

Draft Submittal
(Pink Paper)

Reactor Operator Written Exam

HATCH DECEMBER 2007 EXAM

05000321/2007301 AND 05000366/2007301

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

QUESTIONS REPORT

for RO

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

While performing the Control Rod Weekly Exercise, 34SV-C11-003-1/2, at 85% power, the operator selects a centrally located rod which exceeds the Rod Block Monitor (RBM) setpoint. (no rod movement was initiated)

Which ONE of the following describes the reactor manual control system status AFTER this rod was selected?

- A. NONE of the four lights above the rod movement control switch are illuminated. Only **RBM UPSCALE OR INOPERATIVE** alarm was received. NO other alarms were received.
- B. NONE of the four lights above the rod movement control switch are illuminated. **RBM UPSCALE OR INOPERATIVE** alarm was received. **ROD OUT BLOCK** alarm was received.
- C. ONE of the four lights above the rod movement control switch is illuminated. Only **RBM UPSCALE OR INOPERATIVE** alarm was received. NO other alarms were received.
- D. ONE of the four lights above the rod movement control switch is illuminated. **RBM UPSCALE OR INOPERATIVE** alarm was received. **ROD OUT BLOCK** alarm was received.

A. Incorrect because a Rod Out Block alarm will also be received. Plausible if applicant does not know this alarm input.

B. Correct.

C. Incorrect because at this point, none of the lights will be illuminated (settle bus, insert bus, withdraw bus, or withdraw permissive). Also incorrect because both RBM upscale and Rod Out Block alarms will be received. Plausible if applicant knows one of the alarms that RBM triggers.

D. Incorrect because at this point, none of the lights will be illuminated (settle bus, insert bus, withdraw bus, or withdraw permissive). Plausible if applicant does not know the names of the lights and thinks that one comes on with a rod is selected.

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

QUESTIONS REPORT
for RO

Tier: 2
Keyword: RBM
Cog Level: HIGHER
Test: RO

Group: 2
Source: NEW
Exam: HT2007-301
Author/Reviewer: BLC/RFA

QUESTIONS REPORT

for RO

2. 202001A2.07 001/2/2/RECIRC/NEW/FUND/HT2007-301/RO/BLC/RFA

While the unit is operating at 100% power, the operator inadvertently places the "A" recirc pump suction valve (B31-F023A) control switch to the close position, but immediately releases the switch after he recognizes his mistake.

Which ONE of the following predicts how the recirc pump speed control system will respond and also identifies the recovery actions necessary to restart the recirc pump?

- A. A speed signal failure alarm will occur.
The scoop tube lock must be reset and the runback pushbutton must be depressed.
- B. A speed signal failure alarm will occur.
The scoop tube lock must be reset. The runback pushbutton is NOT required to be depressed.
- C. A speed signal failure alarm will NOT occur.
The indicated speed demand on the pump's controller will lower to 55% after the pump trips and the controller must be placed in MANUAL.
- D. A speed signal failure alarm will NOT occur.
The indicated speed demand on the pump's controller will remain at the value that existed before the pump trip and the controller must be placed in MANUAL.

A. Correct.

B. Incorrect because in order to clear the speed controller failure alarm, the runback pushbutton is depressed. Plausible if applicant knows that the suction valve does not cause a runback (vs discharge valve)

C. Incorrect because when the drive motor breaker trip occurs, a mismatch between speed (0%) and speed demand occurs which will be greater than 7% delta, which causes a speed controller failure alarm AND scoop tube lock. Plausible if the applicant does not know the 7% threshold for a signal failure alarm and knows that the speed demand does actually lower to 44% following a pump trip.

D. Incorrect because when the drive motor breaker trip occurs, a mismatch between speed (0%) and speed demand occurs which will be greater than 7% delta, which causes a speed controller failure alarm AND scoop tube lock. Plausible if the applicant does not know the 7% threshold for a signal failure alarm and does not know that the speed demand changes following a pump trip, i.e., the applicant reasons that actual speed changes but speed demand remains the same.

QUESTIONS REPORT
for RO

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

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

QUESTIONS REPORT

for RO

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:

1-B31-R620, Master Recirc Flow Control: MANUAL

1-B31-R621A, Pump A Speed Control: MANUAL

1-B31-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

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 Vital AC Instrument Bus "A" (R25-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.

A. Incorrect because this would also result in the "B" signal failure annunciator. Plausible if applicant thinks that master controller was 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 and these two alarms would 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

QUESTIONS REPORT
for RO

Tier: 2
Keyword: RECIRC
Cog Level: HIGHER
Test: RO

Group: 2
Source: NEW
Exam: HT2007-301
Author/Reviewer: BLC/RFA

QUESTIONS REPORT

for RO

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"
- Drywell pressure 2 psig
- 1R24-S018A is de-energized.

Which ONE of the following describes how the LPCI system will respond if reactor pressure lowers to 200 psig?

- A. LPCI Loop 1 and 2 will both inject.
- B. LPCI Loop 1 will be dead-headed.
LPCI Loop 2 will inject.
- C. LPCI Loop 1 will NOT inject but will be running on minimum flow.
LPCI Loop 2 will inject.
- D. Neither LPCI Loop will inject.

A. Incorrect because Loop 1 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 1 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 2 is unaffected. Plausible if applicant does not know the initiation logic or thinks that the valve power supplies are unaffected.

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.

Tier: 2

Group: 1

Keyword: LPCI

Source: NEW

Cog Level: HIGHER

Exam: HT2007-301

Test: RO

Author/Reviewer: BLC/RFA

QUESTIONS REPORT

for RO

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

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

QUESTIONS REPORT

for RO

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

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 immediately inject.
- B. HI REACTOR WATER LEVEL TRIP RESET pushbutton, HPCI will NOT re-start at this time.
- C. INITIATION SIGNAL RESET pushbutton, HPCI will re-start but NOT inject at this time.
- D. INITIATION SIGNAL RESET pushbutton, HPCI will re-start and immediately inject.

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

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

QUESTIONS REPORT
for RO

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

Which ONE of the following describes the 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

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

QUESTIONS REPORT

for RO

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

Both units are operating at 100% power. At the completion of the 34SV-E21-001-1/2, Core Spray Pump Operability Surveillance, the second party verification operator independently observes the following control board indications:

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

Which ONE of the following describes the required standby lineup and the valve logic?

A. The current lineup is correct.

The min flow valve can be opened; however it will auto-close after it reaches the full open position.

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.

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.

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 since the min flow valve logic works as described.

B. Correct.

C. Incorrect because the F004 and F005 positions are backwards. Plausible if applicant does not know the required standby lineup.

D. Incorrect because the min flow valve should be open. Plausible if applicant knows the discharge valve position requirements but not the logic on the min flow valve.

QUESTIONS REPORT for RO

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

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

QUESTIONS REPORT

for RO

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

Due to an electrical transient, 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

Tier: 2
Keyword: SLC
Cog Level: FUND
Test: RO

Group: 1
Source: BANK MOD
Exam: HT2007-301
Author/Reviewer: BLC/RFA

QUESTIONS REPORT
for RO

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

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

<u>TRIP STATUS/MTU</u>	<u>STATUS/MTU</u>	<u>GROSS FAIL/MTU</u>	<u>POWER ON/P925</u>
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)

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).

D. Incorrect because the trip unit status light is green (vs red) and the power supply status light is clear (vs green).

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

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

QUESTIONS REPORT
for RO

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

Which ONE of the following describes the **UNIT 1** reactor protection system (RPS) manual scram logic?

- A✓ The manual scram pushbutton will NOT de-energize an automatic scram channel. There are the same number of shorting links as compared to the other unit.
- B. A manual scram pushbutton will de-energize an automatic scram channel. There are the same number of shorting links as compared to the other unit.
- C. The manual scram pushbutton will NOT de-energize an automatic scram channel. There are four less shorting links compared to the other unit.
- D. A manual scram pushbutton will de-energize an automatic scram channel. There are four less shorting links compared to the other unit.

A. Correct.

B. Incorrect because manual scram pushbutton on U1 does not input to the auto-scam channels. Plausible if applicant does not know unit difference.

C. Incorrect because there are the same number of shorting links on U1 and U2. Plausible since U2 has four manual scram pushbuttons.

D. Incorrect because manual scram pushbutton on U1 does not input to the auto-scam channels. Also incorrect because there are the same number of shorting links on U1 and U2. Plausible since U2 has four manual scram pushbuttons. Plausible if applicant does not know unit difference.

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

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

QUESTIONS REPORT

for RO

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

During a startup the 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 ~ 30. 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 on the 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.

QUESTIONS REPORT
for RO

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.

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

QUESTIONS REPORT
for RO

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

A Unit 2 startup from a refueling outage is in progress with the following conditions:

Reactor power ~ 1%, IRMs on range 8 and 9
Reactor pressure at 200 psig.

(Assuming that the SRM/IRM detector selection power is still ON) Which ONE of the following is correct for the source range monitor (SRM) detector position and period indication?

- A. Retract permit light is extinguished.
Changes in the SRM period indication reflect actual core neutron flux changes.
- B. Retract permit light is extinguished.
Changes in the SRM period indication do NOT reflect actual core neutron flux changes.
- C. Retract permit light is illuminated.
Changes in the SRM period indication do NOT reflect actual core neutron flux changes.
- D. Retract permit light is illuminated.
Changes in the SRM period indication reflect actual 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

QUESTIONS REPORT
for RO

Tier: 2
Keyword: SRM
Cog Level: HIGHER
Test: RO

Group: 1
Source: NEW
Exam: HT2007-301
Author/Reviewer: BLC/RFA

QUESTIONS REPORT

for RO

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 the panel H11-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 LPRM will change the LCO limit value.

D. Incorrect because thermal limit values should rise to approach 1. Plausible if applicant thinks that the LPRM will change the LCO limit value.

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

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

QUESTIONS REPORT

for RO

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

After a dual feed pump trip from rated conditions, RCIC and CRD are in operation. Reactor water level is at -38 inches and is stable. RCIC is injecting to the vessel 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.
The discharge pressure indicates a possible pipe break.

A. Incorrect because the pump discharge pressure should be equivalent to the turb steam inlet pressure, i.e., reactor pressure. Also incorrect because reducing RCIC pump flow below its rated condition of 400 gpm with the flow controller in automatic may cause system instability. Transferring the flow controller to MANUAL AND adjusting its 'speed demand' output may be required to stabilize control capability. Plausible since the system procedure warns that continued operation at turbine speeds < 2000 rpm can cause check valve problems.

B. Incorrect because the pump discharge pressure should be equivalent to the turb steam inlet pressure, i.e., reactor pressure. Plausible since the system procedure warns that continued operation at turbine speeds < 2000 rpm can cause check valve problems.

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.

QUESTIONS REPORT
for RO

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

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

QUESTIONS REPORT

for RO

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

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 ~ 13 minutes have elapsed.
- B. ADS will initiate as soon as ~ 2 minutes have elapsed.
- C. ADS will NOT initiate because the low pressure pump permissive is not satisfied.
- D. ADS will NOT initiate because the drywell pressure permissive is not satisfied.

A. Incorrect because the low pressure pump permissive is not satisfied. The only low pressure ECCS pump that's running is 2B RHR pump. ADS logic requires at least two RHR pumps or one Core Spray pump. Plausible if applicant does not know the pump power supplies, but knows that the drywell pressure bypass timer is required.

B. Incorrect because the low pressure pump permissive is not satisfied. The only low pressure ECCS pump that's running is 2B RHR pump. ADS logic requires at least two RHR pumps or one Core Spray pump. Plausible if applicant does not know the pump power supplies and thinks that the drywell pressure permissive is satisfied.

C. Correct.

D. Incorrect because the reason ADS won't initiate is because the low pressure pump permissive is not satisfied. Plausible if applicant does not know pump power supplies and does not know that a drywell pressure bypass timer exists.

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

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

QUESTIONS REPORT

for RO

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

An ATWS has occurred with the following conditions:

APRM power ~ 4%

MSIVs open; EHC controlling pressure 900 - 1000 psig

No SRVs are open

Drywell pressure 1 psig, steady

RPV level is being controlled -65" to -75" in accordance with CP-3

Both loops of RHR were placed in torus cooling using the placard posted at H11-P601 while these plant conditions existed (i.e., the containment spray valve control and 2/3 core height override switches were not used.)

While the rods are being inserted and boron is being injected, a group 1 isolation occurs. The SRO orders that RPV level be lowered to -150".

Which ONE of the following predicts how the E11-F028 (torus isolation) and E11-F024 (torus cooling) valves will respond when RPV level reaches -150", including required actions (if any)?

A✓ Both valves auto-closed.

If ONLY the containment spray valve control switch is placed in the MANUAL position, THEN the E11-F028 valve will automatically re-open. (E11-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 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 E11-F028 valve auto-closed. The E11-F024 valve remained open.

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

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

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

QUESTIONS REPORT
for RO

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.

D. Incorrect because both valves auto-closed. Plausible if applicant thinks that only the downstream throttle valve has the auto-closure logic.

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

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

QUESTIONS REPORT

for RO

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

Unit 2 was starting up at 20 % power. The turbine generator had just been synchronized to the grid when a loss of main condenser vacuum resulted in an automatic reactor scram.

Which ONE of the following predicts 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

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

QUESTIONS REPORT
for RO

Tier: 2
Keyword: PCIS
Cog Level: HIGHER
Test: RO

Group: 1
Source: NEW
Exam: HT2007-301
Author/Reviewer: BLC/RFA

QUESTIONS REPORT

for RO

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

Unit 1 is in Mode 4 with the following conditions:

"2B" 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.

QUESTIONS REPORT
for RO

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

Tier: 2

Group: 1

Keyword: PCIS

Source: NEW

Cog Level: HIGHER

Exam: HT2007-301

Test: RO

Author/Reviewer: BLC/RFA

QUESTIONS REPORT
for RO

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

Which ONE of the following describes the RHR piping keepfill system and the containment spray piping?

- A. If the water level in the spray line piping drops, then an annunciator will alarm in the control room.

The section of piping between the containment spray outboard valve (E11-F016) and inboard valve (E11-F021) is maintained full of water by the keepfill system.

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

The section of piping between the containment spray outboard valve (E11-F016) and inboard valve (E11-F021) 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 containment spray outboard valve (E11-F016) and inboard valve (E11-F021) 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 containment spray outboard valve (E11-F016) and inboard valve (E11-F021) is maintained full of water by the keepfill system.

QUESTIONS REPORT
for RO

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

QUESTIONS REPORT

for RO

21. 233000G2.4.50 001/2/2/FUEL POOL/NEW/FUND/HT2007-301/RO/BLC/RFA

Which ONE of the following fuel pool transfer canal pneumatic seals does the following annunciator pertain to and what is the status of this alarm when refueling is in progress?

FPC SYS GATE SEALS LEAKING (654-006)

- A. Fuel pool to transfer canal gate seals; This is NOT a normal alarm when the fuel pool gates are removed and the cavity is flooded.
- B. Fuel pool to transfer canal gate seals; This IS a normal alarm when the fuel pool gates are removed and the cavity is flooded.
- C. Fuel pool transfer canal transition piece seals; This IS a normal alarm when the fuel pool gates are removed and the cavity is flooded.
- D. Fuel pool transfer canal transition piece seals; This is NOT a normal alarm when the fuel pool gates are removed and the cavity is flooded.

A. Incorrect because this is a normal alarm when the fuel pool gates are removed and the cavity is flooded. Plausible if applicant knows the component but does not understand the level detection circuit.

B. Correct.

C. Incorrect because there are separate alarms for the transition piece seals. Also incorrect because this is a normal alarm when the fuel pool gates are removed and the cavity is flooded. Plausible if applicant does not know the difference between the two canals, i.e., one between the fuel pool and RPV and the other canal between unit 1 and 2.

D. Incorrect because there are separate alarms for the transition piece seals. Plausible if applicant does not know the difference between the two canals, i.e., one between the fuel pool and RPV and the other canal between Unit 1 and 2.

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-654-006-1, FPC Gate Seals Leaking annunciator procedure
34AR-654-051-1, Fuel Pool Xfer Canal Bladder Air Press Low annunciator procedure

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

QUESTIONS REPORT

for RO

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 identifies the reason for opening SRVs until reactor pressure is below 960 psig using the sequence?

"Cycling" does NOT include SRV.....

- A. actuation due to the backup electrical relief setpoint. The Table 1 opening sequence is required to evenly distribute cycles on the SRVs and to prevent localized heating in the torus.
- B. actuation due to the backup electrical relief setpoint. Pressure is stabilized at a value below the high RPV pressure scram setpoint to permit the scram logic to be reset.
- C. low level set actuation. The Table 1 opening sequence is required to evenly distribute cycles on the SRVs and to prevent localized heating in the torus.
- D. low level set actuation. Pressure is stabilized at a value below the high RPV pressure scram setpoint to permit the scram logic to be reset.

A. Incorrect because cycling includes mechanical and electrical setpoint cycling. Plausible if applicant thinks that electrical means low level set cycling.

B. Incorrect because cycling includes mechanical and electrical setpoint cycling. Also incorrect because this is the basis for stabilizing pressure at 1074 psig (next step in flowchart). Plausible if applicant thinks that electrical means low level set cycling or if applicant confuses the basis for 1074 psig step.

C. Correct.

D. Incorrect because this is the basis for stabilizing pressure at 1074 psig (next step in flowchart). Plausible if applicant thinks that electrical means low level set cycling or if applicant confuses the basis for 1074 psig step.

QUESTIONS REPORT

for RO

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

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

QUESTIONS REPORT

for RO

23. 245000K3.05 001/2/2/FEEDPUMP/NEW/HIGHER/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 main turbine and the reactor feedpumps steam inlet control valves?

- A. Main turbine trip
The feedpump HP control valve will open.
- B. Main turbine trip
The feedpump LP control valve will open and the HP control valve will close.
- C. Main turbine does NOT trip
The feedpump HP control valve remains open.
- D. Main turbine does NOT trip
The feedpump LP control valve remains open.

A. Correct.

B. Incorrect because the HP control valve (from main steam) will open as low pressure steam (from crossover piping) diminishes. 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 (10 sec time delay), at 2.5 inches below the MSR shell. Also incorrect because the HP control valve was previously closed and now auto-opens. Plausible if applicant thinks that more than one MSR high level is required to satisfy the turbine trip logic or is not sure of the normal and alternate source of feedpump steam.

D. Incorrect because the turbine will trip on high moisture separator level (10 sec time delay), at 2.5 inches below the MSR shell. Plausible if applicant thinks that more than one MSR high level is required to satisfy the turbine trip logic or is not sure of the normal and alternate source of feedpump steam.

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

QUESTIONS REPORT

for RO

Tier: 2
Keyword: FEEDPUMP
Cog Level: HIGHER
Test: RO

Group: 2
Source: NEW
Exam: HT2007-301
Author/Reviewer: BLC/RFA

QUESTIONS REPORT

for RO

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 Level 2.

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.

A. Incorrect because HPCI and RCIC both tap into FW lines DOWNSTREAM of flow indicators. Plausible if applicant does not know the injection path.

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 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

QUESTIONS REPORT

for RO

Tier: 2

Keyword: RCIC

Cog Level: HIGHER

Test: RO

Group: 2

Source: NEW

Exam: HT2007-301

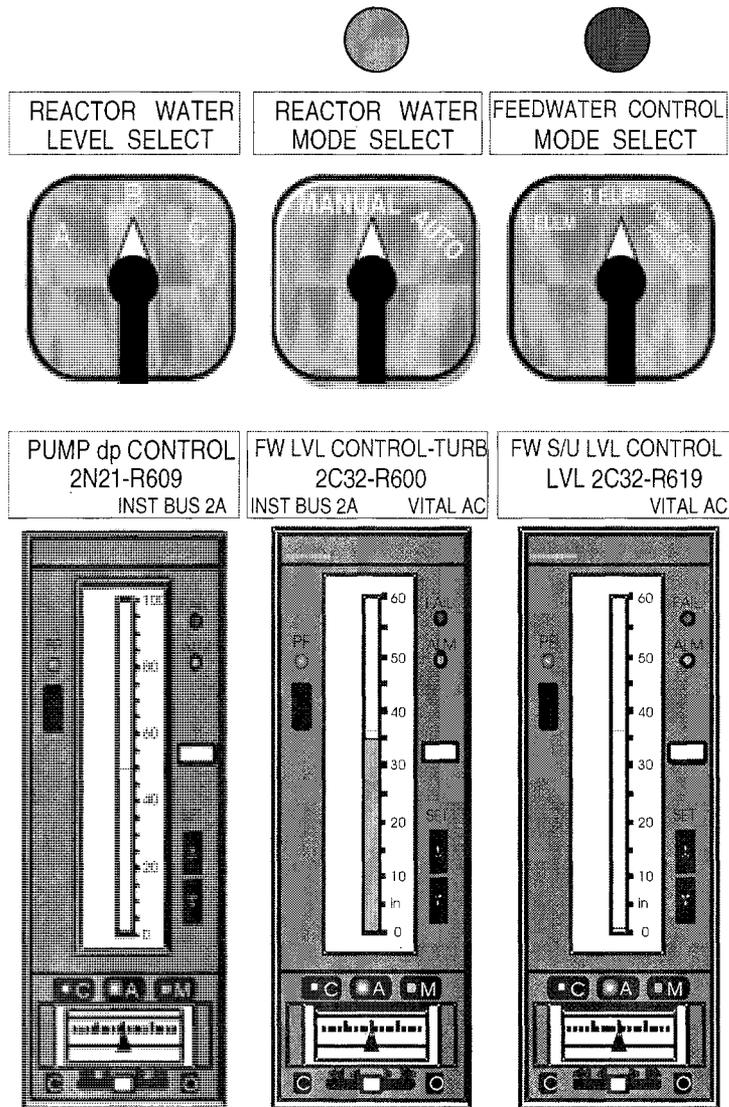
Author/Reviewer: BLC/RFA

QUESTIONS REPORT

for RO

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:



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?

QUESTIONS REPORT

for RO

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 the applicant thinks that the system is in manual based on the reactor water mode select switch position.

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 if the applicant thinks that the system is in manual based on the reactor water mode select switch position.

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

QUESTIONS REPORT
for RO

Tier: 2
Keyword: FWLC
Cog Level: HIGHER
Test: RO

Group: 1
Source: BANK MOD
Exam: HT2007-301
Author/Reviewer: BLC/RFA

QUESTIONS REPORT

for RO

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

Unit 2 is operating at 100% 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
FEEDWATER CONTROL SYSTEM TROUBLE will NOT alarm
- B. FEEDWATER CONTROL SYSTEM TROUBLE will alarm
REACTOR LEVEL CONTROL VALVE LOCKED will NOT alarm
- C. REACTOR LEVEL CONTROL VALVE LOCKED and FEEDWATER CONTROL SYSTEM TROUBLE will BOTH alarm
- D. REACTOR LEVEL CONTROL VALVE LOCKED will NOT alarm.
FEEDWATER CONTROL SYSTEM TROUBLE will NOT alarm.
Minimum flow protection for condensate and feedwater pumps will be lost.

A. Correct.

B. Incorrect because FW Ctl System alarm only comes in when a loss of power or sensor failure occurs. Also incorrect because S/U level control valve alarm will come in despite the fact that this valve is not being used. Plausible if applicant knows that S/U level valve is not being used and thinks that the loss of air will affect the controller outputs.

C. Incorrect because ONLY the S/U level locked alarm will be received. Plausible if applicant thinks that the S/U level valve being locked will cause a problem in the feedwater control system.

D. Incorrect because the S/U level valve locked alarm will occur. Also incorrect because all the min flow valves in the condensate and feedwater system will fail open. Plausible if applicant knows that S/U level valve is not being used and that the FW ctl system alarm occurs only on a loss of power or sensor failure.

QUESTIONS REPORT
for RO

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

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

QUESTIONS REPORT

for RO

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

A LOCA has occurred on Unit 2. Based on hydrogen and oxygen concentrations, the SRO has entered leg G-1 of the primary containment gas control flowchart.

The operators are venting the torus and purging the drywell with nitrogen in accordance with 31EO-EOP-104-2, Primary Containment Venting for Hydrogen and Oxygen Control.

Which ONE of the following describes the SBGT lineup and also identifies when the vent and purge operation is required to be secured?

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

Vent & purge is required to be stopped when drywell and torus O₂ levels are < 5% AND no H₂ is detected anywhere in containment.

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

Vent & purge is required to be stopped ONLY when the projected peak TEDE reaches 1000 mR/hr.

C✓ SBGT is running with a suction from either the refuel floor OR reactor building.

Vent & purge is required to be stopped when drywell and torus O₂ levels are < 5% AND no H₂ is detected anywhere in containment.

D. SBGT is running with a suction from either the refuel floor OR reactor building.

Vent & purge is required to be stopped ONLY when the projected peak TEDE reaches 1000 mR/hr.

A. Incorrect because SBGT is aligned to either the refuel floor or reactor building. Plausible if applicant does not understand the vent procedure.

B. Incorrect because SBGT is aligned to either the refuel floor or reactor building. Also incorrect because the 1000 mr/hr TEDE value only applies to leg G-2. Plausible if applicant does not know the vent procedure flow path. Also plausible since 0.57 mR/hr TEDE is ONE of the overrides at E2 in the G-1 leg.

C. Correct.

D. Incorrect because the 1000 mr/hr TEDE value only applies to leg G-2. Plausible since projected peak TEDE is ONE of the overrides at E2 in the G-1 leg at which venting and purging is required to be secured.

QUESTIONS REPORT
for RO

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

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

QUESTIONS REPORT

for RO

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.

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 on Unit 2 only

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

Tier: 2

Group: 1

Keyword: AC-DC

Source: NEW

Cog Level: HIGHER

Exam: HT2007-301

Test: RO

Author/Reviewer: BLC/RFA

QUESTIONS REPORT

for RO

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

Unit 2 is operating at 100% power when a loss of Vital AC R25-S063 occurs. Which ONE of the following describes how this power loss affects the main turbine?

- A. The turbine will NOT trip. All the 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

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

QUESTIONS REPORT

for RO

30. 263000G2.1.29 001/2/1/DC LINEUP/NEW/FUND/HT2007-301/RO/BLC/RFA

While performing a system operating procedure (SOP) electrical lineup, the operator reaches the following component on the electrical lineup checklist and identifies that breaker # 6 is already in the "ON" position:

1R25-S002 125V DC Cabinet 1B 130TET11

CHECKED/ VERIFIED

BRKR 6 Channel B RHR Relay Logic (E11 System) CLOSED ____ / ____

Which ONE of the following describes how the required verification activities, if any, are required to be completed in accordance with 34GO-OPS-003-2, Startup System Status Checklist?

- A. Verification requires two people; the performer and the independent verifier are required to be separated by both time AND distance.
- B. This breaker does NOT require independent or concurrent verification at this time.
- C. Verification requires two people; two individuals are required be present, directly observing the breaker.
- D. The **RHR RELAY LOGIC B POWER FAILURE** (601-205) control room annunciator is required to be verified extinguished but can be the same person or a different individual.

A. Incorrect because no component manipulation is involved iaw 34GO-OPS-003-2. Plausible if applicant does not know admin requirements.

B. Correct.

C. Incorrect because no component manipulation is involved iaw 34GO-OPS-003-2. Plausible if applicant does not know admin requirements.

D. Incorrect because indirect observation is not required since no component manipulation is involved iaw 34GO-OPS-003-2. Plausible since this breaker does cause the alarm if turned OFF and applicant thinks that indirect observation is allowed and required.

QUESTIONS REPORT

for RO

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

34GO-OPS-003-2, Startup System Status Checklist

34SO-E11-010-1, Attachment 2, RHR System Electrical Lineup checksheet

34SO-R42-001-1, 125VDC and 125/250VDC System operating procedure

10AC-MGR-019-0, Procedure Use and Adherence administrative procedure

34-AR-601-205-1, RHR Relay Logic B Power Failure annunciator procedure

Tier: 2

Group: 1

Keyword: DC LINEUP

Source: NEW

Cog Level: FUND

Exam: HT2007-301

Test: RO

Author/Reviewer: BLC/RFA

QUESTIONS REPORT

for RO

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

A loss of offsite power occurred on Unit 2 and now offsite power has been re-established via SAT 2C. The following conditions currently exist:

Diesel generator is carrying 4160V bus 2E with ~ 1800 kw load

The control room operator is in the process of transferring power from the diesel to the normal power supply.

Which ONE of the following identifies the syncroscope direction and test switch position required to parallel and realign bus 2E to its normal 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 syncscope 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 syncscope 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.

QUESTIONS REPORT
for RO

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

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

QUESTIONS REPORT

for RO

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?

RHR Pump 2C is ...

- A. running and will trip and re-start 22 seconds after the loss of offsite power.
- B. NOT running and will NOT be running after the loss of offsite power.
- C. NOT running but will auto-start 12 seconds after the loss of offsite power.
- D. running but 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.

QUESTIONS REPORT for RO

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

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

QUESTIONS REPORT

for RO

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

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)

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

QUESTIONS REPORT

for RO

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

Core alterations are in progress on Unit 2 and 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:

	<u>RED LIGHT</u>	<u>READING</u>
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 OFF
The bundle is required to be lowered into either the core OR the fuel pool until an investigation is completed.
- B. MCREC auto-starts
The bundle is required to be lowered into the core OR the fuel pool until an investigation is completed.
- C. MCREC remains OFF
The bundle is required to be lowered back into the fuel pool only, until an investigation is completed. The bundle is not allowed to be lowered into the core.
- D. MCREC auto-starts
The bundle is required to be lowered back into the fuel pool only, until an investigation is completed. The bundle is not allowed to be lowered into the core.

QUESTIONS REPORT

for RO

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

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

Tier: 2

Group: 2

Keyword: RAD MON

Source: NEW

Cog Level: HIGHER

Exam: HT2007-301

Test: RO

Author/Reviewer: BLC/RFA

QUESTIONS REPORT

for RO

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
<input checked="" type="radio"/> 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 Treatment lesson plan

34SO-T46-001-1/2, SBGT system operating procedure

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

QUESTIONS REPORT

for RO

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

An 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 Treatment 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

for RO

Tier: 2
Keyword: HVAC
Cog Level: HIGHER
Test: RO

Group: 2
Source: NEW
Exam: HT2007-301
Author/Reviewer: BLC/RFA

QUESTIONS REPORT

for RO

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

During a Unit 2 startup, both Recirc Pump speeds were raised from minimum speed to 30% in accordance with 34GO-OPS-001-2, Plant Startup. 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 13.3 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. The recorder indication is misleading. The "A" jet pump loop flow is reverse flow and must be subtracted from the recorder flow to obtain the actual core flow rate.
- B. The "A" jet pump loop flow should be subtracted from the "B" jet pump loop flow to obtain the actual core flow rate.
- C✓ The A and B jet pump flows should be summed to obtain an accurate core flow value.
- D. The recorder core flow indication is correct since the circuitry is automatically subtracting the idle 2A jet pump loop reverse flow.

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 positive (i.e., not reverse)

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

QUESTIONS REPORT

for RO

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

QUESTIONS REPORT

for RO

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 has been disconnected and the 600V bus has just been re-energized from its normal supply. (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 about the non-essential load lockout.

QUESTIONS REPORT

for RO

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

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

QUESTIONS REPORT

for RO

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 power available lights on the TOP row at Panel H11-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 600 KV circuit breakers will work on ONE bus.
- D. One 600 KV 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

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

QUESTIONS REPORT

for RO

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

Unit 1 is operating at 19% power and the turbine generator was tied to the grid. The following parameters were noted during the performance of the Core Parameter Surveillance, 34SV-SUV-020-0:

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 just manually tripped 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 accommodate 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.

QUESTIONS REPORT for RO

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.

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

QUESTIONS REPORT

for RO

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 surveillance testing. The following conditions exist immediately after the scram occurred:

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 first 5 minutes of the scram?

- A. 1 bypass valve will be fully open
The required makeup exceeds the capacity of one CRD pump
- B. 1 bypass valve will be cycling between 0 - 50% open
The required makeup is within the capacity of one CRD pump
- C✓ 1 bypass valve will be cycling 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.

QUESTIONS REPORT for RO

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

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

QUESTIONS REPORT

for RO

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

Unit 2 is 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 actions?

- A. ✓ 1055 psig
SELECT Control --> **psi-load** screen and ensure reactor pressure is at 1045 psig.
- B. 1055 psig
SELECT Control --> **pressure transmitter** screen and ensure reactor pressure is at 1045 psig.
- C. 1065 psig
SELECT Control --> **psi-load** screen and ensure reactor pressure is at 1055 psig.
- D. 1065 psig
SELECT Control --> **pressure transmitter** screen and ensure reactor pressure is at 1055 psig.

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)

- A. Correct.
- B. Incorrect because this is the wrong HMI screen to adjust reactor pressure setpoint. Plausible because the title of the screen is associated with reactor pressure control inputs.
- C. Incorrect because this is well above the alarm setpoint. Plausible if applicant knows the reactor scram is 1074 psig.
- D. Incorrect because this is well above the alarm setpoint. Also incorrect because this is the wrong HMI screen to adjust reactor pressure setpoint. Plausible if applicant knows the reactor scram is 1074 psig. Plausible because the title of the screen is associated with reactor pressure control inputs.

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

QUESTIONS REPORT
for RO

Tier: 1
Keyword: DEHC
Cog Level: HIGHER
Test: RO

Group: 2
Source: NEW
Exam: HT2007-301
Author/Reviewer: BLC/RFA

QUESTIONS REPORT

for RO

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 2.

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
Suppression pool temperature at 105 °F; torus cooling not in service
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** LOSEP, 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

QUESTIONS REPORT
for RO

Tier: 1
Keyword: DW COOLING
Cog Level: HIGHER
Test: RO

Group: 2
Source: NEW
Exam: HT2007-301
Author/Reviewer: BLC/RFA

QUESTIONS REPORT

for RO

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

The HPCI Pump Operability surveillance test (34SV-E41-002-1) is in progress. The status of the torus temperature monitoring and cooling systems is:

1T47-R611.....Operable
1T47-R612.....Operable
1T48-R647..... INOPERABLE
SPDS..... Unavailable
"A" Loop RHR in torus cooling
Initial temperature just before the test was 80 °F

Given this instrumentation status, which ONE of the following is the correct criteria to determine when HPCI must FIRST be stopped to minimize heating of the suppression pool water?

A. HPCI must be stopped at the time when the following value **reaches 95 °F**:

$$\frac{(\text{Avg of upper region sensors}) + (\text{Avg of lower region sensors})}{2}$$

B. HPCI must be stopped at the time when the following value **reaches 105 °F**:

$$\frac{(\text{Avg of upper region sensors}) + (\text{Avg of lower region sensors})}{2}$$

C✓ HPCI must be stopped when the run time reaches 30 minutes.

D. HPCI must be stopped when the run time reaches 20 minutes.

A. Incorrect because the upper temperature average is not available from either the T48-R647 OR the SPDS. Also incorrect because torus avg temperature is allowed to go higher than 95°F during HPCI testing. Plausible since this is the normal formula used to obtain the avg torus temperature when SPDS or T48-R647 is available.

B. Incorrect because this formula cannot be used since the upper region sensor average is unavailable, i.e., T48-R647 recorder is inoperable. Plausible since the HPCI must be secured at 105°F.

C. Correct. Max run time in minutes = $[105 - T_{\text{initial}}] * 2$
This is based on surveillance procedures 34SV-E41-002-1 and 34SV-SUV-019-1

D. Incorrect because the maximum HPCI run time is 30 minutes. Plausible if applicant knows that the HPCI pump is recommended to be run for at least 20 minutes IAW the HPCI surveillance procedure special requirements 4.3.9.

QUESTIONS REPORT for RO

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

Tier: 1

Group: 2

Keyword: TORUS TEMP

Source: NEW

Cog Level: HIGHER

Exam: HT2007-301

Test: RO

Author/Reviewer: BLC/RFA

QUESTIONS REPORT

for RO

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 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)

Which ONE of the following valves is required to be closed in order to ensure a full scram does not occur?

- 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.

QUESTIONS REPORT

for RO

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

Tier: 1

Group: 2

Keyword: REACTIVITY

Source: NEW

Cog Level: HIGHER

Exam: HT2007-301

Test: RO

Author/Reviewer: BLC/RFA

QUESTIONS REPORT

for RO

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) alarms are illuminated

SRM Period (603-231) alarm is illuminated

APRM Downscale (603-228) alarm is extinguished

APRM ODAs at 11%

Which ONE of the following actions should be taken?

A Re-perform 31EO-EOP-113-2

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

C. Do not re-perform 31EO-EOP-113-2.
Stop raising RPV water level and maintain -34" as the upper level limit.

D. Do not re-perform 31EO-EOP-113-2.
Stop raising RPV water level and re-inject only if RPV level lowers to -60."

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.

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

QUESTIONS REPORT
for RO

Tier: 1
Keyword: ATWS
Cog Level: HIGHER
Test: RO

Group: 2
Source: NEW
Exam: HT2007-301
Author/Reviewer: BLC/RFA

QUESTIONS REPORT

for RO

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

The control room has been abandoned and 31-RS-OPS-001-1, Shutdown From Outside Control Room, is being implemented.

Which ONE of the following will correctly complete the statement below?

At the **Unit 1** remote shutdown panel 1H21-P173, reactor water level can be monitored using the _____ up to a level of _____.

- A. Fuel Zone Instrument; +60 "
- B. Normal Range Instrument; +60"
- C. Post Accident Instrument: -17"
- D. Floodup Instrument; +200"

U1 uses the post accident (fuel zone) at the main remote shutdown panel.
U2 uses the wide range at the main remote shutdown panel.

- A. Incorrect because the fuel zone instrument top of scale is -17". Plausible if the applicant does not know the fuel zone instrument range ends before +60".
- B. Incorrect because the fuel zone (i.e., post accident) instrument is used at the RSDP on Unit 1. Plausible if applicant does not know the instrument range/type at the U1 RSDP (versus U2)
- C. Correct (This is a unit difference)
- D. Incorrect because the fuel zone (i.e., post accident) instrument is used at the RSDP. Plausible if applicant does not know the instrument range/type at the U1 RSDP (versus U2).

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:

B11-RXINS-LP-04404, Reactor Vessel Instrumentation lesson plan
31RS-OPS-001-1, Unit 1 Shutdown from outside the control room procedure
C82-RSDP-05201, Remote Shutdown Panel lesson plan

On Unit 2 the Emergency Range Instrument (-150" to +60") is used at the RSDP. (Unit difference)

QUESTIONS REPORT

for RO

Tier: 1
Keyword: REMOTE SD
Cog Level: FUND
Test: RO

Group: 1
Source: NEW
Exam: HT2007-301
Author/Reviewer: BLC/RFA

QUESTIONS REPORT

for RO

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 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?

- A. Vent the drywell via the 2 " line and purge only the drywell with CAD
Secure the venting only if the projected TEDE reaches 0.057 mR/hr
- B. Vent the drywell via the 18" line and purge both the drywell AND torus with CAD
Secure the venting only if the projected TEDE reaches 1 R/hr
- C. Vent the torus via the 2" line and purge both the drywell AND torus with CAD
Secure the venting only if the projected TEDE reaches 0.057 mR/hr
- D. Vent the torus via the 18" line and purge only the torus with CAD
Secure the venting only if the projected TEDE reaches 1 R/hr

A. Incorrect because the preferred method of releasing is from the torus (due to scrubbing). Plausible if applicant knows that combustible gases are being created in the drywell and easiest method of removing is to release directly from the drywell.

B. Incorrect because the preferred method of releasing is from the torus (due to scrubbing). Plausible if applicant thinks that the larger pipe size will accommodate faster removal of the combustible gas. Also plausible since replacement nitrogen to both spaces (drywell and torus) will mitigate the combustible gas concentration quicker.

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

D. Incorrect because the 18" torus line is only used for ventilation (versus releases). Also incorrect because the termination criteria is from path G-2 (vs G-1). Plausible if applicant knows that the torus vent path ensures scrubbing and reasons that a larger pipe size will reduce combustible gas concentrations more quickly.

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

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

QUESTIONS REPORT

for RO

49. 295018AK2.02 007/1/1/RBCCW/NEW/FUND/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 perturbation which would necessitate concerns over PSW-to-RBCCW delta P.

QUESTIONS REPORT for RO

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

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

QUESTIONS REPORT

for RO

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

Which ONE of the following describes how a loss of ONLY the Interruptable Essential Instrument Air Header will affect plant pneumatic components?

- A. Demineralizer outlet valves will "lockup", i.e., valves fail as is.
- B. Hotwell makeup and reject valve will fail closed
- C. Resin transfer operations will not be possible, i.e., valves fail closed.
- D. Supply and exhaust fan dampers will fail closed

A. Incorrect because the demineralizer effluent valves are pneumatically supplied from the Non-essential instrument air header.

B. Correct. Unit 1 (F202/F200) and Unit 2 (F043/F038) makeup/reject valves will fail closed on a loss of air and are pneumatically supplied via the interruptible essential instrument air header.

C. Incorrect because resin transfer operations are pneumatically supplied from the plant service air header

D. Incorrect because the radwaste HVAC panels are pneumatically supplied from the non-essential instrument air header.

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.

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

QUESTIONS REPORT

for RO

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

Unit 1 is in Mode 4 preparing for startup with the following conditions:

- RHR Loop "A" 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 surveillance procedure 34SV-B31-001-1 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 RHR operation and coolant temperature?

- A. RHR flow will lower
RWCU and RHR water temperature will rise
- B. RHR flow will remain the same
RWCU and RHR water temperature will lower
- C. RHR flow will remain the same
RWCU temperature will rise but RHR water temperature will remain the same
- D. RHR flow will rise
RWCU temperature will remain the same but RHR water temperature will lower.

A. Incorrect because the RHR flow rate will not change. Plausible if applicant thinks that the discharge valve being open could divert RHR flow around the area that RHR flow is actually detected resulting in an RCS heatup.

B. Correct. The core region is currently not receiving forced flow (the core annulus area is only being cooled versus the fuel) and an inadvertent mode change could occur.

C. Incorrect because RWCU and RHR both take a suction off of the "A" Recirc Loop. Both of these system temperatures will lower when the annulus area is overcooled and the core area is undercooled. Plausible if applicant thinks that RWCU suction is different than RHR suction path.

D. Incorrect because RHR flow will not change and both RWCU and RHR temperatures will track together since they both take a suction from the "A" Recirc loop. Plausible if applicant thinks that discharge valve being open creates less resistance to RHR flow and therefore causes more cooling in the vessel.

QUESTIONS REPORT for RO

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

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

QUESTIONS REPORT
for RO

52. 295022AK2.07 001/1/2/CRD/NEW/FUND/HT2007-301/RO/BLC/RFA

Complete the following statement from the choices below.

Following a loss of both CRD pumps, the scram insertion time is _____ when the vessel is _____ as compared to when the vessel is _____.

(Accumulator pressure AND reactor pressure assist are both available.)

- A. shorter
1000 psig; 200 psig
- B. ✓ shorter
200 psig; 1000 psig
- C. longer
1000 psig; 800 psig
- D. longer
400 psig; 800 psig

A. Incorrect because scram time at 200 psig is ~ 1.6 seconds as compared to ~ 2.65 seconds at 1000 psig. Plausible if applicant thinks that the reactor pressure assist contributes to a shorter scram time.

B. Correct. (see explanation in "A").

C. Incorrect because scram insertion time is shorter at pressures above 800 psig due to the additional reactor pressure assist available. (At 800 psig, scram time is ~ 2.8 seconds compared to 2.6 seconds at 1000 psig.) Plausible if applicant thinks that higher reactor pressure creates more opposing force for rod insertion.

D. Incorrect because accumulator assist at lower reactor pressures results in the shortest scram times. (At 400 psig, scram time is ~ 2 seconds whereas at 800 psig, the scram time is ~ 2.7 seconds.) Plausible if applicant thinks that less reactor pressure assist results in a longer scram time.

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

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

QUESTIONS REPORT

for RO

53. 295023AK2.01 010/1/1/REFUELING/NEW/FUND/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.

QUESTIONS REPORT
for RO

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

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

QUESTIONS REPORT

for RO

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 exist:

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 will not be able to open and close the valves.
- C. The pneumatic operators on the safety relief valves will not be able to open and close the valves.
- D. After the drywell is vented in accordance with 31EO-EOP-101-1, Emergency Containment Venting, the RHR and Core Spray NPSH limits will be affected.

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

QUESTIONS REPORT

for RO

Tier: 1
Keyword: CONTAINMENT
Cog Level: HIGHER
Test: RO

Group: 1
Source: NEW
Exam: HT2007-301
Author/Reviewer: BLC/RFA

QUESTIONS REPORT

for RO

55. 295025EK1.03 012/1/1/SRV/NEW/HIGHER/HT2007-301/RO/BLC/RFA

A spurious group 1 isolation occurred on Unit 1 and systems responded as designed.

During the transient, the RPV pressure peaked at 1125 psig and the lowest pressure reached was 875 psig. The following conditions currently exist:

MSIVs closed; RPV pressure stable at 1000 psig

"Safety/Blowdown Valve Leaking" Annunciator in alarm; 4 amber lights are lit

Assuming no operator action, which ONE of the following is correct at the SRV Tailpipe Temperature recorder (B21-R614) located at panel H11-P614?

_____ tailpipe temperatures are ~ _____ deg F and stable.

- A. Two; 330
- B. Four; 330
- C. Nine 150
- D. Two; 450

A. Correct. Low Level set armed when reactor pressure surpassed 1074 psig and then four SRVs lifted at 1120 psig, i.e., four tailpipe pressures exceeded 85 psig. As pressure lowered to 875 psig, F013H and F013A closed. F013G and F013C remain open. Isenthalpic process pressure drop from 1000 psig to 125 psig (tailpipe discharge pressure) would be ~ 339 deg F.

B. Incorrect because two of the four low level set valves have reclosed; therefore their tailpipe temperatures would be trending down. 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 greater than the normal closed value of 150 deg. Plausible if applicant realizes that two SRVs are still open, i.e., 11-2=9

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.

QUESTIONS REPORT for RO

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

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

QUESTIONS REPORT

for RO

56. 295026EK1.02 014/1/1/TORUS TEMP/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Unit 2 is starting up per 34GO-OPS-001-2, Plant Startup, and surveillance procedure 34SV-E41-005-2, HPCI Pump Operability 165 psig Test, is in progress.

The following conditions exist due to sustained operation of HPCI:

TORUS WATER TEMP HIGH (654-020) in alarm
DRYWELL/TORUS RCDR R627 TEMP HIGH (650-204) in alarm
MULTIPOINT TEMP RCDR 2T47-R626 TEMP HIGH (657-025) in alarm

Both loops of suppression pool cooling are in service
Torus temperature monitoring per 34SV-SUV-019-2 is in progress
SPDS Display indicates bulk average torus temperature is 101°F and lowering

Given these conditions, which ONE of the following are the required actions?

- A. Immediately shutdown HPCI and terminate the test
Enter 31EO-EOP-012-2, PC-1, Primary Containment Control
- B. Immediately scram and terminate the test
Enter 31EO-EOP-012-2, PC-1, Primary Containment Control
- C Allow the HPCI test to continue
Continue in AOP 34AB-T23-003-2, Torus Temperature Above 95 °F
Enter 31EO-EOP-012-2, PC-1, Primary Containment Control
- D. Allow the HPCI test to continue
Continue in AOP 34AB-T23-003-2, Torus Temperature Above 95 °F
Do NOT enter 31EO-EOP-012-2, PC-1, Primary Containment Control

A. Incorrect because T.S. 3.6.2.1 conditions are still met when testing is in progress that adds heat to the torus. Plausible because LCO requires suspending HPCI operation when torus temp reaches 105 deg F.

B. Incorrect because T.S. 3.6.2.1 conditions are still met when testing is in progress that adds heat to the torus. Plausible because LCO requires the reactor be shutdown immediately when torus temp > 110 deg F. PC-1 should be entered for torus temp > 100 deg F.

C. Correct. T.S. 3.6.2.1 allows operation up to 105 deg due to testing which adds heat to the torus. AOP entry is appropriate and PC-1 entry is required above 100 deg F.

D. Incorrect because PC-1 entry is required. Plausible if applicant knows that T.S. allows testing which adds heat up to 105 deg.

QUESTIONS REPORT for RO

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

34AB-T23-003-2, Torus Temp Above 95 °F
34SV-E41-005-2, HPCI Pump Operability 165 psig Test
34SV-SUV-019-2, Surveillance Checks
T.S. 3.6.2.1 LCO & Bases, Suppression Pool Average Temperature
Annunciator response procedures listed in stem

Should not have PC-1 distributed...this identify the correct answer.

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

QUESTIONS REPORT

for RO

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 boron injection initiation temperature (BIIT) limit 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 SBLC per 34SO-C41-003-1

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 a manual scram per placard RC-1

D. Ensures the energy transferred from the RPV to the containment is within the capacity of the drywell vent valves T48-F320 and -F319.

Initiate a manual scram per placard RC-1

A. Incorrect because SBLC initiation is not performed to maintain torus temperature less than 110 deg F. Plausible since initiating SBLC is one action that is taken before BIIT is reached. Also, 110 deg F is associated with the torus temperature for HCTL

B. Incorrect because this action ensures HOT shutdown boron weight is injected before torus heat capacity is exceeded. Plausible since injecting SBLC is one action that is taken before BIIT is reached to ensure a lesser amount of boron is injected.

C. Correct

D. Incorrect because the basis for BIIT is not to ensure that the energy transfer is equivalent to decay heat. Plausible since this is a required action to be taken when BIIT is reached that affects the energy transfer rate between the RPV and containment.

QUESTIONS REPORT for RO

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

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

QUESTIONS REPORT

for RO

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 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 initiated 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 initiated 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 initiated 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 initiated 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.

QUESTIONS REPORT
for RO

Get licensee to verify Unit 1 Curve 8 value for 300 deg. vs 225 deg.

A. Incorrect because the drywell sprays are initiated based on bulk average drywell temperature. Plausible if applicant thinks that the most conservative temperature should be used, i.e., the highest temperature.

B. Incorrect because the drywell sprays are initiated based on bulk average drywell temperature and the DWSIL curve 8 must be re-assessed each time sprays are initiated. Plausible if applicant thinks that the most conservative temperature should be used, i.e., the highest temperature. OR if the applicant does not know the rules for Curve 8 usage.

C. Correct.

D. Incorrect because the drywell sprays are initiated based on bulk average drywell temperature (vs containment temperature.) and because the DWSIL curve 8 must be re-assessed each time sprays are initiated. Plausible if the applicant thinks that once curve 8 is assessed it is no longer required.

Provide Curve 8 (unit 2) 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

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

QUESTIONS REPORT

for RO

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
- D. HPCI

A. Incorrect because torus level is $< +57.5$ " (IAW CP-1). 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 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

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

QUESTIONS REPORT

for RO

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 encribed 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

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

QUESTIONS REPORT

for RO

61. 295037EA1.07 018/1/1/RMCS/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Unit 2 was operating at 100% power when a scram signal occurred; however, many control rods remained withdrawn after the mode switch was placed in the shutdown position. The following plant conditions currently exist:

Rx pressure 1000 psig
APRM power 40%
Turbine generator on-line at 280 MW(e)
RPV level 36"
Mode Switch in SHUTDOWN

Assuming that only the actions of RC-1 have been taken by the crew, which ONE of the following choices describes whether a control rod(s) can be selected (i.e., latched), and, if so, can the rod be inserted?

- A. NONE of the rods can be selected.
- B. Any rod can be selected.
NONE of the rods can be inserted.
- C. Any rod can be selected.
Rods can NOT be inserted using the RONOR insert position.
Any rod can be inserted using the Emergency-In position.
- D Any rod can be selected.
Any rod can be inserted using the RONOR insert position.
Any rod can be inserted using the Emergency-In position.

A. Incorrect because there are only three items which can prevent rod selection: 1) timer malfunction, 2) RPIS inoperable, and 3) RWM complete loss of power. Plausible if applicant thinks that RWM is causing a select error which causes a select block.

B. Incorrect because the RWM is still above the low power alarm setpoint. Plausible if applicant knows that RWM has not yet been bypassed and the mode switch is still in shutdown.

C. Incorrect because the RONOR insert position will still work since RWM is not enforcing blocks. Plausible if applicant thinks that RWM prevents insertion and thinks that Emergency in will override RWM.

D. Correct. The mode switch in shutdown is causing a rod-out block; however, this does not prevent rod selections and insertion. The RWM is above the enforcing power level.

QUESTIONS REPORT for RO

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?

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

QUESTIONS REPORT

for RO

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

A. Correct. 100 M is stack level release data (i.e., elevated).

0° = 360° = North;

90° = East;

180° = 540° = South

270° = West

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

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

QUESTIONS REPORT

for RO

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: Four valves auto-open at 90 psig and one valve auto-opens at 80 psig
- D. Five motor operated valves: 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)

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

QUESTIONS REPORT

for RO

64. 400000K3.01 001/2/1/RBCCW/NEW/FUND/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.
Drywell temperature will rise.
- B. Recirc MG set oil temperatures will rise.
Drywell temperature will remain the same.
- C. Recirc MG set oil temperatures will remain the same.
Drywell temperature will rise.
- D. Recirc MG set oil temperatures will remain the same.
Drywell temperature will remain the same.

A. Incorrect because the RBCCW pumps are unaffected; i.e., MG set oil temperatures will remain the same. Also incorrect because drywell temperature is controlled by plant service water and normally one fan on each cooling unit is in RUN and the other in AUTO (standby). Plausible if applicant thinks that one of the RBCCW pumps tripped. Also plausible if applicant does not know that the standby cooler fan will autostart.

B. Incorrect because the RBCCW pumps are unaffected; i.e., MG set oil temperatures will remain the same. Plausible if applicant thinks that one of the RBCCW pumps has lost its power supply.

C. Incorrect because drywell temperature is controlled by plant service water and normally one fan on each cooling unit is in RUN and the other in AUTO (standby). Plausible if applicant does not know that the standby cooler fan will autostart or does not know the normal alignment.

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

Tier: 2

Group: 1

Keyword: RBCCW

Source: NEW

Cog Level: FUND

Exam: HT2007-301

Test: RO

Author/Reviewer: BLC/RFA

QUESTIONS REPORT

for RO

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 CRT 1Z43-R404CX IBM Computer and CRT:

1T43087D02 E Torus Wtr Curtain New 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 AOP-N.01, Plant Fires?

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*

QUESTIONS REPORT for RO

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

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

QUESTIONS REPORT

for RO

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

Tier: 3

Group: I

Keyword: CONDUCT OPS

Source: NEW

Cog Level: FUND

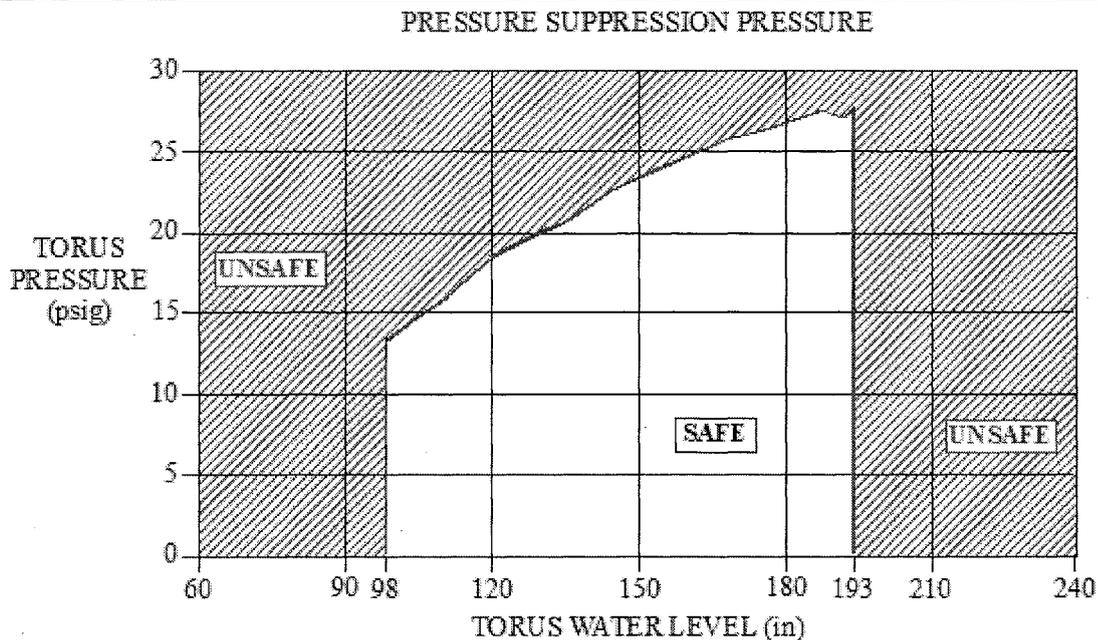
Exam: HT2007-301

Test: RO

Author/Reviewer:

QUESTIONS REPORT
for RO

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

QUESTIONS REPORT
for RO

Tier: 3
Keyword: GRAPH
Cog Level: FUND
Test: RO

Group: 1
Source: NEW
Exam: HT2007-301
Author/Reviewer: BLC/RFA

QUESTIONS REPORT
for RO

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. A power supply for welding machine which is ran from a local electrical panel.
- C. A hose is routed from a plant service air connection to a sandpiper pump.
- D. A hose is 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

QUESTIONS REPORT
for RO

Tier: 3
Keyword: TEMP MOD
Cog Level: FUND
Test: RO

Group: 2
Source: NEW
Exam: HT2007-301
Author/Reviewer: BLC/RFA

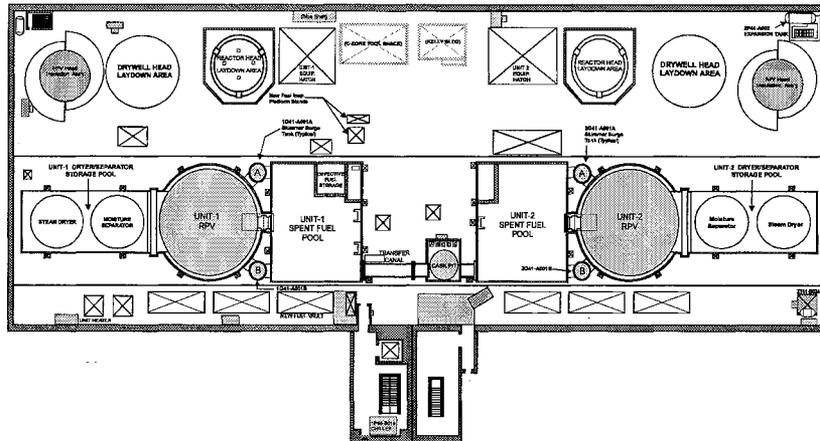
QUESTIONS REPORT for RO

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."

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, Section 4.3.5

Tier:	3	Group:	2
Keyword:	REFUELING	Source:	BANK-MODIFIED
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

QUESTIONS REPORT

for RO

70. G2.2.4 001/3/2/RSDP/NEW/FUND/HT2007-301/RO/BLC/RFA

Which ONE of the following describes the "B" RHR heat exchanger remote shutdown panel (RSDP) emergency transfer switch availability and operation?

- A. With the emergency transfer switch in the NORM position, the **Unit 2** RHR Hx Inlet Vlv (2-E11-F047B) can be operated from EITHER the MCR OR the RSDP.
- B. The emergency transfer switch for the **Unit 1** RHR Hx Bypass Vlv (1-E11-F048B) is located at the 1H21-P173 RSDP on the 130' elevation.
- C. **Unit 1** does not have an emergency transfer switch for the RHR Hx Inlet Vlv (1-E11-F047B) at any of the reactor building RSDPs.
- D. **Unit 2** does not have an emergency transfer switch for the RHR Hx Inlet Vlv (2-E11-F047B) at either of the reactor building RSDPs.

A. Incorrect because this feature does not exist on Unit 2 (only Unit 1). Plausible because this feature exists on Unit 1.

B. Incorrect because this switch is located at panel 1C82-P002, located on the 158' elevation. Plausible because this switch is located at the main RSDP in Unit 2

C. Correct.

D. Incorrect because this switch is located at the main RSDP in Unit 2 (2C82-P001). Plausible because this switch does not exist on Unit 1.

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

31RS-OPS-001-1/2, Attachment 6, Torus Cooling from the Remote Shutdown Panel

Tier:	3	Group:	2
Keyword:	RSDP	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

QUESTIONS REPORT

for RO

71. G2.3.10 001/3/3/RAD CTL/NEW/HIGHER/HT2007-301/RO/BLC/RFA

Unit 1 was initially operating at reduced power with one control rod inserted due to a leaking fuel bundle in accordance with 40AC-ENG-014-0, Failed Fuel, Action Level 1. 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, i.e., do not start the mechanical vacuum pumps.

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.

QUESTIONS REPORT
for RO

A. Correct.

B. Incorrect because 34AB-B21-001-1, Step 4.15 requires CB HVAC in pressurization mode. Plausible if applicant does not know the procedure requirements and question does not state that any initiating conditions have occurred.

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..

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

Tier:	3	Group:	3
Keyword:	RAD CTL	Source:	NEW
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

QUESTIONS REPORT

for RO

72. G2.3.2 001/3/3/ALARA/BANK MOD/HIGHER/HT2007-301/RO/BLC/RFA

An new employee at Plant Hatch told the Radcon personnel that he has an estimated dose of 1.5 rem Total Effective Dose Equivalent (TEDE) exposure for this year. The Radcon 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 administrative 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 administrative 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

Tier:	3	Group:	3
Keyword:	ALARA	Source:	BANK MOD
Cog Level:	HIGHER	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

QUESTIONS REPORT

for RO

73. G2.4.29 001/3/4/E-PLAN/NEW/FUND/HT2007-301/RO/

An event has occurred and the recognition category designator has been determined to be "**E-HU1**."

Based on this designation, which ONE of the following does this event pertain to in accordance with 73EP-EIP-001-0, Emergency Classification and Initial Actions?

- A✓ Damage to a loaded dry cask confinement boundary
- B. Partial loss of AC/DC power
- C. Degradation or loss of one fission product barrier
- D. Unplanned release of liquid effluent

Note: This is a new E-plan at Hatch that will be implemented late Fall '07.

A. Correct.

B. Incorrect because the designator begins with **S** for system related events. Plausible if applicant does not know recognition category designators.

C. Incorrect because the designator begins with **F** for fission product barrier events. Plausible if applicant does not know recognition category designators.

D. Incorrect because the designator begins with **R** for radiological release events. Plausible if applicant does not know recognition category designators.

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)

Tier:	3	Group:	4
Keyword:	E-PLAN	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	

QUESTIONS REPORT

for RO

74. G2.4.45 001/3/4/ANNUNCIATOR/NEW/FUND/HT2007-301/RO/BLC/RFA

Which ONE of the following describes the significance of an annunciator that has a white plastic frame?

- A. Signifies that the alarm is the result of some plant evolution that is both known and expected by the operating crew, i.e., expected alarm flag
- B. Signifies that the annunciator has been disabled, i.e., "pulled"
- C. Signifies that the annunciator corresponds to 31EO-EOP-014-1, Secondary Containment Control flowchart.
- D. Signifies that the annunciator is a "potential" indicator of a radiological condition.

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

Tier:	3	Group:	4
Keyword:	ANNUNCIATOR	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA

QUESTIONS REPORT

for RO

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)
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)
Maintains the level instruments with reference legs inside containment operable.
- C. Drywell temperature increasing due to the inability to spray the drywell. (still < 340)
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)
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, resulting 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, resulting 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

Tier:	3	Group:	4
Keyword:	EOP	Source:	NEW
Cog Level:	FUND	Exam:	HT2007-301
Test:	RO	Author/Reviewer:	BLC/RFA