT mandatory.

   Staff augmentation MUST be performed if the emergency event is occurring outside of normal working hours, on the weekend, or on a holiday by activating the HNP Autodialer System in the control room.

D. Dismissal of non-essential personnel from the plant site is NOT mandatory.

   The emergency response facilities (ERFs) MUST be activated.

A. Correct.

B. Incorrect because these conditions represent a site area classification, **(new E-Plan classification is SS2)** which does not necessarily require a mandatory PAR. Plausible if applicant thinks that this is a general emergency classification.

C. Incorrect because a site evacuation is required (73EP-EIP-004-0, Step 7.4.11). Plausible if applicant thinks that this is an Alert classification.

D. Incorrect because a site evacuation is required (73EP-EIP-004-0, Step 7.4.11). Plausible if the applicant thinks that this is an Alert classification.

SRO only based on 10CFR55.43 (5): assessment of facility conditions and selection of procedures
Do NOT provide any references for this question.

SYSTEM: 211000 Standby Liquid Control System
2.1.14 Knowledge of system status criteria which require the notification of plant personnel. (CFR: 43.5 / 45.12)
IMPORTANCE 2.5 / 3.3

References
DRAFT 73EP-EIP-001-0, Emergency Classification and Initial Actions
73EP-EIP-004-0, Duties of Emergency Director

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for SRO Final Version 11.26.2007

RFA approved 10/24/2007

Tier:	2	Group:	1
Keyword:	E-PLAN	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

79. 212000A2.20 001/2/1/RPS/NEW/HIGHER/HT2007-301/SRO/BLC/RFA

During an outage, maintenance is in progress on seven hydraulic control units (HCUs) to replace the scram valve diaphrams. The following conditions currently exist:

Mode switch: REFUEL position, all rods inserted
Discharge volume isolation test switch: ISOLATE position, under clearance
Scram discharge volume high level bypass switch: NORMAL position

Due to a clearance error, one of the HCUs begins to slowly fill the discharge volume as the mechanics begin working and the following alarm is received:

SCRAM DISCH VOL NOT DRAINED (603-119)

Which ONE of the following describes the operation of the RPS logic and if an active Technical Specification required action statement (RAS) must be entered for the high level bypass switch?

Assume the scram discharge volume continues to fill
Do not consider a tracking RAS

[Reference provided]

A. Placing the high level bypass switch in the BYPASS position at this time will PREVENT a scram.

   Using the keylock bypass at this time does NOT require entering an RAS action.

B. Placing the high level bypass switch in the BYPASS position at this time will PREVENT a scram.

   Using the keylock bypass at this time requires entering an RAS action.

C. Placing the high level bypass switch in the BYPASS position at this time will NOT PREVENT a scram because of the current Reactor Mode Switch position.

   Using the keylock bypass at this time does NOT require entering an RAS action.

D. Placing the high level bypass switch in the BYPASS position at this time will NOT PREVENT a scram because of the current Reactor Mode Switch position.

   Using the keylock bypass at this time requires entering an RAS action.

Applicant Reference: Provide Unit 2 Tech Spec Section 3.3.1.1 RPS Instrumentation (entire section). Do NOT provide Tech Spec Bases.

Updated 11/19/07 RSG

A. Correct.

B. Incorrect because SDV high level trip is not required by TS for Mode 5 with all rods inserted, but is plausible if applicant does not recognize all rods are inserted or that the trip is only required when any rod is withdrawn from a fueled cell as specified in footnote. First sentence is correct.

C. Incorrect because the bypass switch will work when the mode switch is in Refuel (or shutdown, but is plausible if applicant doesn't know that the bypass switch also works when the mode swtich is in the refuel position (versus only the shutdown position). Second sentence is true.

D. Incorrect because the bypass switch will work when the mode switch is in Refuel (or shutdown, but is plausible if applicant doesn't know that the bypass switch also works when the mode swtich is in the refuel position (versus only the shutdown position). Second sentence is incorrect because SDV high level trip is not required by TS for Mode 5 with all rods inserted, but is plausible if applicant does not recognize all rods are inserted or that the trip is only required when any rod is withdrawn from a fueled cell as specified in footnote.

Provide reference - Unit 2 Tech Spec section 3.3.1.1 RPS Instrumentation (entire section) NO Basis

SRO only because of A2 K&A and 10CFR55.43 (2): Facility operating limitations in the technical specfications and their bases.

A2. Ability to (a) predic
t 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) A2.20 Full system activation (full-SCRAM) . . 4.1*/ 4.2*

References
34AR-603-119-1, Scram Disch Vol Not Drained annunciator procedure
34AR-603-101-1, Scram Disch Vol High Level Trip alarm procedure
34AR-603-110-1, Scram Disch Vol High Level Trip Bypass alarm procedure
Tech Spec 3.3.1.1, RPS Instrumentation

Recall required is too specific for closed reference. Tests memory of a 3 page TS table for LCO.

Change LCO to RAS
Use question as written and provide tech spec section 3.3.1.1 entire section - no basis

BLC approved 10/24/2007

QUESTIONS REPORT

for SRO Final Version 11.26.2007

Tier:	2	Group:	1
Keyword:	RPS	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

80. 215004A2.02 003/2/1/REFUEL/NEW/HIGHER/HT2007-301/SRO/BLC/RFA

Unit 2 is in a Refueling outage with the following conditions:

- Core reload is in progress with the bridge over the Spent Fuel Pool
- SRM "A" is inoperable and bypassed
- SRM "B" drawer mode switch is in Standby

Which ONE of the following identifies the Reactor Manual Control System status and the Technical Specification limitations?

A rod out block _____ exist.

Fuel movement is _____.

[Reference provided]

A. does / allowed in northwest and southwest quadrants

B. does NOT / allowed in northwest and southwest quadrants

C. does / not allowed in any quadrant

D. does NOT / not allowed in any quadrant

Applicant Reference: Provide Unit 1 and Unit 2 core maps from 34FH-OPS-001-0, Attachment 6 & 7. Do NOT provide tech specs.

Updated 11/19/07 RSG
A. Correct.

B. Incorrect because rod block will occur but plausible if applicant does not know impact of SRM inop. The second part concenring TS limits is true.

C. Incorrect because TS allows fuel movement in quadrants with operable SRM as long as adjacent quadrant has operable SRM. Plausible if applicant does not know TS requirement or incorrectly determines which quadrants have operable SRM's. First part is correct since a rod out block does exist due to SRM B mode switch out of operate giving an inop rod block.

D. Incorrect because TS allows fuel movement in quadrants with operable SRM as long as adjacent quadrant has operable SRM. Plausible if applicant does not know TS requirement or incorrectly determines which quadrants have operable SRM's. Also plausible if applicant does not know impact of SRM inop on rod block.

QUESTIONS REPORT
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Provide reference - Unit 1 and Unit 2 Core Maps from 34FH-OPS-001-2, Attachment 6 and 7, version 21.16

SRO only because this is linked to 10CFR55.43(6): Procedures and limitations involved in intial core loading, alterations in core configuration, control rod programming, and determination of various internal and external effects on core reactivity. Also linked to Tech specs 3.3.1.2

A2. Ability to (a) predict the impacts of the following on the SOURCE RANGE MONITOR (SRM) 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) A2.02 SRM inop condition . . . . . 3.4 / 3.7

References:
C51-SRM-LP-01201, SRM lesson plan
TS 3.3.1.2, SRM Instrumentation
34AR-603-222, SRM Detector Retracted When Not Permitted annunciator procedure
34AR-603-238, Rod Out Block annunciator procedure
F15-RF-LP-04502, Refueling

1- Provide reference: Unit 2 core map in 34FH-OPS-001-0
2- Level of detail from memory beyond knowledge needed for new SRO due to different detectors in same relative quadrant for the two units and tech specs.
3- Reformat to bulleted format and add specific Unit (2)

RFA approved 11/7/07

Tier:	2	Group:	1
Keyword:	REFUEL	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

81. 245000A2.07 001/2/2/EHC/NEW/HIGHER/HT2007-301/SRO/BLC/RFA

Due to a slowly degrading condenser vacuum leak on **Unit 1**, the control room crew has reduced reactor power from rated power over the last several hours. Current plant conditions are:

- 285 MW(e)
- Condenser vacuum at 25.0 "Hg and steady

The SRO is evaluating whether the current power configuration will facilitate a manual turbine trip while maintaining the reactor critical.

Which ONE of the following predicts the plant response if the turbine is manually tripped at this power, including the required procedure to be implemented after the turbine is manually tripped?

A. Steam flow will be within the capacity of the bypass valves.
Enter 34GO-OPS-005-1, Power Changes, to adjust reactor power if necessary after the turbine is manually tripped.

B. Steam flow will be within the capacity of the bypass valves.
Enter 34GO-OPS-013-1, Normal Plant Shutdown

C✓ Steam flow will NOT be within the capacity of the bypass valves.
Enter 34AB-C71-001-1, Scram Procedure

D. Steam flow will NOT be within the capacity of the bypass valves.
Enter 34GO-OPS-005-1, Power Changes, after the turbine is tripped to lower reactor power.

A. Incorrect because 285 MW(e) is more than 25% rated steam flow (bypass capacity). 285 MW(e) is also above the first stage turbine pressure bypass point (27.6% power = 260 MW(e). Also incorrect because 34GO-OPS-005-1 is only used when reactor power level is greater than 35%. Plausible if applicant doesn't know rated electrical on Unit 1 (~ 915 MW(e)

B. Incorrect because 285 MW(e) is more than 25% rated steam flow (bypass capacity). 285 MW(e) is also above the first stage turbine pressure bypass point (27.6% power = 260 MW(e). Plausible if applicant doesn't know rated electrical on Unit 1 (~ 915 MW(e)

C. Correct.

D. Incorrect because 34GO-OPS-005-1 is only used when reactor power level is greater than 35%. Plausible if the applicant thinks that the RPS turbine trip will be bypassed but forgets that the Reactor High Pressure scram will cause a scram. Plausible if applicant reasons that this procedure was previously being used during the preceding power reduction(s).

SRO-only due to link to 10CFR55.43 (5): Assessment of plant conditions and selection of appropriate procedures.

A2. Ability to (a) predict the impacts of the following on the MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS ; 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) A2.07 Loss of reactor/turbine pressure control system: Plant-Specific 3.8 / 3.9

References
34AB-N61-002-1, Main Condenser Vacuum Low
34AR-650-148-1, Turbine Vacuum Low-Low annunciator procedure
34GO-OPS-005-1, Power Changes
34GO-OPS-013-1, Normal Plant Shutdown
B21-SLLS-LP-01401, Main Steam & Low Low Set lesson plan

1- Bullet conditions, Bold Unit 1

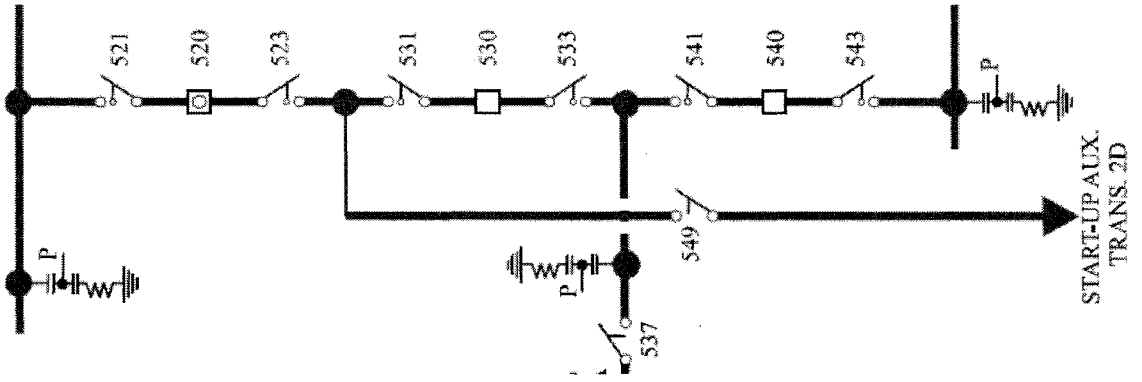
RFA approved 10/24/2007

Tier:	2	Group:	2
Keyword:	EHC	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

82. 262001A2.08 003/2/1/4160VAC/NEW/HIGHER/HT2007-301/SRO/BLC/RFA

Unit 2 is operating at 100% power. PCB 179530 has been tagged open for Switchyard Maintenance to perform preventative maintenance. A Switching order to open disconnect 179531 and 179533 has been issued by the Transmission Control center.

Which ONE of the following correctly completes the statement that predicts the impact to plant operations and one of the procedures required to mitigate the consequences of inadvertently opening Disconnect 179523 instead of 179533.



Unit 2 will _____.

Procedure _____ should be entered to energize LPCI MCC, R24-S018A/B.

(All plant equipment is operable with a normal alignment, and responds as designed.)

A. NOT scram /
34SO-R24-003-2, 2R24-S018A/B 600 VOLT MCC OPERATION

B. NOT scram /
34SO-R24-003-1, 1R24-S018A/B 600 VOLT MCC OPERATION

C. scram /
34SO-R24-003-2, 2R24-S018A/B 600 VOLT MCC OPERATION

D. scram /
34SO-R24-003-1, 1R24-S018A/B 600 VOLT MCC OPERATION

Updated 119/07 for replacement question RSG

A. Incorrect because opening disconnect 179523 deenergizes SAT 2D, which causes a power loss to RPS and a scram, but plausible if applicant does not recognize that SAT 2D is deenergized from both power sources. Unit 2 procedures are incorrect because R24-S018A/B are powered from the opposite unit's essential 600 VAC busses, but plausible because if applicant does not recall that these busses are fed from the opposite unit and assumes that they are powered from the same unit's SAT2D.

B. First part is incorrect but plausible for same reason as A. Procedures listed are correct.

C. First part is correct since SAT 2D is deenergized, which deenergizes RPS and causes a scram. Second part if incorrect but plausible for same reason as listed in A.

D. Correct.

SRO only because linked to 10CFR55.43(5): Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

A2. Ability to (a) predict the impacts of the following on the A.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) A2.08 Opening a disconnect under load .. . . . 3.3 / 3.6

References
34SO-R22-001-1, 4160VAC System
R22-4160VAC-LP-02702, 4160 VAC lesson plan
34AB-R22-001-1, Loss of DC Buses AOP

Replace question. Does not match KA.

Question tests knowledge of trip features of a breaker with loss of control power, not the KA of predicting the impact of opening a disconnect under load and using procedures based on those predictions.Opening a breaker to control power is not the same as opening a disconnect under load. Question has been replaced.

RFA 10/24/2007

Tier:	2	Group:	1
Keyword:	4160VAC	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

83. 295003AA2.04 001/1/1/TRANSFORMER/NEW/HIGHER/HT2007-301/SRO/BLC/RFA

Unit 1 and 2 are operating at 100% power with all 4KV busses normally aligned.

A transformer fire and fault occurs on Startup transformer 2C and all automatic actions associated with the transformer fault occur as expected.

Which ONE of the following identifies how the availability of the transformer affects the AC system lineup and describes the minimum required completion time for 34SV-SUV-013-0, Weekly Breaker Alignment surveillance?

A. BOTH units are in a RAS for 3.8.1, AC Sources - Operating

The surveillance is required to be performed WITHIN 1 HOUR

B. BOTH units are in a RAS for 3.8.1, AC Sources - Operating

The surveillance is required to be performed WITHIN 8 HOURS

C. ONLY Unit 2 is in a RAS for 3.8.1, AC Sources - Operating

The surveillance is required to be performed WITHIN 8 HOURS

D. ONLY Unit 2 is in a RAS for 3.8.1, AC Sources - Operating

The surveillance is required to be performed WITHIN 1 HOUR

Note: Both SATs 1C and 2C are fed from the same point on the 230 kV grid. A SAT 2C fault results in PCB s 179470, 179480 tripping open, which affects SAT 1C availability.

A. Correct

B. Incorrect because TS 3.8.1.A.1 requires surveillance within one hour. Plausible because action statement is similar time frame.

C. Incorrect because both units will be in an active LCO. Also incorrect because TS 3.8.1.A.1 requires surveillance within one hour. Plausible because transformer is on Unit 2.

D. Incorrect because both units will be in an active LCO. Also incorrect because the acceptance criteria will not be met. Plausible because transformer is on Unit 2.

SRO only because of tie to 10CFR55.43(2): Tech specs

AA2. Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : (CFR: 41.10 / 43.5 / 45.13) AA2.04 System lineups..... 3.5/ 3.7

References
34SV-SUV-013-0, Weekly Breaker Alignment Checks
S22-ELECT-LP-02701, Electrical Distribution System lesson plan
Tech Spec 3.8.1, AC Sources - Operating

Bold Unit 1 and 2
Edit to replace "an active LCO" with "a RAS"
Delete from each choice whether the acceptance criteria is met. Reason is that if acceptance criteria is met, then RAS is not active
Provide drawing of the 230KV Switchyard.

RFA approved 10/24/2007

Tier:	1	Group:	1
Keyword:	TRANSFORMER	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

84. 295004AA2.02 001/1/1/DC POWER/NEW/FUND/HT2007-301/SRO/BLC/RFA

Unit 2 was operating at 50% power when the 125VDC Distribution Cabinet 2D, 2R25-S129 was lost and the following annunciator was received:

ECCS/RPS DIVISION 1 TROUBLE (602-110)

The SRO is in the process of identifying which analog transmitter trip system (ATTS) units were affected and is performing a loss of safety function determination in accordance with the Technical Requirements Manual (TRM).

Which ONE of the following identifies the affected analog transmitter trip units and describes the TRM Loss of Function Diagrams (LFD)?

A. Two RPS ATTS cabinets will be de-energized.

   The loss of function statement found at the bottom of the LFD identifies the channel combinations which are no longer available for the safety function.

B. Two RPS ATTS cabinets will be de-energized.

   The loss of function statement found at the bottom of the LFD identifies the channel combinations required to be operable in order to maintain the safety function.

C. Two ECCS ATTS cabinets will be de-energized.

   The loss of function statement found at the bottom of the LFD identifies the channel combinations required to be operable in order to maintain the safety function.

D. Two ECCS ATTS cabinets will be de-energized.

   The loss of function statement found at the bottom of the LFD identifies the channel combinations which are no longer available for the safety function.

Note: Each ATTS panel has two internal power supplies. Only one power supply needs to be available to supply the entire ATTS panel. The ECCS division consists of panels H11-P925, P926, P927 and P928.

Note: 125VDC Dist Cab 2D Breakers 1& 2 power up both of the power supplies for panel 2H11-P925. Breakers 5 & 7 power up both of the power supplies for panel 2H11-P927.

Note: The loss of function statement typically found at the bottom of the LFD identifies the channel combinations required to be operable in order for instrument function capability as defined in the instrumentation specification to be maintained.

A. Incorrect because the DC cabinet which was lost does not provide power to the RPS ATTS cabinets. Also incorrect because the LFD identifies the channels required for the safety function. Plausible since RPS ATTS cabinets are similar to the ECCS cabinets.

B. Incorrect because the DC cabinet which was lost does not provide power to the RPS ATTS cabinets. Plausible since RPS ATTS cabinets are similar to the ECCS cabinets.

C. Correct.

D. Incorrect because the LFD identifies the channels required for the safety function. Plausible if applicant does not understand the content provided in LFDs.

SRO only because linked to 10CFR55.43 (2): Tech specs

AA2. Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER: (CFR: 41.10 / 43.5 / 45.13) AA2.02 Extent of partial or complete loss of D.C. power.... 3.5/ 3.9

References
TRM Section 11.0, Loss of Function Diagrams
34AB-R22-001-2, Loss of DC Buses AOP
34AR-602-110-2, ECCS/RPS Division 1 Trouble annunciator procedure

Bold Unit 2

Tier:	1	Group:	1
Keyword:	DC POWER	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

85. 295014G2.4.31 001/1/2/RODS/NEW/HIGHER/HT2007-301/SRO/BLC/RFA

Unit 2 is starting up and reactor power is 14% power. The operator is pulling rods to achieve 2 bypass valves to roll the turbine.

Due to a previous rod being difficult to move, the CRD drive water pressure had been temporarily raised to 300 psid and not re-adjusted back down to a normal pressure. When the operator placed the rod movement control switch to the single notch out position for the next control rod, the rod quickly moved from position 16 to 22 (intended position and withdraw limit is 18). The following alarm was received:

RMCS/RWM ROD BLOCK OR SYSTEM TROUBLE (603-239)

Which ONE of the following describes the impact of this alarm condition in accordance with 34GO-OPS-065-0, Control Rod Movement, and Tech Specs?

This _____ a "mispositioned" control rod. Tech Spec 3.1.6 Rod Pattern Control _____ a Required Action Statement applicable to these plant conditions.

A. IS NOT / contains

B. IS NOT / does NOT contain

C. IS / contains

D. IS / does NOT contain

Updated 11/19/07 RSG
Note: This condition will cause both annunciators 603-238 & 603-239 to alarm.

A. Incorrect because the rod is consdered mispositioned IAW 34GO-OPS-065-0 section 7.5.1, but plausible because a rod can be one notch from intended position without meeting criteria for mispositioned rod. Also incorrect because BPWS Tech Spec is only applicable in Modes 1 & 2 when thermal power is < 10%. Plausible because RWM should be enforcing up to the plant set point of 21% power or if applicant does not recall TS LCO applicability power limit.

B. First part is incorrect but plausible for same reason as A. Second part is correct.

C. Incorrect because BPWS Tech Spec is only applicable in Modes 1 & 2 when thermal power is < 10%. Plausible because RWM should be enforcing up to the plant set point of 21% power. First part is correct.

D. Correct.

SRO only because this question is tied to tech spec 10CFR55.43 (2)

APE: 295014 Inadvertent Reactivity Addition
2.4.31 Knowledge of annunciators alarms and indications / and use of the response instructions. (CFR: 41.10 / 45.3)
IMPORTANCE 3.3 / 3.4

References
34GO-OPS-065-0, Control Rod Movement
34AR-603-248-1, Rod Overtravel annunciator procedure
34AR-603-247-1, Rod Drift annunciator procedure
34AR-603-238-1, Rod Out Block annunciator procedure
34AR-603-239-1, RMCS/RWM Rod Block or System Trouble annunciator procedure
34AB-C11-004-1, Mispositioned Control Rods
Tech Spec 3.1.6, Rod Pattern Control
Tech Spec 3.1.3, Control Rod Operability

Bold Unit #
Added "...and withdrawn limit is 18)
Need withdraw limits. If limit is 48, rod would not be mispositioned

RFA approved 10/24/2007

Tier:	1	Group:	2
Keyword:	RODS	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

86. 295020AA2.04 001/1/2/HPCI/RCIC/NEW/HIGHER/HT2007-301/SRO/

A heatup and pressurization on **Unit 2** was in progress with the following initial conditions:

- Reactor pressure: 170 psig
- HPCI / RCIC: Operable in standby lineup
- MSIVs: Closed

While pressure was being equalized across the MSIVs, reactor pressure lowered from 170 to 125 psig.

Given the current status, which ONE of the following describes the actions which are allowed by tech specs?

A. The mode switch may be taken from startup to run.
Restore HPCI to operable within 14 days.

B. The mode switch may NOT be taken to run.
Restore HPCI to operable within 14 days.

C. The mode switch may NOT be taken to run.
Reduce steam pressure to less than or equal to 150 psig within 36 hours.

D. Place the mode switch to the shutdown position in 12 hours
Reduce steam pressure to less than or equal to 150 psig within 36 hours.

Updated 11/19/07 RSG

HPCI isolated at 128 psig. The crew should recognize that reactor pressure (125 psig) lowered below the HPCI isolation setpoint while they were equalizing across the MSIVs. Thus, an inadvertent containment isolation (Group 3) has occurred.

A. Incorrect because LCO 3.0.4 condition a or c cannot be met. Plausible if applicant thinks that LCO 3.0.4 condition b applies. Second sentence is correct.

B. Correct.

C. Incorrect but plausible for same reason as A. Second sentence is incorrect because RCIC is still operable, but plausible if applicant diagnoses RCIC and HPCI inop and enters action 3.5.1 Condition E.

D. Incorrect because the heatup and pressurization in Mode 2 can continue with RCIC operable. Plausible if the applicant thinks that both HPCI and RCIC have isolated and that Condition E is applicable.

SRO only because this question is tied to 10CFR55.43(2): Facility operating limitations in the technical specifications and their bases.

AA2. Ability to determine and/or interpret the following as they apply to INADVERTENT CONTAINMENT ISOLATION : (CFR: 41.10 / 43.5 / 45.13) AA2.04 Reactor pressure..... 3.9 / 3.9

References
34GO-OPS-001-2, Plant Startup procedure
Tech Spec 3.5.1, ECCS-Operating
34SO-E41-001-2, HPCI procedure
E51-RCIC-LP-03901, RCIC lesson plan

Editorial Change initial pressure to 140 psig to be more realistic, since it is unlikely that HPCI would be placed in service with only a 2 psig margin to the isolation signal (within reset band of instrument).
Also reformat to break up long paragraph into 3 separate lines for readability.

RFA approved 10/24/2007

Tier:	1	Group:	2
Keyword:	HPCI/RCIC	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	

87. 295025EA2.06 001/1/1/STEAM COOLING/MODIFIED BANK/HIGHER/HT2007-301/SRO/BLC/RFA

A loss of all high and low pressure injection has occurred on **Unit 2** with the following conditions:

All rods inserted
Reactor Water Level.....-190 inches and decreasing 2"/min
Reactor Pressure..... 858 psig being controlled by LLS logic
Steam Cooling is in progress

Because of successful maintenance efforts, HPCI has become available and the crew has just started injecting to the vessel. The current reactor water level is -189 inches and rising.

Given these conditions, which ONE of the following procedures is required to be implemented?

A. CP-2, RPV Flooding

B. CP-1, Steam Cooling

C. CP-1, Emergency Depressurization

D. RC RPV Control (Non-ATWS)

EOPs require remaining pressurized following a loss of all high and low pressure injection systems and beginning steam cooling (@ -185") UNTIL an injection system is regained; then ED. In this case ED'g will eliminate the injection system (HPCI); and EOPs specifically exempt ED in this situation. The question satisfies KA because requires interpretation of RPV water level as it pertains to high reactor pressure, i.e. being in steam cooling.

A. Incorrect because level instrumentation is available. Plausible because this is an override step in the steam cooling procedure.

B. Incorrect because an override step in the steam cooling procedure states that if reactor water level is increasing, then perform RC/P (non atws). Plausible if the applicant realizes that level is still less than -185" (entry condition for steam cooling).

C. Incorrect because an override step in the steam cooling procedure states that if any system is regained then emergency depressurization is required IF level cannot be restored. Since level is being restored, then emergency depress is not required. Plausible if the applicant fails to assess that level is being raised and strictly adheres to the override step.

D. Correct.

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedure.

EA2. Ability to determine and/or interpret the following as they apply to HIGH **REACTOR PRESSURE:**
(CFR: 41.10 / 43.5 / 45.13) EA2.06 Reactor water level..... 3.7/ 3.8

[No reference provided to applicant]

References
Licensee's LOR Exam Bank (modified)
Media Number: LR-LP-20309
Objective Number: 201.083.A.04
LR-LP-201083
SRO NRC CAT - B, RO NRC CAT - B, Active - -1, References - 31EO-EOP-015-2S, rls, KeyWords - PUBLISH, PROCEDURE,BIENNIAL(B)

EOP-CP1-LP-20309, Contingency Procedures (CP-1) lesson plan

Tier:	1	Group:	1
Keyword:	STEAM COOLING	Source:	MODIFIED BANK
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

88. 295026G2.1.28 001/1/1/TORUS TEMP/NEW/FUND/HT2007-301/SRO/BLC/RFA

Which ONE of the following describes the Torus Average Bulk Temperature Recorder, 1T48-R647, and also identifies Tech Spec 3.3.3.1, Post Accident Monitoring (PAM) instrumentation channel requirements for each suppression pool quadrant on **Unit 1**?

[Reference provided]

A. The T48-R647 recorder receives input from only the upper temperature elements.
The 2 torus temperature channels required by TS 3.3.3.1 can ONLY be satisfied with two lower elements, i.e., N009A-D.

B. The T48-R647 recorder receives input from both upper and lower temperature elements.
The 2 torus temperature channels required by TS 3.3.3.1 can ONLY be satisfied with two lower elements, i.e., N009A-D.

C✓ The T48-R647 recorder receives input from only the upper temperature elements.
The 2 torus temperature channels required by TS 3.3.3.1 can be satisfied with one lower element (N009A-D) AND one upper element. (N301-N311)

D. The T48-R647 recorder receives input from both upper and lower temperature elements.
The 2 torus temperature channels required by TS 3.3.3.1 can be satisfied with one lower element (N009A-D) AND one upper element. (N301-N311)

Applicant Reference: Provide the Unit 1 Tech Spec 3.3.3.1 and TRM Table T10.3.1.sheet 5 and 6. Do NOT provide tech spec bases.

Note: The average torus bulk water temperature is calculated using airspace and waterspace temperature elements.

A. Incorrect because TRM Table 10.3-1 requires one N009 and one N300 temperature element. Plausible since the TS function is for pool water temperature.

B. Incorrect because T48-R647 only receives input from the N300 elements. Also incorrect because TRM Table 10.3-1 requires one N009 and one N300 temperature element. Plausible since the TS function is for pool water temperature.

C. Correct

D. Incorrect because recorder T48-R647 only receives input from N300 elements. Plausible since this recorder is for torus temperature indication.

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for SRO Final Version 11.26.2007

SRO only because of tie to 10CFR55.43 (2): Tech specs

295026 Suppression Pool High Water Temperature
2.1.28 Knowledge of the purpose and function of major system components and controls.
(CFR: 41.7) IMPORTANCE 3.2 /3.3

34SV-SUV-019-1/2, Attachment 2, Torus Temperature Monitoring
TS 3.3.3.1, PAM Instrumentation
TRM Table T10.3-1, Sheet 5 of 7, Qualified Post Accident Monitoring Instrumentation
34AR-657-072-1, Multipoint Rcdr 1T47-R611 Temp High annunciator procedure
34AR-654-009-1, Multipoint Rcdr 1T47-R612 Temp High annunciator procedure

Replacement recommended.
Questionable KA match: Test knowledge of inputs to a recorder and TS requirements for the instrument function rather than the KA knowledge of purpose/function of major system components and controls.

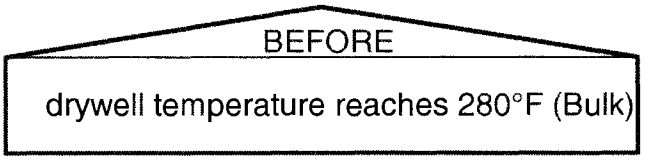
Recall required is too specific for closed reference. Requires detailed memory of sheet 5 of a 7 page Table in TRM, and detailed memory of which sensors input into a specific recorder, neither of which are reasonable for closed reference.
Because of level of memory required, the LOD is a 5, does not discriminate.
As constructed, the question has weak stem focus and is a collection of T/F statements

Left original question, added reference
RFA approved 10/24/2007

Tier:	1	Group:	1
Keyword:	TORUS TEMP	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

89. 295028EA2.06 001/1/1/DW TEMP/NEW/FUND/HT2007-301/SRO/BLC/RFA

A loss of drywell cooling has occurred. The SRO reaches the following step in the primary containment control flowchart drywell temperature leg:



Which ONE of the following will correctly complete the following statements?

The word "Bulk" means a weighted average of the _____ air space.

The Tech Spec bases for the drywell temperature LCO is to ensure that during a Design Basis Accident, the resultant peak LOCA drywell temperature is maintained below _____.

A. Drywell and Torus / 250°F

B. Drywell and Torus / 281°F

C. Drywell / 250°F

D. Drywell / 281°F

Updated 11/19/07 RSG

A. Incorrect because bulk drywell temperature does not include torus air temperature, but plausible if applicant believes step is referring to containment temperature. Temperature is incorrect because the TS basis is 281 degrees, but is plausible because 250 degrees is a U2 limit for overriding DW coolers during a LOCA.

B. DW and torus is incorrect but plausible as described for A. 281 degrees is correct.

C. 250 degrees is incorrect but plausible for same reason as stated in A. Drywell is correct.

D. Correct

SRO only because of link to 10CFR55.43 (5): Tech Spec 3.6.1.5 bases for 150 deg LCO limit. Per discussion w/ RFA on 9/25/07: Ability to differentiate between torus air space and drywell air space is implied.

EA2. Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE : (CFR: 41.10 / 43.5 / 45.13) EA2.06 Torus/suppression chamber air space temperature: Plant-Specific..... 3.4 / 3.7

References
EOP-TERMS-LP-20304, EOP Terminology & Definitions
TS 3.6.1.5, Drywell Air Temperature (including bases)
TRM Table T10.3-1, Qualified Post Accident Monitoring Instrumentation
34SV-SUV-019-1, Surveillance Checks

Correct spelling of initial
Since the question starts with an EOP step, the candidate may assume the second part of the question is asking for the reason for the 340F limit. Recommend separation of two questions with 1) and 2) and adding LCO to improve stem focus on what question is asking.

RFA Approved 10/24/2007

Tier:	1	Group:	1
Keyword:	DW TEMP	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

90. 295033G2.4.50 001/1/2/REFUEL/NEW/HIGHER/HT2007-301/SRO/BLC/RFA

A refueling accident occurred in the **Unit 1** fuel pool and the following alarms were received in the **Unit 1** control room:

- **REFUELING FLOOR VENT EXHAUST RADIATION HIGH** (601-409)
- **REFUELING FLOOR AREA RADIATION HIGH** (601-110)
- **1D11-K611A-D** are reading 12 mR/hr
- **1D21-K601D** is reading 32 mR/hr

Which ONE of the following is correct for secondary containment control entry conditions and identifies the correct emergency classification?

[Reference provided]

A. The annunciator setpoint for the EXHAUST rad monitor satisfies the entry condition value listed in the secondary containment control table 6.

   Unusual Event

B. ✓ The annunciator setpoint for the EXHAUST rad monitor DOES NOT satisfy the entry condition value listed in the secondary containment control table 6.

   Alert

C. The annunciator setpoint for the AREA rad monitor satisfies the entry condition value listed in the secondary containment control table 6.

   Alert

D. The annunciator setpoint for the AREA rad monitor DOES NOT meet the entry condition value listed in the secondary containment control table 6.

   Unusual Event

Applicant Reference: Provide New EAL Draft 73EP-EIP-001-0 Radiological Part (Left 2 Columns) of EAL Chart and provide Unit 1, Table 6 of Secondary Containment Control (Do NOT provide flowchart)

Updated 11/19/07 RSG

A. Incorrect because the exhaust alarm is only HIGH (versus HIGH HIGH). Plausible if applicant does not know there is a HIGH HIGH alarm available. EAL is incorrect because condtions are met for ALERT, but plausible because there are numerous K601 and K611 alarms on the RF floor which are criteria for an unusual event.

B. Correct

C. Entry condition is incorrect but plausible for same reason as A. EAL is correct.

D. EAL is incorrect but plausible for same reason as A. Entry condition not being met is correct.

SRO-only because linked to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriaate procedures during normal, abnormal, and emergency situations. Also linked to 10CFR55.43 (7): Fuel handling facilities and procedures.

EPE: 295033 High Secondary Containment Area Radiation Levels
2.4.50 Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.
(CFR: 45.3) IMPORTANCE 3.3 / 3.3

References
31EO-EOP-014-1, Unit 1 Secondary Containment Control flowchart
73EP-EIP-001-0, Section 18, Fuel Damage By Fuel Handling Accident
34AR-601-409-1, Refueling Floor Vent Exhaust Radiation High annunciator procedure
34AR-601-110-1, Refueling Floor Area Radiation High annunciator procedure

Answer incorrect because based on old EAL's. Edited to correct.
Distracters B and C are the same. Edited as described below to correct.
Provide correct "Unit 1" SCC Table 6 reference and correct EAL reference (Cold Chart, final draft 73EP-EIP-001 revision for new EAL)

1-Bold Unit 1 and Rad monitor numbers, bullet conditions
2- Edit question to provide readings below the SCC entry condition (consistent with information provided in original question)
3- Delete alarm "setpoint"s. The significance is with the alarm not the setpoint, even though the instrument is at the setpoint.

RFA Approved 10/24/2007

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Tier:	1	Group:	2
Keyword:	REFUEL	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

91. 295038G2.2.22 001/1/1/RELEASE/NEW/FUND/HT2007-301/SRO/BLC/RFA

While operating at 100% power, the following alarm is received:

O/G AVG ANNUAL REL LIMIT WILL BE EXCEEDED (601-406-2)

Which ONE of the following radiation monitors triggered this alarm and which reference identifies when this instrument is required to be operable?

A. Offgas pretreatment rad monitors (D11-K601 and K602)

Tech Specs 3.7.6, Main Condenser Offgas

B. ✓ Offgas pretreatment rad monitors (D11-K601 or K602)

Offsite Dose Calculation Manual (ODCM) 3.1.1, Gaseous Effluent Monitoring Instrumentation

C. Stack offgas rad monitor (Normal range D11-K600A or B)

Tech Specs 3.7.6, Main Condenser Offgas

D. Stack offgas rad monitor (Normal range D11-K600A or B)

Offsite Dose Calculation Manual (ODCM) 3.1.1, Gaseous Effluent Monitoring Instrumentation

A. Incorrect because LCO 3.7.6 does not include action statements when this rad monitor becomes inoperable. Plausible because the rad monitor alarm setpoint is based on the 240 micoCurie limiting condition of operation in LCO 3.7.6.

B. Correct.

C. Incorrect because the alarm is not triggered by the stack rad monitor. Also incorrect because LCO 3.7.6 does not include action statements when this rad monitor becomes inoperable. Plausible because the rad monitor alarm setpoint is based on the 240 micoCurie limiting condition of operation in LCO 3.7.6. Also plausible if applicant does not know what causes alarm and simply relies on annunciator wording.

D. Incorrect because the alarm is not triggered by the stack rad monitor. Plausible if applicant simply relies on the annunciator label or does not know the basis for gaseous instrumentation setpoints in ODCM.

SRO only because tied to 10CFR55.43 (2): Licensing basis ODCM

EPE: 295038 High Off-Site Release Rate
2.2.22 **Knowledge of limiting conditions for operations and safety limits.** (CFR: 43.2 / 45.2)
IMPORTANCE 3.4 / 4.1

References
LCO 3.7.6, Main Condenser Offgas
HNP ODCM, Chapter 3, Gaseous Effluents
34AR-601-406-2, O/G Avg Annual Rel Limit Will Be Exceeded annunciator procedure
D11-PRM-LP-10007, Process Rad Monitors

Change A to Offgas posttreatment rad monitors (D11-K615 A and B) and Off-Gas Post-Treatment Instrumentation TLCO 3.3.8

Add to ref: D11-PRM-LP-10007, Process Rad Monitors

A. is also true
ODCM 3.1.1 actions for inoperable monitor include performance of SR 3.7.6.which is contained in LCO 3.7.6. ODCM 3.1.1 also specifies that LCO 3.7.6 is to be entered if the 3 actions stated in ODCM 3.1.1 are not done.
Change "and" to "or" between instrument MPL #s. It only takes one of the instruments, not both.

RFA Approved 10/24/2007

Tier:	1	Group:	1
Keyword:	RELEASE	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

92. 400000A2.03 001/2/1/CCW/NEW/HIGHER/HT2007-301/SRO/BLC/RFA

Unit 2 is at 30% power during a startup after an extended outage when the following alarm is received:

RBCCW HX OUTLET TEMP HIGH (650-249)

The control room operator observes the RBCCW pump suction temperature is 101 °F and dispatches the system operator to increase service water flow through the heat exchanger.

The result of the operator locally throttling open the service water valve would be _____. The PSW Effluent Monitor must be operable _____.

A. reduced PSW to RBCCW differential pressure

ONLY in Modes 1 and 2

B. reduced PSW to RBCCW differential pressure

ONLY if ODCM differential pressure requirements are not met

C. increased PSW to RBCCW differential pressure

ONLY in Modes 1 and 2

D. increased PSW to RBCCW differential pressure

ONLY if ODCM differential pressure requirements are not met

Confirmed 11/19/07 RSG

A. First part is true. Second part is incorrect but plausible because modes 1 and 2 are typical modes for many LCO applicabilities.

B. Correct

C. First part is incorrect but plausible if candidate does not recall which pressure is maintained higher and why. Second part same analysis as A.

D. FIrst part same analysis as C. Second part is true.

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SRO only because this question is tied to 10CFR55.43 (2): Facility operating limitations in the technical specifications and their bases. Also tied to 10CFR55.43 (5): Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.

A2. Ability to (a) predict the impacts of the following on the CCWS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: (CFR: 41.5 / 45.6)
A2.03 High/low CCW temperature . . 2.9 / 3.0

References
34AR-650-238-2, Hx PSW/RBCCW Diff Press Low annunciator procedure
34AR-650-249-2, RBCCW Hx Outlet Temp High annunicator procedure
34SO-P42-001-1, Section 7.3.8, Adjusting RBCCW/PSW Differential pressure
HNP ODCM, Section 2.1.1, Liquid Effluent Monitoring Instrumentation Control
P42-RBCCW-LP-00901, RBCCW lesson plan

Edit to address recall too specific
Recall required is too specific for closed reference for two reasons:
1) both the valves listed in correct answer and distracters would lower RBCCW temp HX outlet temp. Noun names are descriptive of both valves. (service water discharge vs PSW discharge).
2) ODCM table is too detailed to expect recall in closed reference (8 instruments with 4 applicability footnotes and five action statements).

RFA approved 10/24/2007

Tier:	2	Group:	1
Keyword:	CCW	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

93. 600000G2.4.29 001/1/1/E-PLAN/MODIFIED BANK/HIGHER/HT2007-301/SRO/BLC/RFA

Following a scram on **Unit 2,** caused by a Group 1 isolation signal, the following conditions are noted:

- All MSIV switches have been taken to closed position
- Both MSIV's in the "C" MSL are still open
- Reports of a steam leak in the Reactor Building have been received
- Main Steam Line Tunnel Ambient and Differential Temperature Alarms are lit
- RPV water level is 0" and controlled w/ HPCI and RCIC

Given these current conditions, which ONE of the following is the correct Emergency Action Level?

[Reference provided]

A. General Emergency

B. Site Area Emergency

C. Alert

D. Notification of an Unusual Event

Applicant Reference: Provide applicant the Fission Product Barrier Chart

Confirmed updated 11/20/07 RSG

Note: Two actuals are met and a potential is met, but potential is not on a third barrier.

A. Incorrect because the fuel clad barrier is intact. Plausible because General Emergency requires loss of two actuals (met) and a actual of potential loss of third barrier.

B. Correct

C. Incorrect but plausible if candidates only identified loss of RCS barrier which is an Alert.

D. Incorrect but plausible if candidate only identifies loss of containment which is an NUE.

QUESTIONS REPORT
for SRO Final Version 11.26.2007

This K/A was changed from 6000000 G2.4.49 [Ability to perform w/o reference to procedures those actions that require immediate operation of system components and controls]

TO

6000000 G2.4.29 [Knowledge of the emergency plan] BECAUSE the Hatch Fire AOP does not include any immediate actions.

SRO only because of link to 10CFR55.43 (5): Assessment of facility conditions and E-plan classification. APE: 600000 Plant Fire On Site

2.4.29 Knowledge of the emergency plan. (CFR: 43.5 / 45.11) IMPORTANCE RO 2.6 / SRO 4.0

References
Draft 73EP-EIP-001-0, EMERGENCY CLASSIFICATION AND INITIAL ACTIONS
EP-LP-20101-03, Initial/Terminating Activities

Provide reference
Replace question due to same classification for a JPM
Provided distracter and plausibility analysis.

RFA Approved 10/24/2007

Tier:	1	Group:	1
Keyword:	E-PLAN	Source:	MODIFIED BANK
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

94. G2.1.14 001/3/1/NOTIFICATIONS/NEW/FUND/HT2007-301/SRO/BLC/RFA

Which ONE of the following identifies a plant personnel notification (including the specific procedure) that is first required when the reactor is made critical and is AGAIN required when the mode switch is transferred to RUN?

A. On-shift Lab foreman
In accordance with 34GO-OPS-001-2, Plant Startup

B. Northern/Southen Control Center
In accordance with 34GO-OPS-001-2, Plant Startup

C. Plant Manager
IAW Reactivity Management Program, 40AC-ENG-016-0

D. Reactor Engineer
IAW Reactivity Management Program, 40AC-ENG-016-0

A. Correct.

B. Incorrect because the procedure does not state this because at these points, the dispatcher is not affected. Plausible if applicant perceives that impending tie-to-the-grid activities are being approached.

C. Incorrect because the procedure does not state this. Plausible if applicant reasons that these plateaus are important for the plant manager to be aware of.

D. Incorrect because the procedure does not state this. Plausible if applicant reasons that these plateaus are important for the reactor engineer to be aware of and because procedure specifies times for RE to be notified..

SRO only because of link to 10CFR55.43 (5): procedures

2.1.14 Knowledge of system status criteria which require the notification of plant personnel. (CFR: 43.5 / 45.12)
IMPORTANCE 2.5 / 3.3

References
34GO-OPS-001-2, Plant Startup

Added to plausibility description for D.

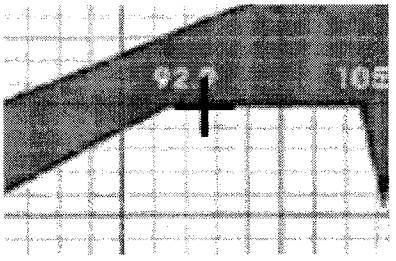
RFA approved 10/24/2007

Tier:	3	Group:	1
Keyword:	NOTIFICATIONS	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

95. G2.1.7 001/3/1/OPRM/NEW/HIGHER/HT2007-301/SRO/BLC/RFA

The following conditions exist on **Unit 1:**

- 100% Reactor Power
- 95% Core Flow



The following occurs:

- 5th stage "A" Feedwater heater extraction isolation valves close due to high heater levels
- Final feedwater temperature stabilizes at 52°F below the pre-event temperature
- The APLHGR thermal limit is exceeded

The operator uses recirc ONLY to reduce power no further than directed by 34AB-N21-001-1, Loss of Feedwater Heating.

Which ONE of the following will correctly complete the statement below concerning the core behavior and Tech Spec required actions?

Entry into the immediate exit region of the power-to-flow map _____ occur.
The minimum Tech Specs completion time for restoring APLHGR to within limits is _____ hours.

A. will / two

B. will / four

C. will NOT / two

D. will NOT / four

Updated 11/20/2007 RSG
A. Correct

B. Incorrect because minimum completion time is 2 hours, but plausible because 4 hours is the completion time if Condtion A is not met.

C. Incorrect because the IE region will be entered, but plausible if candidate believes that slope of load line is parallel to boundary of IE region or does not recognize significance of high power, low flow starting point in relation to slope of load line. Two hours is correct.

D. Same analysis as "C" for "will NOT." Same analysis as "B" for 4 hours.

SRO only because of link to 10CFR55.43 (2): Tech Specs bases

2.1.7 Ability to evaluate plant performance and make operational judgments based onoperating characteristics / reactor behavior / and instrument interpretation. (CFR: 43.5 / 45.12 / 45.13) IMPORTANCE 3.7 / 4.4

References
34GO-OPS-005-2, Power Changes, Attachment 1, Power-to-flow map
Tech Spec 3.3.1.1., RPS Instrumentation (including bases)

Tier:	3	Group:	1
Keyword:	OPRM	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

96. G2.2.19 001/3/2/WORK/NEW/FUND/HT2007-301/SRO/BLC/RFA

In accordance with 50AC-MNT-001-0, Maintenance Program, an MWO _____ required for emergency maintenance prior to performing work and normally can ONLY be authorized by the _____ or higher.

A. is / Emergency Director

B. is / Shift Supervisor

C. is NOT / Emergency Director

D. is NOT / Shift Supervisor

Updated CME 11/20/2007

A. Plausible but incorrect because MWO is normally required prior to work and is required after the emergency maintenance. If candidate does not know whose authorization is required, ED is plausible since it is considered an emergency.

B. Same analysis for first statement. Second statement is correct.

C. First statement is correct. Second statement has same analysis as A.

D. Correct.

SRO-only because of job/task requirements for Work Control Center.

2.2.19 Knowledge of maintenance work order requirements. (CFR: 43.5 / 45.13) IMPORTANCE 2.1 / 3.1

References
50AC-MNT-001-0, Maintenance Program (Section 8.1.6.2)
NMP-GM-006, Work Management (Section 4.10)

Replace question due to job-link.

Job-link weak. SRO has minimal involvement in documenting and classifying minor work. SRO not involved in tool pouch work documentation.
Recall required is too specific for closed reference, esp. for an aspect with little SS involvement. As such, does not discriminate. Question has been replaced.

RFA Approved 10/24/2007

Tier:	3	Group:	2
Keyword:	WORK	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

97. G2.2.34 002/3/2/CRDM/NEW/HIGHER/HT2007-301/SRO/BLC/RFA

Unit 2 was operating at 100% power with the following conditions:

The following 10 rods have been declared "Slow": (see attached map)
22-31, 26-15, 26-39, 26-47, 30-15, 30-23, 34-39, 38-15, 38-23, 38-31

HCU 26-27 develops a leak resulting in accumulator pressure of 920 psig.

Which ONE of the following identifies the minimum Tech Spec required actions if HCU accumulator 26-27 develops a leak which cannot be repaired?

[Reference provided]

A. Be in Mode 3 within 12 hours. No further RAS actions are required.

B. Declare rod 26-27 "slow" within 8 hours. No further RAS actions are required.

C. Declare rod 26-27 inoperable within 8 hours. Insert the rod within the following 3 hours and disarm the rod within 4 hours.

D. Initiate action within 1 hour to be in Mode 2 within 7 hours, Mode 3 within 13 hours, and Mode 4 within 37 hours.

Applicant Reference: Provide control rod exercise signoff sheet (34SV-C11-003-2, Attachment 3) with the ten rods identified with an "X." Also provide T.S. 3.1.3, 3.1.4, 3.1.5. Do NOT provide tech spec bases.

Updated 11/21/07 RSG/CME
Updated 11/27/07 BLC/RSG

A. Incorrect because the rod does not have to be declared inoperable or slow for 8 hours. Plausible because with 11 rods slow after 8 hours, the actions would be correct.

B. Incorrect because further actions are required after 8 hours. Plausible because the rod can be declared slow or inoperable after 8 hours, with an inoperable accumulator. Also, plausible if the applicant does not recognize that declaring the rod slow or inoperable reuires actions to be taken in Tech Spec 3.1.3 or 3.1.4

C. Correct

D. Incorrect because there is an applicable action statement for this situation, i.e., TS 3.1.3.C1 & 2. Plausible if the applicant cannot identify an applicable action statement and chooses TS 3.0.3. which is correct if there are no applicable action statements.

Direct tie to 55.43 (6). TS tie not required
2.2.34 Knowledge of the process for determining the internal and external effects on core reactivity. (CFR: 43.6)
IMPORTANCE 2.8 / 3.2*
KA modified and moved to 2.1.43
Ability to use procedures to determine the effects on reactivity of plant changes, such as reactor coolant system temperature, secondary plant, fuel depletion, etc. (CFR: 41.10/ 43.6/ 45.6) 4.1/4.3

References
34GO-OPS-001-1/2
34GO-OPS-065

Questionable KA match. Substitute question proposed.
11 rods in stem vice 10 would need to be corrected.

Does not match KA. KA interpreted by replacement KA in supplement 1. KA is based on 55.43 (6) and does not require 55.43 (2).
Recall too specific for closed reference. Even if candidate can work through TS application, final answer depends on recall of a specific detail in basis

RFA approved 10/24/2007
BLC comment that "D" does not specify where to leave the rod. Leaving the rod out while disarming it is not plausible. Licensee suggested the following choice for "D": "Verify rod 26-27 meets the required scram times. If acceptable, no further RAS action are required."

Tier:	3	Group:	2
Keyword:	CRDM	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

98. G2.3.9 001/3/3/CONTAINMENT/NEW/HIGHER/HT2007-301/SRO/BLC/RFA

Unit 2 is shutting down and is at 30% reactor power.

Which ONE of the following describes the limitations for purging (de-inerting) the primary containment in accordance with Tech Specs and procedure 34SO-T48-002-2, Containment Atmospheric Control and Dilution System?

[Reference provided]

A. De-inerting may commence 24 hours prior to reducing thermal power to less than 15%.

   Torus purge valves (2T48-F309, 2T48-F324) and drywell purge valves (2T48-F307, 2T48-F308) may be open at the same time.

B. ✓ De-inerting may commence 24 hours prior to reducing thermal power to less than 15%.

   Torus purge valves (2T48-F309, 2T48-F324) and drywell vent valves (2T48-F319, 2T48-F320) may be open at the same time.

C. De-inerting may commence no earlier than 24 hours after thermal power is less than 15%.

   Torus purge valves (2T48-F309, 2T48-F324) and drywell purge valves (2T48-F307, 2T48-F308) may NOT be open at the same time.

D. De-inerting may commence no earlier than 24 hours after thermal power is less than 15%.

   Torus purge valves (2T48-F309, 2T48-F324) and drywell vent valves (2T48-F319, 2T48-F320) may NOT be open at the same time.

Applicant Reference: Provide T23-PC-LP-01301, Containment Lesson Plan, Figure 6, without any of the accompanying footnotes.

Updated 11/21/07 RSG/CME

A. First statement is correct TS limit. Second statement is incorrect, but plausible if applicant does not recognize this configuration could result in drywell steam entering torus air space.

B. Correct.

C. First statement is incorrect, but plausible if applicant does not recall that de-inerting may commence 24 hours prior to 15%. Second statement is correct.

D. Same analysis as C for first statement. Second statement is incorrect, but plausible if applicant does not recognize that this method is allowed by procedure.

SRO only because tied to 10CFR55.43(4): K/A G2.3.9
SRO only because tied to Shift Supervisor responsibilities.
2.3.9 Knowledge of the process for performing a containment purge. (CFR: 43.4 / 45.10) IMPORTANCE 2.5 / 3.4

References
31GO-OPS-005-0, Primary Containment Entry procedure
34SO-T48-002-2, CAC/CAD system operating procedure

Edit question.
Recall required is too specific for closed reference. Tests applicant memory of one or two samples being required. Question changed.

Need to edit plausibility distracter analysis.

RFA Approved 10/24/2007

Tier:	3	Group:	3
Keyword:	CONTAINMENT	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

99. G2.4.11 001/3/3/SHUTDOWN CLG/NEW/HIGHER/HT2007-301/SRO/BLC/RFA

Unit 2 was in Mode 4 with the following conditions:

- "A" loop of RHR operating in shutdown cooling
- Reactor Coolant temp 180 deg F
- Both Recirc pumps under clearance out of service

Following a trip and reset of an RPS MG set, the control room operator is unable to re-open the outboard shutdown cooling isolation valve (2-E11-F009). All local efforts to manually open this valve have not been succesful.

Given these conditions, which ONE of the following defines the term "boil off time" in accordance with 34AB-E11-001-2, Loss of Shutdown Cooling and also identifies the required actions, if any, in accordance with Tech Spec 3.4.8, RHR Shutdown Cooling System - Cold Shutdown?

A. "Boil-off time" is the time from when the loss of shutdown cooling occurred until the time water level reaches TAF.

   Verify an alternate method of decay heat removal is available within 1 hour. Ambient heat losses can be considered as, or contributing to, the alternate method.

B. "Boil-off time" is the time from when the loss of shutdown cooling occurred until the time 212 deg F is reached.

   Verify an alternate method of decay heat removal is available within 1 hour. Ambient heat losses can be considered as, or contributing to, the alternate method.

C. "Boil-off time" is the time differential between the time of complete loss of shutdown cooling and the time water level reaches TAF.

   No tech spec action is required, LCO conditions are currently met.

D. "Boil-off time" is the time differential between the time of complete loss of shutdown cooling and the onset of boiling.

   No tech spec action is required, LCO conditions are currently met.

Note: (definitions)

Saturation time is the time differential between the time of complete loss of shutdown cooling and the onset of boiling

Boil-off time is the time differential between the time of complete loss of shutdown cooling and the time water level reaches the top of fuel.

Evaporation time is the time differential between saturation time and the boil-off time.

A. Correct.

B. Incorrect because this is the definition (according to the AOP) for "saturation time." Plausible if applicant does not know the AOP terminology.

C. Incorrect because the LCO conditions are not met and required action A and B must be met. Plausible if applicant mis-interprets the allowance for both RHR subsystems and recirc pumps to be removed from operation for up to 2 hours per 8 hour period.

D. Incorrect because this is the definition (according to the AOP) for "saturation time." Also incorrect because the LCO conditions are not met and required action A and B must be met. Plausible if applicant does not know the AOP terminology or mis-interprets the allowance for both RHR subsystems and recirc pumps to be removed from operation for up to 2 hours per 8 hour period.

SRO-only due to the link to 10CFR55.43 (2): Tech Specs
G2.4.11 Knowledge of abnormal condition procedures. (CFR: 41.10 / 43.5 / 45.13) IMPORTANCE 3.4 / 3.6

References
Tech Spec 3.4.8, RHR Shutdown Cooling System - Cold Shutdown (including bases)
34AB-E11-001-2, Loss of Shutdown Cooling AOP

RFA Approved 10/24/2007

Tier:	3	Group:	3
Keyword:	SHUTDOWN CLG	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA

100. G2.4.26 001/3/4/FIRE BRIGADE/NEW/FUND/HT2007-301/SRO/BLC/RFA

Which ONE of the following describes the MINIMUM required number of fire brigade members, including their assignment limitations?

A. 4 members + 1 leader (total of 5)
Personnel assigned to the fire brigade CAN also be used to fulfill the minimum shift crew composition requirements as defined by plant Tech Specs.

B. 4 members + 1 leader (total of 5)
A minimum of three of these persons must have competent knowledge of safety-related systems and components.

C. 5 members + 1 leader (total of 6)
Personnel assigned to the Fire Brigade can NOT be used to fulfill the minimum shift crew composition requirements as defined by Tech Specs.

D. 5 members + 1 leader (total of 6)
A minimum of three of these persons must have competent knowledge of safety-related systems and components.

A. Incorrect because fire brigade members cannot be used to fulfill tech spec crew composition req'ts. Plausible since system operators can be fire brigade members; only 3 required by tech specs for system operators only..normal shift may have 6 or 7 system operators.

B. Correct.

C. Incorrect because only 5 total are required. Plausible if applicant thinks that the fire brigade leader is in addition to the fire brigade.

D. Incorrect because only 5 total are required. Plausible if applicant thinks that the fire brigade leader is in addition to the fire brigade.

SRO only because of tie to 10CFR55.43(1): Conditions and limitations in the facility license.

2.4.26 Knowledge of facility protection requirements including fire brigade and portable fire fighting equipment usage. (CFR: 43.5 / 45.12) IMPORTANCE 2.9 / 3.3

References
30AC-OPS-003-0, Plant Operations
40AC-ENG-008-0S, Fire Protection Program
10CFR50.48, Fire Protection
RFA Approved 10/24/2007

Tier:	3	Group:	4
Keyword:	FIRE BRIGADE	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	SRO	Author/Reviewer:	BLC/RFA