

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

007 EK2.03 001

Given the following:

- Unit 1 is at 55% power.
- Solid State Protection System (SSPS) Train 'B' Actuation Logic testing is being performed.
- Train 'B' SSPS Mode Selector switch is in the 'TEST' position.
- Train 'B' SSPS Input Error Inhibit switch is in the 'INHIBIT' position.

Which ONE of the following identifies the status of the reactor if a loss of one of the two 48v DC power supplies were to occur on Train 'A' SSPS?

- A. Reactor at 55% power with a General Warning for Train 'A' SSPS only.
- B. Reactor at 55% power with a General Warning for Train 'B' SSPS only.
- C✓ Reactor Trip with a General Warning for both Train 'A' and Train 'B' SSPS and 1-XA-55-4D "Reactor First Out" annunciator panel window(s) LIT.
- D. Reactor Trip with a General Warning for both Train 'A' and Train 'B' SSPS and 1-XA-55-4D "Reactor First Out" annunciator panel windows DARK.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

DISTRACTOR ANALYSIS:

- A. *Incorrect, The reactor will trip due to a General warning on both trains. Plausible since a General Warning is generated for a loss of either 48v DC power supply. If this were the only General Warning the unit would remain at power, but performing testing on the other train generates a General Warning for both trains and the unit trips.*
- B. *Incorrect, The reactor will trip due to a General warning on both trains. Plausible since a General Warning is generated while performing testing on SSPS. If this were the only General Warning the unit would remain at power, but a loss of either 48v DC power supply on the other train generates a General Warning for both trains and the unit trips.*
- C. **CORRECT**, *Testing on one train of SSPS generates a General Warning. A loss of any of the four DC power supplies in the other train of SSPS also generates a General Warning. General Warnings in both trains of SSPS causes the Reactor Trip Breakers to open. Since the power level is above 50%, the turbine trip signal will cause a reactor trip signal to be generated which results in an First Out annunciator and the Negative Rate trips generated from the Nuclear Instruments (NIs) could also be LIT.*
- D. *Incorrect, The reactor will trip but a Reactor First Out annunciator window will be generated. Plausible because there is no First Out annunciator LIT directly due to a general warning trip and if the power level had been lower there would not be a turbine trip signal generated to cause a reactor trip (The First Out annunciator would not alarm if power were less than 50% (P-9)) and with lower power the negative rate trip annunciators may also not be generated.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 1

Tier 1 Group 1

K/A 007 EK2.03  
Reactor Trip  
Knowledge of the interrelations between a reactor trip and the following:  
Reactor trip status panel

Importance Rating: 3.5 / 3.6

Technical Reference: 1-AR-M4-D, Reactor First Out 1-XA-55-4D, Rev.10  
1-AR-M6-A, Reactor Protection and Safeguards,  
1-XA-55-6A, Rev.15  
TI-28 Att.9, Unit 1 & 2 Cycle Data Sheet

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.RPS B.4.m & 5.c  
Describe the following characteristics of each component in the Reactor Protection and Engineered Safety Features Actuation Systems:  
m. Location of controls and indications in the control room and auxiliary control room.  
Describe the operation of the Reactor Protection and Engineered Safety Features Actuation Systems:  
c. Alarms and alarm response.

Question Source:

Bank #   X    
Modified Bank #             
New           

Question History: Question modified from Comanche Peak bank question

Question Cognitive Level:

Memory or fundamental knowledge             
Comprehension or Analysis   X  

10 CFR Part 55 Content: ( 41.7 / 45.7 )

10CFR55.43.b ( n/a )

Comments:

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

009 EK1.02 002

Given the following:

- In response to a small break LOCA, the crew is performing ES-1.2, "Post LOCA Cooldown and Depressurization."
- The next step is to depressurize the RCS to refill the pressurizer.
- Core Exit Temperature is 546 °F and lowering.
- RCS Tavg is 531 °F and lowering.
- RCS wide range pressure is 1520 psig
- RCPs have been removed from service.

Which ONE of the following identifies the current RCS subcooling margin and the operational impact if subcooling is lost (subcooling margin equals 0°F) during the depressurization?

- A. 53°F;  
The RCS cooldown will stop.
- B. 53°F;  
Cause rapid increase in Pressurizer level.
- C. 68°F;  
The RCS cooldown will stop.
- D. 68°F;  
Cause rapid increase in Pressurizer level.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

DISTRACTOR ANALYSIS:

- A. *Incorrect, RCS subcooling is 53°F is correct, but the loss would not prevent the initiated RCS cooldown from the previous step. Plausible because 53°F subcooling is correct and because natural circulation could be affected by steam voids and the presence of head voiding would affect natural circulation cooling but not stop it. In addition, with the sudden pressure drop (RCS pressure ~ 1000 psig) that caused subcooling to go to zero, ECCS flow is going to increase to the point that it will cool the RCS rapidly.*
- B. *CORRECT, with core exit temperature 546°F and saturation for 1520 psig (1535 psia) being 599°F, the RCS subcooling is 53°F. The loss of subcooling could result in upper head voiding causing a rapid increase in pressurizer level as stated in the caution preceding the procedure step.*
- C. *Incorrect, RCS subcooling is not 68°F (it is 53°F) and the loss would not prevent the initiated RCS cooldown from the previous step. Plausible because 68°F could be calculated if the Tav<sub>g</sub> were used instead of Core Exit Thermocouple temperature.  $599^{\circ}\text{F} - 531^{\circ}\text{F} = 68^{\circ}\text{F}$  and because the rapid increase in pressurizer level is correct.*
- D. *Incorrect, RCS subcooling is not 68°F (it is 53°F) Plausible because 68°F could be calculated if the Tav<sub>g</sub> were used instead of Core Exit Thermocouple temperature.  $599^{\circ}\text{F} - 531^{\circ}\text{F} = 68^{\circ}\text{F}$  and because natural circulation could be affected by steam voids and the presence of head voiding would affect natural circulation cooling but not stop it. In addition, with the sudden pressure drop (RCS pressure ~ 1000 psig) that caused subcooling to go to zero, ECCS flow is going to increase to the point that it will cool the RCS rapidly.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 2

Tier 1 Group 1

K/A 009 EK1.02

Knowledge of the operational implications of the following concepts as they apply to the small break LOCA:  
Use of steam tables

Importance Rating: 3.5 / 4.2

Technical Reference: Steam Tables, ALSTOM Power Services  
ES-1.2, Post LOCA Cooldown and Depressurization,  
Rev 17

Proposed references to be provided to applicants during examination:

**Steam Tables**

Learning Objective: OPL271ES-1.2 B.4 & .7  
Describe the bases for all limits, notes, cautions, and step of ES-1.2  
Apply GFE and system response concepts to the performance of ES-1.2 conditions.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #   X   \_\_\_\_\_  
New \_\_\_\_\_

Question History: SQN Bank Question ES-1.2-B.0 002 modified

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis   X   \_\_\_\_\_

10 CFR Part 55 Content: ( 41.8 / 41.10 / 45.3 )

10CFR55.43.b ( n/a )

Comments: SQN Bank Question ES-1.2-B.0 002 modified by adding second part to question, asking for subcooling instead of when subcooling is lost, changing distracters and relocating correct answer.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

011 EK2.02 003

Given the following:

- SI actuated due to a Large Break LOCA.
- BOTH SI Pumps are TRIPPED.
- RCS pressure is 10 psig.
- RCS Subcooling is 0°F.
- Containment pressure is 3.4 psig.
- All other equipment is running per design.
- The crew is performing actions of E-0, "Reactor Trip or Safety Injection."

Which ONE of the following describes the required action and reason for the action with respect to the Reactor Coolant Pumps?

- A. Stop all RCPs to minimize fluid mass loss out of the break.
- B. Stop all RCPs to prevent mechanical damage to the pump and motor.
- C. Leave all RCPs running to provide reflux cooling of the RCS.
- D. Leave all RCPs running to prevent phase separation of RCS liquid.

**DISTRACTOR ANALYSIS:**

- A. Incorrect, RCS mass loss is the concern for a small break, not a large break LOCA. Plausible because the mass loss out the break is the concern during a SBLOCA event.*
- B. Correct, RCPs would be tripped for this reason because Component Cooling Water is isolated and Phase B and Spray is flowing at 3 psig Containment pressure.*
- C. Incorrect, RCP support systems for cooling have been lost due to Phase B isolation, therefore the RCPs would not be left running. Plausible because RCPs would be left running during other accidents.*
- D. Incorrect, RCPs would not be left running during this accident. If they were running during a small break LOCA, phase separation could occur if the RCPs were to trip during the event, leading to core uncover. Plausible because the possible exist to have core uncover if the RCPs were not removed early and did trip during a small break LOCA.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 3

Tier 1 Group 1

K/A 011 EK2.02  
Large Break LOCA  
Knowledge of the interrelations between the and the following Large Break  
LOCA:  
Pumps

Importance Rating: 2.6\* / 2.7\*

Technical Reference: E-0, Reactor Trip or Safety Injection, Rev 30  
Basis Document for E-0 Reactor Trip or Safety  
Injection , Rev 13.

Proposed references to be provided to applicants during examination:  
None

Learning Objective: OPL271E-1 B.6.a  
Given a set of initial plant conditions use E-1 to  
correctly:  
a. Identify required actions.

Question Source:

Bank #   X    
Modified Bank #             
New           

Question History: SQN bank question 011 Ek2.02 001 used on 07 audit  
exam.

Question Cognitive Level:

Memory or fundamental knowledge             
Comprehension or Analysis   X  

10 CFR Part 55 Content: ( 41.7 / 45.7 )

10CFR55.43.b ( n/a )

Comments: Originally WTSI Bank question

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

015 AK2.10 004

Given the following plant conditions:

- Unit 1 operating at 100% power.
- A failure of the Loop 4 RCP #2 seal results in high flow across the #2 seal.

Which ONE of the following identifies how the Loop 4 RCP #2 seal failure would affect the Loop 4 RCP #1 seal leakoff flow indication and the RCP standpipe level alarm?

<u>#1 Seal Leakoff Flow Indication</u>	<u>RCP Standpipe Level Alarm</u>
A. Increases	Alarm due to LOW level
B. Increases	Alarm due to HIGH level
C. Decreases	Alarm due to LOW level
D✓ Decreases	Alarm due to HIGH level

DISTRACTOR ANALYSIS:

- A. *Incorrect, #1 seal leakoff flow indication would decrease (not increase.) and the alarm of the standpipe is due to high level (not low level.) Plausible because the #1 seal leakoff flow indication would increase if the #1 seal had failed and the standpipe level being low would be correct if the #3 seal had failed instead of the #2 seal.*
- B. *Incorrect, #1 seal leakoff flow indication would decrease (not increase.) and the standpipe alarm being due to high level is correct. Plausible because the #1 seal leakoff flow indication would increase if the #1 seal had failed and the standpipe level being high is correct.*
- C. *Incorrect, #1 seal leakoff flow indication decreasing is correct but the alarm of the standpipe is due to high level, not low level. Plausible because the #1 seal leakoff flow indication decreasing is correct and the standpipe level being low would be correct if the #3 seal had failed instead of the #2 seal.*
- D. **CORRECT**, as identified in the 1-AR-M5-B annunciator response window A-2, Note 2: "A High RCP standpipe level in conjunction with reduced No. 1 Seal Leakoff flow and increasing flow to the RCDT is indicative of a failed No.2 seal."

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 4

Tier 1 Group 1

K/A 015 AK2.10

Reactor Coolant Pump (RCP) Malfunctions

Knowledge of the interrelations between the Reactor Coolant Pump Malfunctions  
(Loss of RC Flow) and the following:

RCP indicators and controls

Importance Rating: 2.8\* / 2.8

Technical Reference: 1-AR-M5-B, CVCS Seal Water and RCP 1-XA-55-5B,  
Rev 36  
AOP-R.04 Reactor Coolant Pump Malfunctions,  
Rev 24

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.RCP B.5.d

Describe the operation of the RCP system as it relates  
to the following:

d. How a component failure will affect system operation.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New   X  

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_

Comprehension or Analysis   X  

10 CFR Part 55 Content: ( 41.7 / 45.7 )

10CFR55.43.b ( n/a )

Comments: New question

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

022 AG 2.1.31 005

Given the following:

- Unit 2 at 100% RTP.
- CCP 2A-A trips due to an electrical relay operation.
- Pressurizer level 59% and trending down.

When the OATC is determining status of the plant following the CCP trip, which ONE of the following identifies the expected position of the listed CVCS letdown valves?

2-LCV-69 and -70  
Letdown Isolation Valves

2-LVC-62-72, -73 and -74  
Letdown Orifice Isolation Valves

- |    |        |        |
|----|--------|--------|
| A✓ | OPEN   | CLOSED |
| B. | OPEN   | OPEN   |
| C. | CLOSED | CLOSED |
| D. | CLOSED | OPEN   |

**DISTRACTOR ANALYSIS:**

- A. *CORRECT, The letdown isolation valves (2-FVC-62-69 and -70) will remain open but if the only running charging pump trips, the letdown orifice isolation valves (2-FCV-62-72, -73, and -74) will automatically close.*
- B. *Incorrect, The letdown isolation valves (2-FVC-62-69 and -70) will remain open but the letdown orifice isolation valves (2-FCV-62-72, -73, and -74) will be closed. Plausible because letdown is isolated by the trip of the charging pump and there are interlocks between the letdown isolation valves and the letdown orifice isolation valves.*
- C. *Incorrect, The letdown isolation valves (2-FVC-62-69 and -70) will not close but the letdown orifice isolation valves (2-FCV-62-72, -73, and -74) will close. Plausible because letdown is isolated by the trip of the charging pump and there are interlocks between the letdown isolation valves and the letdown orifice isolation valves.*
- D. *Incorrect, The letdown isolation valves (2-FVC-62-69 and -70) will not close nor will the letdown orifice isolation valves (2-FCV-62-72, -73, and -74) remain open. Plausible because letdown is isolated by the trip of the charging pump and there are interlocks between the letdown isolation valves and the letdown orifice isolation valves.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 5

Tier 1 Group 1

K/A 022 AG 2.1.31

Loss of Reactor Coolant Makeup

Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup.

Importance Rating: 4.6 / 4.3

Technical Reference: AOP-M.09, Loss of Charging, Rev 1  
2-47W611-62-1 R4

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200T.CVCS B.5.d

Describe the operation of the CVCS system:

d. How a component failure will affect system operation

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #   X   \_\_\_\_\_  
New \_\_\_\_\_

Question History: SQN bank question CVCS 011 modified

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_

Comprehension or Analysis   X   \_\_\_\_\_

10 CFR Part 55 Content: ( 41.10 / 45.12 )

10CFR55.43.b ( n/a )

Comments: SQN bank question CVCS 011 modified

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

026 AA2.02 006

Given the following:

- Both Units in service at 100% RTP with all equipment in a normal alignment.

Which ONE of the following would result in a loss of Component Cooling Water (CCS) to an ESF component on Unit 1?

- A. Loss of Train A Essential air.
- B. Loss of Train B Essential air.
- C. Loss of 6.9kV Shutdown Board 1B-B.
- D. Loss of 6.9kV Shutdown Board 2B-B.

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, Loss of Train A Essential header would not cause a loss of CCS flow to any ESF equipment. Plausible because there are valves in the CCS system that fail closed on loss of air. One is the excess letdown heat exchanger that could be mistaken as ESF equipment. Also, because the RHR Heat Exchangers (ESF components) do have air operated valves on the RHR side outlet that would fail open on loss of air and their failure could be mistaken for the CCS side outlet valve.*
- B. *Incorrect, Loss of Train B Essential header would not cause a loss of CCS flow to any ESF equipment. Plausible because there are valves in the CCS system that fail closed on loss of air. One is the excess letdown heat exchanger that could be mistaken as ESF equipment. Also, because the RHR Heat Exchangers (ESF components) do have air operated valves on the RHR side outlet that would fail open on loss of air and their failure could be mistaken for the CCS side outlet valve.*
- C. *Incorrect, Loss of the Unit 1 Train B 6.9kv Unit Board would not cause a loss of CCS flow to any ESF equipment. Plausible because the 1B-B CCS pump would lose power. This pump is normally aligned to the Train A headers and is not running or if running CCS pump 1A-A would be in A-P auto to start as the pressure on pump 1B-B dropped to 40 psig. Plausible because the 1B-B pump would lose power.*
- D. **CORRECT**, *the loss of the Unit 2 Train B 6.9kv Unit Board would result in the loss of the C-S CCS pump which is the pump normally aligned to supply the Unit 1 Train B ESF equipment header and there is no pump aligned for backup.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 6

Tier 1 Group 1

K/A 026 AA2.02

Loss of Component Cooling Water (CCW)

Ability to determine and interpret the following as they apply to  
the Loss of Component Cooling Water:

The cause of possible CCW loss

Importance Rating: 2.9 / 3.6

Technical Reference: AOP-M.03, Loss of Component Cooling Water, Rev 12  
AOP-M.02, Loss of Control Air, Rev 14  
0-SO-70-1, Component Cooling Water System Train  
B, Attachment 1, Dated 05/02/06

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.CCS B.5.d

Describe the operation of the Component Cooling  
Water system:

d. How a component failure will affect system  
operation.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New  \_\_\_\_\_

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis  \_\_\_\_\_

10 CFR Part 55 Content: ( 43.5 / 45.13 )

10CFR55.43.b ( n/a )

Comments: New question

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

029 EG2.2.22 007

To ensure safety limits will not be exceeded during an ATWS event, which ONE of the following identifies the time requirements (in seconds) for tripping the turbine and starting AFW flow?

	<u>Turbine tripped within...</u>	<u>AFW flow within...</u>
A.	30	30
B✓	30	60
C.	60	30
D.	60	60

DISTRACTOR ANALYSIS:

- A. *Incorrect, Per the FR-S.1 and WOG ERG Rev. 2 documents, the main turbine must be tripped within 30 seconds and AFW flow must be established within 60 seconds to prevent exceeding safety limits during the worst case ATWS event (loss of all normal feedwater ATWS). The first distractor is plausible as it is the correct number. The second part of the distractor is plausible as it is the value of the turbine trip time requirement.*
- B. **CORRECT**, *Per the FR-S.1 and WOG ERG Rev. 2 documents, the main turbine must be tripped within 30 seconds and AFW flow must be established within 60 seconds to prevent exceeding safety limits during the worst case ATWS event (loss of all normal feedwater ATWS).*
- C. *Incorrect, Per the FR-S.1 and WOG ERG Rev. 2 documents, the main turbine must be tripped within 30 seconds and AFW flow must be established within 60 seconds to prevent exceeding safety limits during the worst case ATWS event (loss of all normal feedwater ATWS). The first part of the distractor is plausible as it is the value of the AFW flow establishment time requirement. The second part of the distractor is plausible as it is the value of the turbine trip time requirement.*
- D. *Incorrect, Per the FR-S.1 and WOG ERG Rev. 2 documents, the main turbine must be tripped within 30 seconds and AFW flow must be established within 60 seconds to prevent exceeding safety limits during the worst case ATWS event (loss of all normal feedwater ATWS). The first part of the distractor is plausible as it is the value of the AFW flow establishment time requirement. The second part of the distractor is plausible as it is the correct value for the AFW flow establishment.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 7

Tier 1 Group 1

K/A 029 EG2.2.22  
Anticipated Transient Without Scram (ATWS)  
Equipment Control  
Knowledge of limiting conditions for operations and safety limits

Importance Rating: 4.0 / 4.7

Technical Reference: EPM - FR-S.1, Basis document for FR-S.1, Nuclear  
Power Generation ATWS, Rev. 9  
WOG ERG Rev.2 FR-S.1 Background

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271FR-S.1 B.4  
Describe the bases for all limits, notes, cautions and  
steps of FR-S.1

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New  \_\_\_\_\_

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge  \_\_\_\_\_  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: (41.5 / 43.2 / 45.2 )

10CFR55.43.b ( n/a )

Comments: New question

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

038 EA1.13 008

Given the following:

- A Steam Generator Tube Rupture occurs on Unit 1 in #2 Steam Generator (S/G).
- Operating crew is ready to perform the rapid cool down in E-3, "Steam Generator Tube Rupture."
- Tavg is currently 544°F.
- Target Incore temperature is determined to be 480°F.
- The MSIVs are closed.
- All 4 SG pressures are 975 - 980 psig.

After the cooldown is started, which ONE of the following identifies the Loop(s) that would indicate steam flow?

- A. Loop #2 only
- B✓** Loops #1, #3, & #4 only
- C. None of loops
- D. All 4 Loops

**DISTRACTOR ANALYSIS:**

- A. Incorrect, Only the intact loops would be used for cooldown, the ruptured steam generator would be isolated. The cooldown would be conducted via the SG Atmospheric Relief valves on only Loop #1, #2, and #3. Plausible if the applicant determines the cooldown to be needed via SG#2 or if the question stem had identified the ruptured SG pressure was greater than the ARV setpoint.*
- B. CORRECT, only the intact loops would be used for cooldown, the ruptured steam generator would be isolated. The cooldown would be conducted via the SG Atmospheric Relief valves on only Loop #1, #2, and #3; Thus only these 3 would indicate steam flow after the cooldown was started.*
- C. Incorrect, Steam flow would be indicated on Loop #1, #2, and #3 after the cooldown was started. Plausible if the applicant determines that since the MSIVs were closed that flow through the ADV would not be indicated.*
- D. Incorrect, All 4 loops would not indicate steam flow; only Loop #1, #2, and #3 would indicate steam flow after the cooldown was started. Plausible that all 4 would if the stem had identified the ruptured SG pressure was greater than the ARV setpoint or if the applicant does not understand that the ruptured SG is not steamed to maintain level for thermal stratification.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 8

Tier 1 Group 1

K/A 038 EA1.13

Steam Generator Tube Rupture (SGTR)

Ability to operate and monitor the following as they apply to a SGTR:  
Steam flow indicators

Importance Rating: 3.7\* / 3.6

Technical Reference: E-3, Steam Generator Tube Rupture, Rev 17

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271E-3 B.3

Summarize the mitigating strategy for the failure that initiated entry into E-3.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New  \_\_\_\_\_

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge   
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 / 45.5 / 45.6 )

10CFR55.43.b ( n/a )

Comments: New question

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

040 AA1.09 009

Given the following:

- Unit 1 was operating at 100% RTP when an inadvertent automatic signal caused all 4 MSIV's to close.
- The highest Steam Generator outlet steam pressure increased to 1051 psig when a safety valve opened.
- After opening, the safety valve stuck open.
- The operator tripped the reactor and initiated a safety injection.
- The OAC determined Tavg is 537°F and dropping.
- All SG levels are between 2% and 7% on Narrow Range.

Which ONE of the following describes...

- (1) the opening of the safety valve  
and
  - (2) the requirements for AFW flow during performance of E-0, "Reactor Trip or Safety Injection" with the current conditions.
- A. (1) The safety valve opened below its nominal lift setpoint.  
(2) AFW flow CANNOT be reduced.
- B✓ (1) The safety valve opened below its nominal lift setpoint.  
(2) AFW flow will be reduced to between 440 - 600 gpm.
- C. (1) The steam pressure exceeded the safety valve nominal lift setpoint.  
(2) AFW flow CANNOT be reduced.
- D. (1) The steam pressure exceeded the safety valve nominal lift setpoint.  
(2) AFW flow will be reduced to between 440 - 600 gpm.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

DISTRACTOR ANALYSIS:

- A. *Incorrect, The safety valve opened below its minimum lift setpoint and the AFW is directed to be reduced as long as the flow remains above the 440 gpm minimum required for heat sink. Plausible because the safety valve lifting below its nominal setpoint is correct and the applicant may not recall the E-0 step that reduces the AFW flow even with the SG levels less than the minimum for required heat sink and conclude that AFW flow cannot be reduced while in E-0.*
- B. *CORRECT, The safety valves has opened below its nominal setpoint. The safety valve with the lowest setting is has a nominal setpoint of 1064 psig, so if the valve lifted at 1051 psig it opened early. With the cooldown ongoing, E-0 provides action to reduce AFW flow to less than 600 gpm but within steam generator levels less than 10% (min. heat sink) the AFW flow cannot be reduced to less than 440 gpm (min. heat sink)*
- C. *Incorrect, Steam pressure did not exceed the safety valve nominal lift setpoint. (Lowest at 1064 psig) and the AFW is directed to be reduced as long as the flow remains above the 440 gpm minimum required for heat sink. Plausible because the pressure is high and the safety valve minimum lift setpoint can be confused with the Atmospheric Relief valve trip open setpoint of 1040 psig and the applicant may not recall the E-0 step that reduces the AFW flow even with the SG levels less than the minimum for required heat sink and conclude that AFW flow cannot be reduced while in E-0.*
- D. *Incorrect, Steam pressure did not exceed the safety valve nominal lift setpoint. (Lowest at 1064 psig) and E-0 directs the AFW flow to less than 600 gpm but within steam generator levels less than 10% (min. heat sink) the AFW flow cannot be reduced to less than 440 gpm (min. heat sink). Plausible because the pressure is high and the safety valve minimum lift setpoint can be confused with the Atmospheric Relief valve trip open setpoint of 1040 psig and the AFW flow reduction is correct.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

054 AK1.02 010

The following conditions exist on a Unit 1:

- A reactor trip has occurred due to a loss of MFW.
- FR-H.1, "Loss of Secondary Heat Sink" is in progress.
- The RCS is in a feed-and-bleed condition with RCS temperature stable at 570°F.
- The operators restore a feedwater source and prepare to feed the S/Gs which are dry.
- The US directs the operator to establish feed water flow to only one S/G.

Which ONE of the following describes the reason for feeding only one S/G under these conditions?

- A✓ To ensure that if a S/G failure occurs due to excessive stresses, the failure is isolated to one S/G.
- B. To limit the rate of positive reactivity addition to the core due to the cooling of the reactor coolant system.
- C. To prevent a rapid cooldown of the RCS that could lead to a pressurized thermal shock condition on the reactor vessel.
- D. To establish the minimum S/G level to meet Heat Sink requirements as rapidly as possible to allow termination of bleed and feed.

DISTRACTOR ANALYSIS:

- A. *CORRECT, With a dry SG, the tubes will be subjected to excessive thermal stresses. Hence, tube failure is more likely than if the SG was not dry. Therefore, if a failure does occur, it is limited to the one SG.*
- B. *Incorrect, the addition of feedwater would result in cooling the RCS and positive reactivity being inserted to the core but this is not the reason. Plausible because the addition of positive reactivity does occur due to the feedwater addition and feeding only one S/G would reduce the rate of the reactivity addition.*
- C. *Incorrect, the addition of feedwater would result in the cooling the RCS which could cause PTS conditions but this is not the reason for feeding only one S/G. Plausible because the addition of feedwater could result in a PTS condition.*
- D. *Incorrect, Establishing minimum required heat sink conditions as quickly as possible so that feed and bleed can be terminated is a proper goal but that is not the reason feedwater is established to only one S/G when the S/G are hot and dry.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 10

Tier 1 Group 1

K/A 054 AK1.02

Loss of Main Feedwater (MFW)

Knowledge of the operational implications of the following concepts as they apply to Loss of Main Feedwater (MFW):

Effects of feedwater introduction on dry S/G

Importance Rating: 3.6 / 4.2

Technical Reference: EPM-3-FR-H.1, Basis Document for FR-H.1 Loss of Secondary Heat Sink, Rev 8  
FR-H.1, Loss of Secondary Heat Sink, Rev 17

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271FR-H.1 B.4

Describe the bases for all limits, notes, cautions, and steps of FR-H.1.

Question Source:

Bank   X    
Modified Bank #             
New           

Question History: SQN bank question FR-H.1-B-8 001 with changes described below in comments

Question Cognitive Level:

Memory or fundamental knowledge   X    
Comprehension or Analysis           

10 CFR Part 55 Content: ( 41.8 / 41.10 / 45.3 )

10CFR55.43.b ( n/a )

Comments: SQN bank question FR-H.1-B-8 001with:  
Correct answer relocated,  
distracter locations rotated,  
one distracter replaced,

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

055 EK3.02 011

Which ONE of the following identifies the basis for depressurizing the Intact Steam Generators to less than 160 psig in accordance with ECA-0.0, "Loss of All AC Power?"

- A. To reduce inventory loss through RCP seals.
- B. To minimize reactor vessel upper head voiding.
- C. To initiate injection of the Cold Leg Accumulator.
- D. To promote natural circulation in the RCS loops.

DISTRACTOR ANALYSIS:

- A. *CORRECT, as stated in EPM-3, "Basis document of ECA-0.0 Loss of All AC Power" the operator is directed to dump steam at a maximum rate to reduce RCS temperature and pressure which in turn will reduce the rate of RCS inventory loss through the RCP seals.*
- B. *Incorrect, depressurizing the intact SGs by dumping steam is not to prevent upper head voiding in the vessel. Upper head voiding is an acceptable consequence of the depressurization. Plausible because the upper head voiding issue is discussed in a note prior to the step initiating the depressurization.*
- C. *Incorrect, depressurizing the intact SG by dumping steam will reduce RCS pressure and allow CLA to inject into the RCS but while their injection is advantageous; it is not the basis for the action. Plausible because the CLA injection would provide additional inventory to the RCS.*
- D. *Incorrect, Dumping steam will promote natural circulation but it is not the reason for depressurizing the SGs to less than 160 psig. Plausible because the dumping steam would promote natural circulation in the RCS.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 11

Tier 1 Group 1

K/A 055 EK3.02

Loss of Offsite and Onsite Power (Station Blackout)

Knowledge of the reasons for the following responses as they apply to the Station Blackout:

Actions contained in EOP for loss of offsite and onsite power

Importance Rating: 4.3 / 4.6

Technical Reference: ECA-0.0, Loss of All AC Power, Rev 22  
EPM-3-ECA-0.0, Background Document for ECA-0.0  
Loss of All AC Power, Rev 11

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271ECA-0.0 B.4  
Describe the basis for all limits, notes, cautions, and steps of ECA0-0

Question Source:

Bank #   X    
Modified Bank #             
New           

Question History: SQN bank questions ECS-0.0- B.3.b 003 and 007  
with changes

Question Cognitive Level:

Memory or fundamental knowledge   X    
Comprehension or Analysis           

10 CFR Part 55 Content: ( 41.5 / 41.10 / 45.6 / 45.13 )

10CFR55.43.b ( n/a )

Comments: Reworded stem of question and added current values.  
Used distracters from each of the 2 questions  
Relocated correct answer.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

056 AA1.11 012

Given the following:

- A LOCA occurred on Unit 1.
- RCS pressure has stabilized at 1320 psig.
- The crew responded in accordance with the emergency procedures and has now entered ES-1.2, "Post LOCA Cooldown."
- The RHR pumps have been stopped in accordance with ES-1.2.
- NO other ECCS equipment has been removed from service.

If a Loss of Offsite power were to occur, which ONE of the following identifies the status of the ECCS pumps after the shutdown board load sequencing was complete?

	<u>Centrifugal Charging Pumps</u>	<u>Safety Injection Pumps</u>
A.	Running	Running
B. ✓	Running	OFF
C.	OFF	Running
D.	OFF	OFF

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

DISTRACTOR ANALYSIS:

- A. *Incorrect, the centrifugal charging pump (HPI) would sequence back on but the Safety Injection pumps would not sequence back on. Plausible because the Centrifugal Charging Pumps would be running and the Safety Injection pumps would have started back if the safety injection signal had not been reset.*
- B. *CORRECT, the centrifugal charging pump (HPI) would sequence back on and the Safety Injection pumps would be off. Since the SI is reset (as evidenced by the RHR pumps being off and in A-Auto), the Safety Injection pumps would not sequence back on.*
- C. *Incorrect, the centrifugal charging pump (HPI) would not be off, they would sequence back on and the Safety Injection pumps would not be running. Plausible because the Safety Injection pumps would have started back if the safety injection signal had not been reset and the charging pump could be determined to be not running due the required action to place them in pull-to-lock if offsite power were loss after sump swapover occurred.*
- D. *Incorrect, the centrifugal charging pump (HPI) would not be off, they would sequence back on but the Safety Injection pumps would be off. Plausible because the Safety Injection pumps being off is correct and the charging pump could be determined to be not running due the required action to place them in pull-to-lock if offsite power were loss after sump swapover occurred.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 12

Tier 1 Group 1

K/A 056 AA1.11

Ability to operate and / or monitor the following as they apply to  
the Loss of Offsite Power:  
HPI system.

Importance Rating: 3.7\* / 3.7

Technical Reference: ES-1.2, Post LOCA Cooldown, Rev 17  
AOP-P.01, Loss of Offsite Power, Rev 24

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271AOP-P.01 B.3  
Describe the initial operator response to stabilize the  
plant upon entry into AOP-P.01.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New  \_\_\_\_\_

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis  \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 / 45.5 / 45.6 )

10CFR55.43.b ( n/a )

Comments: new question

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

057 AK3.01 013

Given the following:

- Both Units are operating at 93% power.
- All control systems are aligned normally.

Which ONE of the following identifies...

- (1) the 120V AC Vital Instrument Power Board that can be lost without requiring an immediate manual reactor trip,  
and
- (2) a valid reason for manually tripping the reactor if the stated plant condition occurred following the board loss?

	<u>Board</u>	<u>Reason for manual reactor trip</u>
A✓	1-IV	Pressurizer pressure approaches PORV lift setpoint due to loss of PORV automatic control.
B.	1-IV	Volume Control Tank (VCT) level at 20% and dropping with makeup in progress to prevent CCP suction swapover to RWST.
C.	2-II	Pressurizer pressure approaches PORV lift setpoint due to loss of PORV automatic control.
D.	2-II	Volume Control Tank (VCT) level at 20% and dropping with makeup in progress to prevent CCP suction swapover to RWST.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

DISTRACTOR ANALYSIS:

- A. *CORRECT, In accordance with AOP-P.03 and AOP-P.04, only Unit 1 Vital Instrument Power Board IV can be lost and the first step in the procedure not require a Reactor Trip. The loss of any of the other 3 boards on Unit 1 or any of the 4 boards on Unit 2 require that the reactor to be tripped. AOP-P.03, section 2.4, Loss of board 1-IV does direct a reactor trip in the RNO of Step 1 if pressurizer pressure approaches the PORV setpoint due to the loss of automatic control for one PORV and the potential loss of control of the other PORV depending on pressurizer pressure selector switch position.*
- B. *Incorrect, Board 1-IV is the correct board, but VCT level dropping to 20% with makeup in progress would not result in a condition requiring a reactor trip. If level dropped to 7% an automatic switchover to the RWST would occur and if the charging pump suction could not be restored to the VCT, a reactor trip would be required. Plausible because the correct board is identified and if the VCT level was less than 20% with makeup in progress, then the level will not be able to be maintained, eventually resulting in a swapover to the RWST which is identified in the procedure as requiring the reactor to be tripped but because of the injection of borated water into the RCS with the unit at power.*
- C. *Incorrect, Lost of the 2-II board would require a reactor trip in accordance with AOP-P.04. Tripping the reactor if the pressurizer pressure approached the PORV lift setpoint is plausible because a loss of the 2-II board would result in the loss of automatic of both PORVs and because the pressurizer pressure approaching PORV lift setpoint is an action is AOP-P.03 for the loss of the 1-IV board.*
- D. *Incorrect, Lost of the 2-II board would require a reactor trip in accordance with AOP-P.04. Plausible because a loss of the 2-II board would result in the loss of automatic control of both PORVs and because maintaining the VCT level between 13%-60% is addressed in the AOP with the RNO addressing the tripping of the reactor if swapover to the RWST occurs if level drops to 7%. If the level is less than 20% and dropping with makeup in service than the level is unable to be maintained and the setpoint could eventually be reached requiring the reactor to be tripped because of the injection of borated water into the RCS with the unit at power.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 13

Tier 1 Group 1

K/A 057 AK3.01

Loss of Vital AC Electrical Instrument Bus

Knowledge of the reasons for the following responses as they apply to the Loss of Vital AC Instrument Bus:

Actions contained in EOP for loss of vital ac electrical instrument bus

Importance Rating: 4.1 / 4.4

Technical Reference: AOP-P.03, Loss of Unit 1 Vital Instrument Power Board, Rev 21  
AOP-P.04, Loss of Unit 2 Vital Instrument Power Board, Rev 26

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271AOP-P.03&.04 B.8  
Given a set of initial plant conditions use AOP-P.03 & -P.04 to correctly:  
b. Identify required actions

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #   X    
New \_\_\_\_\_

Question History: SQN bank question AOP-P.03-B.3 002 modified.

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis   X  

10 CFR Part 55 Content: ( 41.5, 41.10 / 45.6 / 45.13 )

10CFR55.43.b ( n/a )

Comments: SQN bank question AOP-P.03-B.3 002 modified.  
Correct answer relocated, changed distracter listed boards from III to II,  
added second part of question to identify conditions requiring a reactor trip,  
and made minor wording changes in the stem.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

058 AK1.01 014

Given the following:

- Both Units at 100% power.
- The following alarm is received in the control room:  
125 V DC VITAL CHARG III FAIL /VITAL BAT III DISCHARGE
- Local inspection determines...
  - 125V Vital Battery Charger III DC Output breaker has tripped and **CANNOT** be reset.
  - 125V Vital DC Battery Board III voltage is 128 volts and dropping.

Which ONE of the following identifies the status of 125V Vital DC Battery Channel III and in accordance with 0-SO-250-1, "125 Volt DC Vital Power System," the battery charger that will be placed in service to the board?

<u>125v DC Channel III status</u>	<u>Charger to be placed in service</u>
A. Currently INOPERABLE	1-S Spare Vital Battery Charger
B. <input checked="" type="checkbox"/> Currently INOPERABLE	2-S Spare Vital Battery Charger
C. OPERABLE until voltage drops to less than 120v.	1-S Spare Vital Battery Charger
D. OPERABLE until voltage drops to less than 120v.	2-S Spare Vital Battery Charger

## QUESTIONS REPORT

for 2009 RO Retake Exam Questions

### DISTRACTOR ANALYSIS:

- A. *Incorrect, the channel is INOPERABLE but the 1-S Spare Vital Battery Charger will not be the one aligned to the board. Plausible because the channel being INOPERABLE is correct and the 1-S Spare Vital Battery Charger would be aligned if the charger for 125v Vital Battery Board I or II were lost.*
- B. *CORRECT, Tech Spec requires that each channel have a full capacity charger. The channel is INOPERABLE because the charger is not connected. 0-SO-250-1 will align the 2-S Spare Vital Battery Charger to the board.*
- C. *Incorrect, the channel is not OPERABLE without a full capacity charger connected and the 1-S Spare Vital Battery Charger will not be the one aligned to the board. Plausible because the board voltage is above the minimum value (125v) required for operability (and if the channel were operable, it would eventually become inoperable when the voltage dropped) and the 1-S Spare Vital Battery Charger would be aligned if the charger for 125v Vital Battery Board I or II were lost.*
- D. *Incorrect, the 2-S Spare Vital Battery Charger is the one that will be aligned to the board but the channel is not OPERABLE without a full capacity charger connected. Plausible because the board voltage is above the minimum value (125v) required for operability (and if the channel were operable, it would eventually become inoperable when the voltage dropped) and the 2-S Spare Vital Battery Charger being aligned is correct.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 14

Tier 1 Group 1

K/A 058 AK1.01

Loss of DC Power

Knowledge of the operational implications of the following concepts as they apply to Loss of DC Power:

Battery charger equipment and instrumentation

Importance Rating: 2.8 / 3.1\*

Technical Reference: 1-AR-M1-C, AC/DC Control Power 1-XA-55-1C,  
Rev 41  
1-SO-250-1, 125V DC Vital Power System, Rev 0043  
Unit 1 Technical Specifications 3.8.2.3, Amendment 37

Proposed references to be provided to applicants during examination: None

**Learning Objective: OPT200.DC B.4.c & B.6.a**

Describe the following characteristics of each major component in the DC Electrical Systems:

c. Support equipment and systems

Describe the administrative controls and limits for the DC Electrical Systems:

a. State Tech specs/TRM LCOs that govern the system

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #   X    
New \_\_\_\_\_

Question History: North Anna Exam Bank question 058 K1.01 modified

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis   X  

10 CFR Part 55 Content: ( 41.8 / 41.10 / 45.3 )

10CFR55.43.b ( n/a )

Comments: Modified from question on North Anna Exam 2008

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

062 AK3.01 015

Which ONE of the following identifies the containment isolation signal that would cause a loss of the ERCW supply to the Containment Lower Compartment Coolers and the reason for the isolation?

<u>Isolation Signal</u>	<u>Reason for isolating</u>
A. Phase A Isolation	To ensure the ERCW is not contributing to the rise in containment pressure.
B. Phase A Isolation	To ensure potential containment release paths are isolated.
C. Phase B Isolation	To ensure the ERCW is not contributing to the rise in containment pressure.
D. Phase B Isolation	To ensure potential containment release paths are isolated.

DISTRACTOR ANALYSIS:

- A. *Incorrect, The Containment Lower Compartment Coolers ERCW flow is isolated by a Phase B containment isolation signal not a Phase A signal and the reason is not to ensure the ERCW is not contributing to the rise in containment pressure. It is to ensure potential release paths from containment are isolated. Plausible because a Phase A isolation signal does isolate other containment cooling penetrations (i.e. Incore Instrument room cooling) and the addition of ERCW into containment would increase the mass inside containment.*
- B. *Incorrect, The Containment Lower Compartment Coolers ERCW flow is isolated by a Phase B containment isolation signal not a Phase A signal and the reason is ensure potential release paths from containment are isolated. Plausible because a Phase A isolation signal does isolate other containment cooling penetrations (i.e. Incore Instrument room cooling) and to ensure potential containment release paths are isolated is correct.*
- C. *Incorrect, The Containment Lower Compartment Coolers ERCW flow is isolated by a Phase B containment isolation signal and the reason is not to ensure the ERCW is not contributing to the rise in containment pressure. It is to ensure potential release paths from containment are isolated. Plausible because the isolation signal is correct and the addition of ERCW into containment would increase the mass inside containment.*
- D. **CORRECT**, *The Containment Lower Compartment Coolers ERCW flow is isolated by a Phase B containment isolation signal and the reason is to ensure potential containment release paths are isolated.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 15

Tier 1 Group 1

K/A 062 AK3.01

Loss of Nuclear Service Water

Knowledge of the reasons for the following responses as they apply to the Loss of Nuclear Service Water:

The conditions that will initiate the automatic opening and closing of the SWS isolation valves to the nuclear service water coolers

Importance Rating: 3.2\* / 3.5\*

Technical Reference: 2-47W611-67-3 R 0

FSAR, 9.0 Auxiliary Systems, 9.2.2, ERCW  
Amendment 20

EPM-3, Basis Document for ES-0.5 Equipment  
Verifications, Rev 1

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.CONTCOOLING B.3 & 4.e &.i

Explain the purpose/function of each major component in the flow path of the containment cooling system

Describe the following items of each major component in the containment cooling system.

e. Component operation

i. Protective Features

Question Source:

Bank # \_\_\_\_\_

Modified Bank # \_\_\_\_\_

New  \_\_\_\_\_

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_

Comprehension or Analysis  \_\_\_\_\_

10 CFR Part 55 Content: ( CFR 41.4, 41.8 / 45.7 )

10CFR55.43.b ( n/a )

Comments: New question

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

065 AA2.05 016

Given the following:

- Unit 1 is at 69% power when control air pressure starts dropping.
- The crew implements AOP-M.02, "Loss of Control Air."
- The Control Air system pressure is stabilized when a leak is identified and isolated.
- The isolation resulted in depressurizing the header supplying air to Unit 1 CVCS valves.

In accordance with AOP-M.02, "Loss of Control Air," when the pressurizer level reached which ONE of the following values would the crew be directed to evaluate the need to initiate a unit shutdown using 0-GO-5, "Normal Power Operations?"

- A. drops to less than 17%
- B. drops to less than 44%
- C. rises to greater than 54%
- D✓ rises to greater than 70%

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

DISTRACTOR ANALYSIS:

- A. *Incorrect, The pressurizer level will be increasing not decreasing and AOP-M.02 directs the crew to evaluate the need to initiate a plant shutdown when the level exceeds 70% (not dropping to 17%). Plausible because the applicant must determine which way the level is going by determining the failure positions of the valves and 17% is the setpoint where letdown isolates, heaters turn off and an annunciator actuates.*
- B. *Incorrect, The pressurizer level will be increasing not decreasing and AOP-M.02 directs the crew to evaluate the need to initiate a plant shutdown when the level exceeds 70% (not dropping to 44%). Plausible because the applicant must determine which way the level is going by determining the failure positions of the valves and 44% is the setpoint where an annunciator actuates due to the level being 5% below the programmed level setpoint at 69% power.*
- C. *Incorrect, The pressurizer level will be increasing but exceeding 70% (not 54%) is the value where AOP-M.03 directs the crew to evaluate the need to initiate a plant shutdown. Plausible because the applicant must determine which way the level is going by determining the failure positions of the valves and 54% is the setpoint where an annunciator actuates and backup heaters energize due to the level being 5% above the programmed level setpoint at 69% power.*
- D. **CORRECT**, *With a loss of air the charging valves fail open and the letdown valves fail closed resulting in an increasing pressurizer level. AOP-M.02 directs the crew to evaluate the need to initiate a plant shutdown if the pressurizer level exceeds 70%.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 16

Tier 1 Group 1

K/A 065 AA2.05

Ability to determine and interpret the following as they apply to the Loss of Instrument Air:

When to commence plant shutdown if instrument air pressure is decreasing

Importance Rating: 3.4 / 4.1

Technical Reference: AOP-M.02, Loss of Control Air, Rev 14  
1,2-47W848-6 R17  
1,2-47W848-7 R25

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271.AOP.M-03 B.7  
Describe the conditions and reason for transitions within this procedure and the transitions to other procedures.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #   X   \_\_\_\_\_  
New \_\_\_\_\_

Question History: SQN Bank question 065 AA2.05 080 modified

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis   X   \_\_\_\_\_

10 CFR Part 55 Content: ( 43.5 / 45.13 )

10CFR55.43.b ( n/a )

Comments: Changed stem and distracters, relocated correct answer.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

077 G 2.2.39 017

Given the following:

- Both units operating at 100% with the switchyard and electrical board feeds in a normal configuration.
- 0-SI-OPS-082-007.W, "AC Electrical Power Source Operability Verification," completed on the previous shift.
- At 0901, a disturbance in the switchyard results in the following:
  - 6.9kV Shutdown Boards 1A-A and 2A-A voltage dropped to 5300v.
  - 6.9kV Shutdown Boards 1B-B and 2B-B voltage dropped to 5700v.
  - All sections of 161kv Bus 2 are de-energized due to a differential relay operation.
- At 0902, operators note the following:
  - All shutdown boards at normal voltage.
  - All switchyard breakers in the normal position except for all 161kV Bus 2 breakers which have tripped.

Which ONE of the following identifies...

- (1) the Diesel Generators that would be running  
and
- (2) the requirement relative to the performance of 0-SI-OPS-082-007.W?

- A. (1) Only the Train A DGs would be running;  
(2) Within 1 hour perform 0-SI-OPS-082-007.W to verify one offsite power supply is operable
- B. (1) Only the Train A DGs would be running;  
(2) Performance of SI-OPS-082-007.W is NOT required since it was performed on the previous shift.
- C✓ (1) All four DGs would be running;  
(2) Within 1 hour perform 0-SI-OPS-082-007.W to verify one offsite power supply is operable.
- D. (1) All four DGs would be running;  
(2) Performance of SI-OPS-082-007.W is NOT required since it was performed on the previous shift.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, All 4 diesel generators would start (not just the Train A DGs) and 0-SI-OPS-082-007.W is required to be performed within 1 hour to comply with T/S 3.8.1.1. Plausible because only Train A (2 DGs) shutdown board voltages dropped to the voltage required to cause load shed and DG start. Also, because the SI being required to be performed is correct.*
- B. *Incorrect, All 4 diesel generators would start (not just the Train A DGs) and 0-SI-OPS-082-007.W would not remain on its normal frequency. (It is required to be performed within 1 hour to comply with T/S 3.8.1.1). Plausible because only Train A (2 DGs) shutdown board voltages dropped to the voltage required to cause load shed and DG start and the weekly SI was run on previous shift, all four shutdown boards have normal voltage and the SI is in its normal frequency.*
- C. **CORRECT**, *Voltage less than 80% (5520v) on any 6.9kv Shutdown Board any will cause all 4 diesel generators to start via the common emergency start relay and T/S 3.8.1.1 is required to be entered due to the loss of a complete 161kv Bus with the Units in Mode 1 through 4. T/S 3.8.1.1 Action A requires the remaining offsite power supply to be demonstrated to be operable within 1 hour. 0-SI-OPS-082-007.W is used to demonstrate the operability.*
- D. *Incorrect, All 4 diesel generators start via the common emergency start relay and 0-SI-OPS-082-007.W is required to be performed to comply with T/S 3.8.1.1. Plausible because all 4 DGs starting is correct and the weekly SI was run on previous shift, all four shutdown boards have normal voltage and the SI is in its normal frequency.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 17

Tier 1 Group 1

K/A 077 G 2.2.39

Generator Voltage and Electrical Grid Disturbances

Knowledge of less than or equal to one hour Technical Specification action statements for systems.

Importance Rating: 3.9 / 4.5

Technical Reference: Unit 1 Technical Specifications 3.8.1.1, Amendment 241  
GOI-6, Apparatus Operations, Rev 130  
TI-28 Att. 9, Unit 1 & 2 Cycle Data Sheet 6/28/07

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.SWYD B.5.d & .6.a

Describe the operation of the switchyard system:

d. How a component failure will affect system operation.

Describe the administrative controls and limits for the system as explained in this lesson.

a. State the  $\leq$  1 hour action limit TS LCOs.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New   X   \_\_\_\_\_

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_

Comprehension or Analysis   X   \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 / 41.10 / 43.2 / 45.13 )

10CFR55.43.b ( n/a )

Comments: New question

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

W/E11 EA2.1 018

Given the following:

- A LOCA has occurred on Unit 1.
- During performance ES-1.3, "Transfer to RHR Containment Sump", the following conditions develop:
  - RHR pump 1B-B trips and cannot be restarted.
  - Train "A" Containment Sump Valve (63-72) cannot be opened.
  - Core Cooling Status Tree indicates an Orange path.
  - RWST level has dropped to 23%.
  - Containment pressure is 5.3 psig.
  - A transition is made to ECA-1.1, "Loss of Containment Recirculation."
  - Due to the containment pressure, FR-Z.1 "High Containment Pressure" is being performed concurrently with ECA-1.1.

Which ONE of the following identifies the...

- (1) the ECCS pumps that would be stopped prior to the transition to ECA-1.1,  
and  
(2) which procedure controls the operation of the containment spray pumps?

ECCS Pumps stopped

Spray Pump operation controlled by...

- |                   |          |
|-------------------|----------|
| A. RHR pumps only | FR-Z.1.  |
| B. RHR pumps only | ECA-1.1. |
| C. All ECCS pumps | FR-Z.1.  |
| D. All ECCS pumps | ECA-1.1. |

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

DISTRACTOR ANALYSIS:

- A. *Incorrect, the RHR pumps will be stopped when the transfer to the containment sump cannot be completed in accordance with ES-1.3 and a transition is to be made to ECA-1.1 but the containment Spray pump operation will not be controlled by FR-Z.1. Plausible because the RHR pumps being stopped is correct and when FR-Z.1 is entered it normally would be the procedure controlling the Containment Spray Pump operation.*
- B. *CORRECT, ES-1.3 will direct stopping the RHR pumps when the transfer to the containment sump cannot be completed in accordance with ES-1.3 and a transition is to be made to ECA-1.1. After the transition to ECA-1.1 and the concurrent performance of FR-Z.1, the Spray pump operation will be controlled by ECA-1.1.*
- C. *Incorrect, All ECCS pumps will not be stopped when the sump swapover cannot be completed , only the RHR pumps will be stopped and the Containment Spray pump operation will not be controlled by FR-Z.1. Plausible because all ECCS pumps would be stopped during performance of ES-1.3 if the RWST level dropped to 8% and when FR-Z.1 is entered it normally would be the procedure controlling the Containment Spray Pump operation.*
- D. *Incorrect, All ECCS pumps will not be stopped when the sump swapover cannot be completed , only the RHR pumps will be stopped and the Containment Spray pump operation will be controlled by ECA-1.1 when FR-Z.1 is entered in parallel with the ECA. Plausible because all ECCS pumps would be stopped during performance of ES-1.3 if the RWST level dropped to 8% and the Containment Spray pump operation being controlled by ECA-1.1 is correct.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 18

Tier 1 Group 1

K/A W/E11 EA2.1

Loss of Emergency Coolant Recirculation

Ability to determine and interpret the following as they apply to  
the (Loss of Emergency Coolant Recirculation)

Facility conditions and selection of appropriate procedures during abnormal  
and emergency operations.

Importance Rating: 3.4 / 4.2

Technical Reference: ES-1.3, Transfer to RHR Containment Sump, Rev. 16  
ECA-1.1, Loss of Containment Sump Recirculation, Rev 11  
FR-Z.1, High Containment Pressure, Rev 18  
EPM-3-FR-Z.1, Bases Document for FR-Z.1 High  
Containment Pressure, Rev 9

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271ECA 1.1 B.2.b  
Discuss the ECA-1.1 entry conditions  
b. Describe the requirements associated with ECA-1.1  
entry conditions.  
OPL271ES 1.3 B.6.a & .b  
Given a set of initial plant conditions use ES-1.3 to  
correctly:  
a. Identify required actions  
b. Respond to contingencies

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New   X  

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis   X  

10 CFR Part 55 Content: ( 43.5 / 45.13 )

10CFR55.43.b ( n/a )

Comments: New question

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

003 AK3.06 019

The following plant conditions exist:

- Unit 1 Reactor is at 70% RTP.
- The OATC notices that control bank D group 2 rod H-8 has dropped into the core.
- The operating crew enters AOP-C.01, "Rod Control System Malfunctions" Section 2.2, "Dropped Rod(s)- Reactor Initially in Mode 1 or 2."
- Prior to withdrawing H-8, the OATC is directed to adjust the group step counter for Control Bank D Group 2 to ZERO steps.

Which ONE of the following describes the reason the group step counter is adjusted to ZERO?

- A. Ensures that rod URGENT FAILURE alarm will not annunciate during rod retrieval.
- B. Restores low insertion limit alarm function associated with M-4B Window A-7 ROD CONTROL BANKS LIMIT LOW.
- C. Restores rod to rod misalignment alarm function associated with M-4B Window D-4 COMPUTER ALARM ROD DEV AND SEQ NIS PWR RANGE TILTS.
- D✓ Allows the operator to determine that rod control system is attempting to withdraw the dropped rod and enables the operator to match individual rod position to bank position.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. *Incorrect. Resetting group step counter to ZERO on Control Bank D will NOT prevent URGENT FAILURE alarm during subsequent rod withdrawal. Plausible because an Urgent Failure is an alarm associated with the rod control system and will alarm is a group receives a demand for movement but no movement is sensed.*
- B. *Incorrect, This alarm will clear when dropped rod is restored to position above RIL. Plausible because the alarm would be in prior to withdrawal and then clear as rod is withdrawn.*
- C. *Incorrect, Rod-to-rod misalignment function is independent of group demand position. Plausible because there is a rod-to-rod alignment check but it is not from the step counter.*
- D. **CORRECT**, *The step counter will count up as the rod is withdrawn and the RPI will indicate the rod is being withdrawn. The rod can be withdrawn until the step counter matches the other step counters.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 19

Tier 1 Group 2

K/A 003 AK3.06

Dropped Control Rod

Knowledge of the reasons for the following responses as they apply to the Dropped Control Rod:

Reset of demand position counter to zero.

Importance Rating: 2.7\* / 3.0\*

Technical Reference: AOP-C.01, Rod Control System Malfunctions,  
Rev 20.

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271AOP-C.01 B.6

Describe the bases for all limits, notes, cautions, and steps of AOP-C.01.

Question Source:

Bank #   X    
Modified Bank #             
New           

Question History: SQN Bank Question AOP-C.01-B.4 041

Question Cognitive Level:

Memory or fundamental knowledge   X    
Comprehension or Analysis           

10 CFR Part 55 Content: ( 41.5,41.10 / 45.6 / 45.13 )

10CFR55.43.b ( n/a )

Comments: Minor wording changes in stem, reordered distracters.  
Relocated correct answer.  
Used on 2004 RO exam.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

032 AK1.01 020

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

The SRM detectors operate in the \_\_\_\_\_ region and if the detector high voltage power supply slowly fails the output counts will \_\_\_\_\_

- A. ionization;  
decrease linearly as voltage drops
- B. ionization;  
remain relatively constant, then decrease
- C. geiger-mueller;  
decrease linearly as voltage drops
- D. geiger-mueller;  
remain relatively constant, then decrease

**DISTRACTOR ANALYSIS:**

- A. Incorrect, the detector operating in the ionization region is correct, but in this region, the output is not affected when the voltage begins to drop and is relatively constant until the recombination region and then decreases on an exponential curve verses a linear. Plausible because the ionization region is the correct region on the curve and the output does decrease eventually in the recombination region.*
- B. CORRECT, The detectors for the SRM and IRM are fission chambers that operate in the ionization region of the "Number of ions collected versus applied voltage" curve and if the voltage slowly drops to zero as the power supply fails, it will remain relatively constant in the ionization region and then decrease to zero in the recombination region.*
- C. Incorrect, The detector operates in the ionization region not the Geiger Mueller region, and the output is not affected when the voltage begins to drop and is relatively constant until the recombination region and then decreases on a exponential curve verses a linear. Plausible because the Geiger Mueller region is an identified region on the curve and the output does decrease eventually in the recombination region.*
- D. Incorrect, The detector operates in the ionization region not the Geiger Mueller region, and the output is not affected when the voltage begins to drop and is relatively constant until the recombination region and then decreases. Plausible because the Geiger Mueller region is an identified region on the curve and the output remaining constant, then decreasing is correct.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 20

Tier 1 Group 2

K/A 032 AK1.01

Loss of Source Range Nuclear Instrumentation

Knowledge of the operational implications of the following concepts as they apply to Loss of Source Range Nuclear Instrumentation:

Effects of voltage changes on performance

Importance Rating: 2.5 / 3.1

Technical Reference: OPT200.NIS, Excore Nuclear Instrumentation System  
(NIS) Rev. 4

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.NIS B.4.e & j & B.5.d

Describe the following characteristics of each major component in the NIS system:

e. Component operation

j. Failure modes

Describe the operation of the NIS system:

d.. How a component failure will affect NIS operation.

i. Protective Features

j. Failure modes

Question Source:

Bank #   X  

Modified Bank #           

New           

Question History: SQN Bank question NIS-B.4 005

Question Cognitive Level:

Memory or fundamental knowledge           

Comprehension or Analysis   X  

10 CFR Part 55 Content: ( 41.8 / 41.10 / 45.3 )

10CFR55.43.b ( n/a )

Comments: SQN Bank question NIS-B.4 005  
Relocated correct answer

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

059 AK2.01 021

Given the following:

- A Steam Generator Tube Leak has resulted in contamination of Condensate Demin Resin.
- A High Crud Tank release is to be made and Chemistry has determined a Batch Release is required because the activity is too high to allow a Continuous Release.

Without operator actions, which ONE of the following identifies the radiation monitor that would detect the radiation level of the release and a condition that could result in accidentally releasing excessive radiation if High Crud Tank activity was higher than expected?

- A. 0-RM-90-212, Turbine Building Sump Rad Monitor, reaches high rad alarm setpoint.
- B. 0-RM-90-225, Condensate Demineralizer Rad Monitor, reaches high rad alarm setpoint.
- C. 0-RM-90-212, Turbine Building Sump Rad Monitor, alarms due to instrument down-scale failure.
- D✓ 0-RM-90-225, Condensate Demineralizer Rad Monitor, alarms due to instrument down-scale failure.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

DISTRACTOR ANALYSIS:

- A. *Incorrect, A Batch Release of a High Crud Tank would not be made through the Turbine Building sump. Plausible because normal releases are made through the Turbine Building sump and if the release was a continuous release via the sump and 0-RM-90-212 would alarm but not cause the termination of the release.*
  
- B. *Incorrect, The High radiation condition would cause the termination of the release by closing 1-FCV-14-288. Plausible because some Hi Rad signals do not cause the isolation of the flow. (example - Turbine Building Sump Radiation Monitor.)*
  
- C. *Incorrect, A Batch Release of a High Crud Tank would not be made through the Turbine Building sump. Plausible because normal releases are made through the Turbine Building sump and if the release was a continuous release via the sump and 0-RM-90-212 failed downscale it would cause an instrument malfunction alarm, but not cause the termination of the release, even though some instrument malfunction alarms do cause an isolation.*
  
- D. **CORRECT**, *A downscale failure of 0-RM-90-225 would cause an instrument malfunction alarm but would not stop the flow path of the release. Thus, the contents of the tank would continue to the cooling tower blowdown and then to the waters of the US.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 21

Tier 1 Group 2

K/A 059 AK2.01

Accidental Liquid Radwaste Release

Knowledge of the interrelations between the Accidental Liquid Radwaste Release and the following:

Radioactive-liquid monitors

Importance Rating: 2.7 / 2.8

Technical Reference: 0-AR-M12-A, Unit 1 and Common Radiation Monitors,  
Rev. 52

0-SO-14-8, Condensate Demineralizer High Crud  
Tank Operation, Rev 0036

Dwg. 1, 2-47W611-14-19 R4

Dwg. 1, 2-47W611-14-21 R2

Dwg. 1, 2-47W611-14-22 R4

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.RM B 5.c.

Describe the operation of the Radiation Monitoring  
System:

c. Alarms and alarm response

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New  \_\_\_\_\_

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_

Comprehension or Analysis  \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 / 45.7 )

10CFR55.43.b ( n/a )

Comments: New question

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

068 AG 2.1.27 022

Given the following;

- The Unit 1 Operating crew implemented AOP-C.04, "Shutdown From Auxiliary Control Room," and established control from the Auxiliary Control Room.

Which ONE of the following identifies the use of Emergency Operating Procedures (EOPs) when evacuating the Main Control Room and the procedural requirements when it is determined that control can be re-established in Main Control Room (MCR)?

Emergency Operating Procedures...

- A. remain applicable when evacuating the MCR and AOP-C.04 does contain the actions required to return to the MCR.
- B. remain applicable when evacuating the MCR and when returning to the MCR a procedure would have to be written because AOP-C.04 does **NOT** contain the required actions.
- C. are **NOT** applicable when evacuating the MCR and AOP-C.04 does contain the actions required to return to the MCR.
- D. are **NOT** applicable when evacuating the MCR and when returning to the MCR a procedure would have to be written because AOP-C.04 does **NOT** contain the required actions.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

DISTRACTOR ANALYSIS:

- A. *Incorrect, EOPs do not remain applicable when evacuating the Main Control Room but AOP-C.04 does contain the required steps to return to the Main Control Room. Plausible because the EOPs normally take precedent over AOPs and AOP-C.04 having a section for returning to the Main Control Room is correct.*
  
- B. *Incorrect, EOPs do not remain applicable when evacuating the Main Control Room but AOP-C.04 does contain the required steps to return to the Main Control Room. Plausible because the EOPs normally take precedent over AOPs and for some major events, recovery procedures must be written by the Technical Support Center to restore the plant to normal conditions and/or configurations.*
  
- C. *CORRECT, A note in AOP-C.04 states that the EOPs are not applicable when evacuating the Main Control Room and the AOP does have a section for returning to the Main control Room when determination is made for the return.*
  
- D. *Incorrect, EOPs are not applicable when evacuating the Main Control Room but AOP-C.04 does contain the required steps to return to the Main Control Room. Plausible because the EOPs not being applicable is correct and for some major events, recovery procedures must be written by the Technical Support Center to restore the plant to normal conditions and/or configurations.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 22

Tier 1 Group 2

K/A 068 AG 2.1.27  
Control Room Evacuation  
Knowledge of system purpose and/or function.

Importance Rating: 3.9 / 4.0

Technical Reference: AOP-C.04, Shutdown From Auxiliary Control Room,  
Rev 17

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271AOP-C.04 B.1  
State the purpose/goal of this AOP-C.04.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #  X  \_\_\_\_\_  
New \_\_\_\_\_

Question History: SQN question 068 AG2.4.7 082 modified

Question Cognitive Level:

Memory or fundamental knowledge  X   
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 )

10CFR55.43.b ( n/a )

Comments: SQN question 068 AG2.4.7 082 modified which was written for  
the 2009 exam but not used and has not been put into any  
bank outside exam room.  
Question modified to the point of being new, but 068 AG2.4.7  
082 was the starting point for writing the question.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

076 AA1.04 023

Given the following:

- Unit 1 at 100% power with a 48 gpd steady state S/G #2 tube leak for the past 9 hours.
- 1-RM-90-119, "Condenser Vacuum Exhaust" and 1-RM-90-106, "Lower Containment" radiation monitor count rates begin to rise concurrently.

In accordance with AOP-R.01, "Steam Generator Tube Leak," which ONE of the following could cause the concurrent increase in the radiation monitors?

- A. The development of a sudden fuel defect.
- B. An RCS leak develops inside containment.
- C. A rapid temperature rise inside containment.
- D. Oscillating primary to secondary leakage (Spiking).

DISTRACTOR ANALYSIS:

- A. *CORRECT, AOP-R.01, Section 2.2 has note prior to Step 2 identifying a lower containment rad monitor count rate rising concurrently with secondary rad monitors may indicate a sudden fuel defect which could give a false indication of S/G tube leakage. AOP-R.06, High RCS activity also has a caution "Simultaneous increases in Condenser Vacuum Exhaust and Lower Containment radiation monitor count rates could indicate a new fuel defect instead of an increase in primary-to-secondary leak rate.*
- B. *Incorrect, An RCS leak developing inside containment would cause the containment rad monitor count rate rising but not the condenser vacuum exhaust secondary rad monitor to rise. Plausible because an RCS leak inside containment would cause the lower containment rad monitor to increase.*
- C. *Incorrect, AOP-R.01 does not discuss a rapid temperature increase inside containment causing the monitors to rise concurrently. Plausible because the effect of a rapid temperature rise inside containment affecting the containment post accident rad monitor readings is discussed in the annunciator response for the containment post accident rad monitors.*
- D. *Incorrect, the oscillating primary-to-secondary leakage "spiking" phenomenon would not cause the monitors to rise concurrently. Plausible because the phenomenon is discussed in AOP-R.02 relative to repetitive rises and drops in the S/G tube leakage rates.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 23

Tier 1 Group 2

K/A 076 AA1.04

High Reactor Coolant Activity

Ability to operate and / or monitor the following as they apply to the High Reactor Coolant Activity:

Failed fuel-monitoring equipment

Importance Rating: 3.2 / 3.4

K/A match: The question requires the applicant to recognize a condition that could exist as a result of failed fuel from information provided during monitoring radiation monitors affected by the fuel failure..

Technical Reference: AOP-R.01, Steam Generator Tube Leakage, Rev 25  
AOP-R.06, High RCS Activity, Rev 10

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271AOP-R.01 B.6

Describe the bases for all limits, notes, cautions, and steps of AOP-R.01

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #  X  \_\_\_\_\_  
New \_\_\_\_\_

Question History: SQN bank question AOP-R.06-B.3 006 modified

Question Cognitive Level:

Memory or fundamental knowledge  X  \_\_\_\_\_  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 / 45.5 / 45.6 )

10CFR55.43.b ( n/a )

Comments: SQN bank question AOP-R.06-B.3 006 modified

Question stem and choices rewritten to ask what would happen to cause concurrent rise in rad monitors versus what a new fuel defect would cause.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

W/E03 EK3.4 024

Given the following:

- In responding to a LOCA on Unit 1, the crew has transitioned to ES-1.2, "Post LOCA Cooldown."
- The crew has terminated ECCS flow and established normal charging
- Currently the RCS That is at 415°F and 1125 psig.
- The crew is preparing to isolate the Cold Leg Accumulators (CLAs).

Which ONE of the following identifies...

- (1) a condition required to be met prior to isolating the CLAs  
and
  - (2) if one of the CLA isolation valves cannot be closed, where will the nitrogen be routed to be released as the CLA is being vented?
- A. (1) RCS subcooling must be reduced to less 50°F;  
(2) inside containment.
- B. (1) RCS subcooling must be reduced to less 50°F;  
(2) to be Waste Gas System.
- C✓ (1) RCS pressure must be reduced to less than 1000 psig;  
(2) inside containment.
- D. (1) RCS pressure must be reduced to less than 1000 psig;  
(2) to the Waste Gas System.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, the RCS subcooling is not required to be reduced before the accumulators are isolated (the subcooling reduction will occur in the step following the CLS isolation) and if one of the CLA must be vented, but the nitrogen will be released inside containment. Plausible because the subcooling reduction to less than 50°F will occur in the step following the CLS isolation and the nitrogen being release inside containment is correct.*
- B. *Incorrect, the RCS subcooling is not required to be reduced before the accumulators are isolated (the subcooling reduction will occur in the step following the CLS isolation) and if one of the CLA must be vented, the nitrogen will be released inside containment (not to the Waste Gas System). Plausible because the subcooling reduction to less than 50°F will occur in the step following the CLS isolation and the Waste Gas System is the place nitrogen pressure in other tanks is routed when the tanks are vented.*
- C. **CORRECT**, *the RCS pressure must be reduced to less than 1000 psig prior to isolating the accumulators. T/S requires CLAs to be operable in Mode 3 with the RCS pressure greater than 1000 psig. If a CLA is required to be vented, the nitrogen is released inside containment*
- D. *Incorrect, the RCS pressure must be reduced to less than 1000 psig before the accumulators are isolated and if one of the CLA must be vented, the nitrogen will be released inside containment (not to the Waste Gas System). Plausible because reducing RCS pressure to less than 1000 psig is correct and the Waste Gas System is the place nitrogen pressure in other tanks is routed when the tanks are vented.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 24

Tier 1 Group 2

K/A W/E03 EK3.4

LOCA Cooldown and Depressurization

Knowledge of the reasons for the following responses as they apply to the (LOCA Cooldown and Depressurization)

RO or SRO function within the control room team as appropriate to the assigned position, in such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated.

Importance Rating: 3.5 / 3.9

Technical Reference: Technical specifications 3.5.1, Amendment 322  
ES-1.2, Post LOCA Cooldown and Depressurization,  
Rev. 17  
EA-63-1, Venting Unisolated Cold Leg Accumulators,  
Rev. 0  
1, 2-47W830-6 R51

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271.ES-1.2 B.4  
Describe the base for all limits, notes, cautions, and steps of ES-1.2

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #   X   \_\_\_\_\_  
New \_\_\_\_\_

Question History: SQN bank question ES-1.2 005 modified.

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis   X   \_\_\_\_\_

10 CFR Part 55 Content: ( 41.5 / 41.10, 45.6 / 45.13 )

10CFR55.43.b ( n/a )

Comments: SQN bank question ES-1.2 005 modified.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

W/E07 EA2.1 025

Given the following:

- A LOCA is in progress on Unit 2.
- Crew currently performing E-1, "Loss of Reactor or Secondary Coolant."
- Due to power and equipment failures the only ECCS pumps running are the RHR pumps.
- Containment Pressure in 4.6 psig.
- RCS Pressure is 805 psig.
- Core Exit TC's are 521°F.
- RCS subcooling is 0°F.
- RVLIS indicates 43%.

Which ONE of the following identifies which range of RVLIS is used for the current conditions and the procedure directed by the Core Cooling Critical Safety Function Status Tree?

**Reference Provided**

<u>RVLIS Range being used</u>	<u>Procedure direction provided by Core Cooling Status Tree</u>
A. Lower Range	Go To FR-C.2
B. Lower Range	Go To FR-C.3
C. Dynamic Range	Go To FR-C.2
D. Dynamic Range	Go To FR-C.3

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

DISTRACTOR ANALYSIS:

- A. *Incorrect, The RVLIS Lower Range being used is correct but the status tree does not indicate an orange path to FR-C.2. Plausible because the Lower Range is correct and because the RVLIS value is less than the minimum of 44% if the Table 2 values were used as the minimum, then the status tree would indicate an orange path to FR-C.2*
- B. *CORRECT, With containment pressure above Phase B setpoint (2.81 psig), the RCPs trip criteria would be met resulting in the Lower Range of RVLIS being used and with the RVLIS indication greater than 42%, the Status tree indicates a yellow path to FR-C.3.*
- C. *Incorrect, The RVLIS Dynamic Range being used is not correct because the RCPs would not be running and the status tree does not indicate an orange path to FR-C.2. Plausible because with no CCP or SI pumps running the RCPs would not have been stopped due to RCS pressure being below 1250 psig and if the candidates does not recognize the Phase B RCP trip criteria and determines the RCPS are running, the Dynamic Range would be used. With RCPs running, the RVLIS value is less than the Table 2 minimum value of 44%, then the status tree would indicate an orange path to FR-C.2*
- D. *Incorrect, The RVLIS Dynamic Range being used is not correct because the RCPs would not be running but the status tree does indicate an orange path to FR-C.3. Plausible because with no CCP or SI pumps running the RCPs would not have been stopped due to RCS pressure being below 1250 psig and if the candidates does not recognize the Phase B RCP trip criteria and determines the RCPS are running, the Dynamic Range would be used. If any value in Table 2 other than "ALL RCPs RUNNING" is used then, the status tree would indicate an yellow path to FR-C.3*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 25

Tier 1 Group 2

K/A W/E07 EA2.1

Saturated Core Cooling:

Ability to determine and interpret the following as they apply to the  
(Saturated Core Cooling):

Facility conditions and selection of appropriate procedures during  
abnormal and emergency operations.

Importance Rating: 3.2 / 4.0

Technical Reference: 2-FR-0, Unit 2 Status Trees, Rev 1

Proposed references to be provided to applicants during examination:  
2-FR-0, Unit 2 Status Trees, Core Cooling F-0.2,  
pages 4 and 5

Learning Objective: OPL271FR-0 B.6.a  
Given a set of initial plant conditions, use FR-0 to  
correctly identify the:  
a. Identify required actions

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #  X  \_\_\_\_\_  
New \_\_\_\_\_

Question History: SQN Bank FR-C.3-B.5.A 001modified

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis  X  \_\_\_\_\_

10 CFR Part 55 Content: ( 43.5 / 45.13 )

10CFR55.43.b ( n/a )

Comments: Modified stem and all choices, changed question being asked, and made  
open reference,

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

W/E10 EK2.1 026

Given the following:

- Unit 1 tripped due to a loss of off-site power.
- While performing a natural circulation cooldown, the crew determines the need for a more rapid cooldown and transitions to ES-0.3, "Natural Circulation Cooldown with Steam Voids in Vessel (with RVLIS)."

When establishing conditions to continue the RCS natural circulation cooldown and de-pressurization, which ONE of the following identifies the range that is established for pressurizer level and why?

Pressurizer level will be established ...

- A. greater than 90% to enable the restart of a RCP when off-site power is restored.
- B. greater than 90% to accommodate the rapid decrease in pressurizer level when the voids in the head collapse.
- C. between 20% and 30% to accommodate any growth of the void in the vessel head.
- D. between 20% and 30% to enable pressurizer liquid to be maintained at saturated conditions using pressurizer heaters.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Establishing level at greater than 90% is not correct. Plausible because if the RVLIS value is below 104%, then the pressurizer level is raised to 90% prior to starting the RCP as described in the step prior to establish pressurizer level between 20% and 30%.*
- B. *Incorrect, Establishing level at greater than 90% is not correct. Plausible because the level would be raised to greater than 90% to accommodate the collapse of the voids following the start of a RCP.*
- C. **CORRECT**, *As described in ES-0.3 step 4, the pressurizer level will be established between 20% and 30% to accommodate any void growth.*
- D. *Incorrect, establishing between 20% and 30% is correct but it is not so that the heaters can maintain the pressurizer liquid at saturated conditions. Plausible because maintaining the pressurizer liquid at saturated condition is important to prevent rapid large pressure drops when the pressurizer level is reduced.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 26

Tier 1 Group 2

K/A W/E10 EK2.1

Natural Circulation with Steam Void in Vessel with/without RVLIS  
Knowledge of the interrelations between the (Natural Circulation with Steam  
Void in Vessel with/without RVLIS) and the following:  
Components, and functions of control and safety systems, including  
instrumentation, signals, interlocks, failure modes, and automatic and  
manual features.

Importance Rating: 3.3 / 3.5

Technical Reference: ES-0.3, Natural Circulation Cooldown with Steam Void  
In Vessel, Rev. 13

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271ES-0.3 B.2.a  
Discuss ES-0.3 entry conditions.  
a. Describe the setpoints, interlocks, and automatic  
actions associated with ES-0.3 entry conditions.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New   X   \_\_\_\_\_

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge   X    
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 / 45.7 )

10CFR55.43.b ( n/a )

Comments: New question

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

W/E16 EA1.3 027

Given the following:

- A LOCA is in progress on Unit 2.
- The crew transitions to FR-Z.3, "High Containment Radiation."
- The CRO is directed to verify the Emergency Gas Treatment System (EGTS) operation.

Which ONE of the following identifies operating conditions on the EGTS that would indicate the system is operating within normal operating limits?

<u>Annulus <math>\Delta P</math></u>	<u>EGTS Filter Bank <math>\Delta P</math>s</u>
A✓ -0.5" to -0.6" water $\Delta P$	3.5" to 5.0" water $\Delta P$
B. -0.5" to -0.6" water $\Delta P$	9.5" to 10.5" water $\Delta P$
C. -5.4" to -5.5" water $\Delta P$	3.5" to 5.0" water $\Delta P$
D. -5.4" to -5.5" water $\Delta P$	9.5" to 10.5" water $\Delta P$

DISTRACTOR ANALYSIS:

- A. *CORRECT, during an accident the annulus vacuum fans are stopped and the EGTS clean up fans are running. The clean up fans are checked to be controlling annulus delta P at more negative than -0.5" water pressure (and the system SO identifies the normal orating limits are 0.2 to 1.2 inches of water pressure) and the clean up fan filter bank delta P is checked to be in its normal operating range of between 1' and 7" of water*
- B. *Incorrect, the Annulus delta P is within the normal operating limit but the clean up fan filter bank delta P is outside the normal operating band. Plausible because the annulus delta P is within the operating band and while the filter bank delta P is outside the operating band, it is only slightly above the band and still on the scale of the instrument being read.*
- C. *Incorrect, the Annulus delta P is outside the normal operating limits but the clean up fan filter bank delta P is within the normal operating band. Plausible because the filter bank delta P is within the operating band and the annulus delta P would be within the normal band if the annulus vacuum fans were in service and controlling pressure.*
- D. *Incorrect, the Annulus delta P and the clean up fan filter bank delta Ps are outside the normal operating limit and band. Plausible because the annulus delta P would be normal if the annulus vacuum fans were in service and controlling pressure and while the filter bank delta P is outside the operating band, it is only slightly above the band and still on the scale of the instrument being read.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 27

Tier 1 Group 2

K/A W/E16 EA1.3

High Containment Radiation

Ability to operate and / or monitor the following as they apply to the (High Containment Radiation)

Desired operating results during abnormal and emergency situations.

Importance Rating: 2.9 / 3.3

Technical Reference: FR-Z.3, High Containment Radiation, Rev. 7  
EA-65-1, EGTS Operation, Rev.1  
0-S0-65-1, Emergency Gas Treatment System Air  
Cleanup and Annulus Vacuum, Rev 18

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271FR-Z.3 B.2.b  
Discuss the FR-Z.3 entry requirements  
b. Describe the requirements associated with FR-Z.3  
entry conditions.  
OPT200.EGTS B.4.d  
Describe the following characteristics of each major  
component in the EGTS system:  
d. Normal operating parameters

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New  \_\_\_\_\_

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis  \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 / 45.5 / 45.6 )

10CFR55.43.b ( n/a )

Comments:

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

003 A3.03 028

Given the following:

- Unit 1 is Mode 4 with heatup in progress.
- All Reactor Coolant Pumps (RCPs) are in service.
- Pressurizer pressure is 435 psig.

Which ONE of the following identifies the RCP #1 Seal  $\Delta P$  minimum limit with the RCPs in service and how the  $\Delta P$  indication will change as pressurizer pressure is raised to 900 psig?

- A. 220 psid;  
Indication will rise and go off scale high.
- B. 220 psid;  
Indication will rise and stabilize at approximately 400 psid.
- C. 325 psid;  
Indication will rise and go off scale high.
- D. 325 psid;  
Indication will rise and stabilize at approximately 400 psid.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

DISTRACTOR ANALYSIS:

- A. CORRECT, The minimum RCP #1 Seal delta P limit is 220 psid and the indication will rise (as) go off scale high as pressurizer pressure is raised. The top of the instrument scale is 500 psid . With pressurizer pressure 900 psig and VCT pressure 17 to 50 psig, the indication is off scale high.
- B. Incorrect, 220 psid is the RCP #1 Seal delta P limit but the indication will not stabilize at 400 psid as the pressurizer pressure is increased. Plausible because 220 psid is correct. The indication rising and stabilizing at 400 psig as the pressure is raised is plausible because 400 psig is the pressure identified in the annunciator response instruction as the RCS pressure being too low (less than approx 400 psi) being a probable cause for the low delta P alarm.
- C. Incorrect, 325 psid is not the RCP #1 Seal delta P limit but the indication will go off scale high as the pressurizer pressure is increased. Plausible because 325 psig is the pressure identified in 0-GO-1 Precaution 'J' as the approximate pressure the RCS will be pressurized to facilitate RCP operation and the indication going off scale high as the pressure is raised is correct.
- D. Incorrect, 325 psid is not the RCP #1 Seal delta P limit and the indication will not stabilize at 400 psid as the pressurizer pressure is increased. Plausible because 325 psig is the pressure identified in 0-GO-1 Precaution 'J' as the approximate pressure the RCS will be pressurized to facilitate RCP operation and identified in 0-SO-68-2 as the pressure required will support the #1 seal minimum delta P requirements of 220 psid. The indication rising and stabilizing at 400 psig as the pressure is raised is plausible because 400 psig is the pressure identified in the annunciator response instruction as the RCS pressure being too low (less than approx 400 psi) being a probable cause for the low delta P alarm.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 28

Tier 2 Group 1

K/A 003 A3.03

Reactor Coolant Pump System (RCPS)

Ability to monitor automatic operation of the RCPS, including:

Seal D/P

Importance Rating: 3.2 / 3.1

Technical Reference: 0-GO-1, Unit startup From Cold Shutdown to Hot Standby, Rev. 0054

1-SO-68-2, Reactor Coolant Pumps, Rev. 30

1-AR-M5-B, CVCS Seal Water and RCP

1-XA-55-5B, rev 36

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.RCP B.4.h & .5.a

Describe the following items for each major component in the Reactor Coolant pump system as described in this lesson plan:

h. instrumentation and indications

Describe the operation of the RCP system as it relates to the following:

a. Precautions and limitations

Question Source:

Bank # \_\_\_\_\_

Modified Bank #   X   \_\_\_\_\_

New \_\_\_\_\_

Question History: SQN question RCP-B.4 004 modified

Question Cognitive Level:

Memory or fundamental knowledge   X   \_\_\_\_\_

Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 / 45.5 )

10CFR55.43.b ( n/a )

Comments: SQN question RCP-B.4 004 modified by changing stem , distracter and adding second part to question, and relocating correct answer.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

004 A1.12 029

Given the following:

- Unit 1 at 100% power at EOL conditions.
- CVCS Mix Bed A being used for deborating.

Which ONE of the following identifies the changes in Letdown Flow & Temperature that would increase the rate of boron removal from the RCS?

Letdown Flow

Letdown Temperature

- |                           |         |
|---------------------------|---------|
| A. Raised from 45-75 gpm  | Raised  |
| B✓ Raised from 45-75 gpm  | Lowered |
| C. Lowered from 75-45 gpm | Raised  |
| D. Lowered from 75-45 gpm | Lowered |

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

DISTRACTOR ANALYSIS:

- A. *Incorrect, Increasing the flow rate through the demineralizer will allow more ion exchange to take place and also more of a change out of the boron concentration in the RCS via higher charging flow but raising the letdown temperature would cause the demineralizer to release boron back into the system. Plausible because raising the flow rate through the demineralizer is correct and the effect on the change in letdown temperature could be inappropriately reversed.*
- B. **CORRECT**, *Increasing the flow rate through the demineralizer will allow more ion exchange to take place and also more of a change out of the boron concentration in the RCS via higher charging flow. Dropping the letdown temperature will cause the demineralizer to have a greater affinity for removing boron.*
- C. *Incorrect, Decreasing the flow rate through the demineralizer will allow less ion exchange to take place and also less of a change out of the boron concentration in the RCS via lower charging flow and raising the letdown temperature would cause the demineralizer to release boron back into the system. Plausible because if the flow rate through the demineralizer was raised above the capacity of the mix bed, the bed may not remove as much boron and the effect on the change in letdown temperature could be inappropriately reversed.*
- D. *Incorrect, Decreasing the flow rate through the demineralizer will allow less ion exchange to take place and also less of a change out of the boron concentration in the RCS via lower charging flow but dropping the letdown temperature will cause the demineralizer to have a greater affinity for removing boron. Plausible because if the flow rate through the demineralizer was raised above the capacity of the mix bed, the bed may not remove as much boron and the effect on the change in letdown temperature is correct.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 29

Tier 2 Group 1

K/A 004 A1.12

Chemical and Volume Control System

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CVCS controls including:

Rate of boron concentration reduction in RCS as a function of letdown flow while deborating demineralizer is in service

Importance Rating: 2.8 / 3.2

Technical Reference: 1-SO-62-9, CVCS Purification System, Rev 37  
AOP-C.02, Uncontrolled Boron Concentration Changes, Rev.6  
Components - Demineralizers and Ion Exchangers, Rev 4

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271AOP-C.02 B.2.d  
Describe the AOP-C.02 entry conditions.  
d. Describe the plant parameters that may indicate an Uncontrolled RCS Boron Concentration Change.  
Components - Demineralizers and Ion Exchangers  
#9 Describe the demineralizer characteristics that can cause a change in boron concentration.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New  \_\_\_\_\_

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge   
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: ( 41.5 / 45.5 )

10CFR55.43.b ( n/a )

Comments: New question

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

004 A2.25 030

Given the following:

- Unit 1 is operating at 30% power for an extended chemistry hold with normal letdown in service.
- Control rods are in automatic.

Which ONE of the following identifies which CCS Heat Exchanger leak will cause inadvertent control rod motion and which section of AOP-C.02, "Uncontrolled RCS Boron Concentration Changes" will apply?

<u>CCS Heat Exchanger</u>	<u>AOP-C.02 Section</u>
A. Letdown Heat Exchanger	Uncontrolled or unplanned boration in Mode 1 or 2
B. Letdown Heat Exchanger	Uncontrolled or unplanned dilution in Mode 1 or 2
C. Seal Water Heat Exchanger	Uncontrolled or unplanned boration in Mode 1 or 2
D✓ Seal Water Heat Exchanger	Uncontrolled or unplanned dilution in Mode 1 or 2

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

DISTRACTOR ANALYSIS:

- A. *Incorrect, the Letdown HX RCS side is at higher pressure than the CCS system therefore RCS will leak into the CCS system. No dilution event occurs. Plausible in that the LD HX is one of the return paths to the CVCS system and if CCS did get into the system this way a change in boron concentration would occur.*
- B. *Incorrect, the Letdown HX RCS side is at higher pressure than the CCS system therefore RCS will leak into the CCS system. No dilution event occurs. Plausible in that the LD HX is one of the return paths to the CVCS system and if CCS did get into the system this way a change in boron concentration would occur.*
- C. *Incorrect, the second part of this distracter is incorrect as a dilution would occur verses a boration. It is plausible based on the student being given the fact that rods move in the stem and having to understand the concept of reactivity effects on RCS chemistry and rod control response to the resultant temperature change.*
- D. *Correct, the Seal Water HX RCS side is at a lower pressure than the CCS system therefore unborated water will leak into the CVCS system. This will cause rods to move inward in automatic and is considered an uncontrolled dilution.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 30

Tier 2 Group 1

K/A 004 A2.25

Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:  
Uncontrolled boration or dilution

Importance Rating: 3.8 / 4.3

Technical Reference: AOP-C.02, "Uncontrolled RCS Boron Concentration Changes", Rev 6

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271AOP-C.02 B.2.d & B.4  
Describe AOP-C.02 entry conditions  
d. Describe plant parameters that may indicate an uncontrolled RCS boron concentration change  
Upon entry into AOP-C.02, diagnose the applicable condition and transition to the appropriate procedural section for response.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #  \_\_\_\_\_  
New  \_\_\_\_\_

Question History: PBNP 2006 LOR Exam bank

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis  \_\_\_\_\_

10 CFR Part 55 Content: ( 41.5/ 43/5 / 45/3 / 45/5 )

10CFR55.43.b ( n/a )

Comments: Modified stem to include procedure application, modified distracters to use only two CCS supplied heat exchangers and include correct procedure section.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

005 K1.13 031

With Unit 1 operating at 100% power, which ONE of the following identifies why the Residual Heat Exchanger Cross-tie Isolation valves 1-FCV-74-33 and 1-FCV-74-35 are required to be maintained in the open position?

- A. Ensures capability to inject into RCS hot legs in the event an RHR pump fails during response to a LOCA.
- B. Ensures both trains of RHR spray would remain available the event an RHR pump fails during response to a LOCA.
- C✓ Ensures capability to inject into all four RCS cold legs in the event an RHR pump fails during response to a LOCA.
- D. Ensures Low Pressure Injection will be provided through both RHR heat exchangers in the event an RHR pump fails during response to a LOCA.

*DISTRACTOR ANALYSIS:*

- A. *Incorrect, the reason is not to ensure capability to inject into RCS hot legs in the event an RHR pump fails during response to a LOCA. Plausible because the hot leg injection line physically connects to the RHR system between the FCVs and the valves are operated during Hot leg Injection alignment.*
- B. *Incorrect, the reason is not to ensure both trains of RHR spray would remain available the event an RHR pump fails during response to a LOCA. Plausible because each RHR spray line is physically connected to one train of RHR piping that would prevent train interaction when either FCV was closed and the valves are operated during Hot leg Injection alignment.*
- C. *CORRECT, The valves must be maintained open so either Train of RHR low pressure injection would inject into all four cold legs. if either valve was closed, neither pump could inject into all 4 legs. Precaution in 0-SO-74-1 identifies the "Failure to maintain FCV-74-33 and FCV-74-35 (RHR Crosstie Valves) ...**OPEN** ...while applicable unit is in modes 1, 2, or 3 will result in entering LCO 3.0.3.*
- D. *Incorrect, the reason is not to ensure Low Pressure Injection will be provided through both RHR heat exchangers in the event an RHR pump fails during response to a LOCA. Plausible because the valves are identified as RHR heat exchanger crosstie valves but they are on the outlet of the heat exchanger and not on the inlet.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 31

Tier 2 Group 1

K/A 005 K1.13

Residual Heat Removal System (RHRS)

Knowledge of the physical connections and/or cause effect relationships  
between the RHRS and the following systems:

SIS

Importance Rating: 3.3 / 3.5

Technical Reference: 0-S0-74-1, Residual Heat Removal System, Rev 68  
1,2-47W810-1, R53

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200 RHR B.5.a  
Describe the operation of the RHR:  
a. Precautions and limitations

Question Source:

Bank #   X    
Modified Bank #             
New           

Question History: SQN bank question RHR- B-4 001 with wording  
changes in the stem (but not a substantial change)  
and 2 distracters changed and the correct answer  
relocated.

Question Cognitive Level:

Memory or fundamental knowledge   X    
Comprehension or Analysis           

10 CFR Part 55 Content: ( 41.2 to 41.9 / 45.7 to 45.8 )

10CFR55.43.b ( n/a )

Comments: SQN bank question RHR- B-4 001 with wording changes in the stem and  
2 distracters changed and the correct answer relocated.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

006 K5.06 032

The unit is experiencing a large break LOCA. Which ONE of the following describes the order of ECCS component injection as the RCS pressure drops?

- A. CCPs, SI Pumps, RHR Pumps, Cold Leg Accumulators.
- B. SI Pumps, CCPs, Cold Leg Accumulators, RHR Pumps.
- C. CCPs, SI Pumps, Cold Leg Accumulators, RHR Pumps.
- D. SI Pumps, CCPs, RHR Pumps, Cold Leg Accumulators.

*DISTRACTOR ANALYSIS:*

- A. Incorrect, plausible if student does not know that accumulator injection pressure into the RCS is greater than the discharge head of the RHR pumps.*
- B. Incorrect, plausible if student does not know that SI pump developed head is less than CCP developed head.*
- C. CORRECT, CCPs inject immediately, SI pumps inject ~ 1500 psig, CLA's around 700 psig and RHR pumps inject at ~ 180 psig.*
- D. Incorrect, plausible if student does not know that accumulator injection pressure into the RCS is greater than the discharge head of the RHR pumps or that SI pump developed head is less than CCP developed head.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 32

Tier 2 Group 1

K/A 006 K5.06

Knowledge of the operational implications of the following concepts as they apply to ECCS:

Relationship between ECCS flow and RCS pressure

Importance Rating: 3.5 / 3.9

Technical Reference: FSAR Amendment 20  
OPT200.ECCS, ECCS Lesson Plan, Rev. 3

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.ECCS B.4.d & .e  
Describe the following items for each major component in the ECCS:  
d. Normal operating parameters  
e. Component operation

Question Source:

Bank #   X    
Modified Bank #             
New           

Question History: SQN Bank Question ECCS-B.3

Question Cognitive Level: Lower

10 CFR Part 55 Content: ( 4.1/4.5 )

10CFR55.43.b ( n/a )

Comments: Minor change to stem and reordered distracters

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

007 A2.01 033

Given the following:

- Unit 2 has experienced a reactor trip.
- ES-0.1, "Reactor Trip Response" is in progress.
- The following conditions exist:
  - T-avg is 545°F and rising slowly.
  - RCS pressure is 2220 psig and rising slowly.

Subsequently, PZR PORV PCV-68-334, sticks open and the associated block valve will NOT close.

The maximum temperature in PZR Relief Tank (PRT) will be \_\_\_\_\_ and the correct crew actions are to \_\_\_\_\_.

- A✓ less than 360°F  
manually actuate SI and return to E-0, "Reactor Trip or Safety Injection."
- B. less than 360°F  
remain in ES-0.1, unless an auto SI occurs, then transition to E-0, "Reactor Trip or Safety Injection."
- C. greater than 360°F  
manually actuate SI and return to E-0, "Reactor Trip or Safety Injection."
- D. greater than 360°F  
remain in ES-0.1, unless an auto SI occurs, then transition to E-0, "Reactor Trip or Safety Injection."

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

DISTRACTOR ANALYSIS:

- A. CORRECT, the highest possible temperature that the PRT could be prior to the rupture disk blowing out (@85 psig) is slightly less than 360 °F. The expected prudent operator action is to manually SI prior to getting the low pressurizer pressure auto SI. This would then require a transition to E-0.
- B. Incorrect, the highest possible temperature that the PRT could be prior to the rupture disk blowing out (@85 psig) is slightly less than 360 °F. The expected prudent operator action is to manually SI prior to getting the low pressurizer pressure auto SI. This would then require a transition to E-0. The first part of the distractor is plausible because it is correct. The second part of the distractor is plausible because the ES-0.1 FOP manual SI requirements are explicitly stated for RCS subcooling and pressurizer level (verses low pressurizer pressure) and one option would be to remain in ES-0.1 until an auto SI occurred. However, this would not meet operations expectations.
- C. Incorrect, the highest possible temperature that the PRT could be prior to the rupture disk blowing out (@85 psig) is slightly less than 360 °F. The expected prudent operator action is to manually SI prior to getting the low pressurizer pressure auto SI. This would then require a transition to E-0. The first part of the distractor is plausible because it is slightly above the maximum temperature possible. The second part of the distractor is plausible because it is correct.
- D. Incorrect, the highest possible temperature that the PRT could be prior to the rupture disk blowing out (@85 psig) is slightly less than 360 °F. The expected prudent operator action is to manually SI prior to getting the low pressurizer pressure auto SI. This would then require a transition to E-0. The first part of the distractor is plausible because it is slightly above the maximum temperature possible. The second part of the distractor is plausible because the ES-0.1 FOP manual SI requirements are explicitly stated for RCS subcooling and pressurizer level (verses low pressurizer pressure) and one option would be to remain in ES-0.1 until an auto SI occurred. However, this would not meet operations expectations.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 33

Tier 2 Group 1

K/A 007 A2.01

PZR Relief Tank/Quench Tank System (PRTS)

Ability to (a) predict the impacts of the following or operations on the PRT; and  
(b) based on those predictions, use procedures to correct, control, or mitigate  
the consequences of those malfunctions or operations

Importance Rating: 3.9 / 4.2

Technical Reference: E-0, "Reactor Trip or Safety Injection", R30.  
ES-0.1, "Reactor Trip Response", R32.  
EDM-4, "Emergency Procedure Users Guide"  
Steam tables, R20.

Proposed references to be provided to applicants during examination:

**Mollier Diagram**

Learning Objective: OPT200.PZRPCS B.4.e,  
Describe the following items for each major component in the  
PZR pressure control system and PZR relief tank as described  
in this lesson:  
e. Component operation  
OPL271ES-0.1 B.5  
Describe the conditions and reasons for transitions within this  
procedure and transitions to other procedures.  
OPL271EPM-4,  
Identify general operating crew responsibilities during  
emergency operations including appropriate implementation  
of prudent operator actions.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #   X   \_\_\_\_\_  
New \_\_\_\_\_

Question History: Point Beach question modified

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis   X   \_\_\_\_\_

10 CFR Part 55 Content: (41.5 / 43.5 / 45.3 / 45.13 )

10CFR55.43.b ( n/a )

Comments:

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

007 A4.09 034

Given the following:

- Unit 1 is operating at 100% RTP BOL, with all systems in a normal alignment.
- Annunciator "TS-62-75 LOW PRESSURE LETDOWN RELIEF TEMP HIGH" on 1-M-6 is in alarm.

If the low pressure letdown line relief valve is leaking through, which ONE of the following describes the effects on both PZR level and PRT level?

	<u>PZR Level</u>	<u>PRT Level</u>
A.	lowering	rising
B.	lowering	stable
C✓	stable	rising
D.	stable	stable

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, PZR level will be stable vs. lowering. Plausible as the RCS will be losing inventory via the relief leaking through and VCT level will be dropping. Inventory will be made up by auto makeup to the VCT and charging. PRT level will be rising as the LD relief discharges to it.*
- B. *Incorrect, PZR level will be stable vs. lowering. Plausible as the RCS will be losing inventory via the relief leaking through and VCT level will be dropping. Inventory will be made up by auto makeup to the VCT and charging. PRT level will be rising (vs. stable) as the LD relief discharges to it. This is plausible as other CTMT relief's discharge to other places (CTMT Floor for example) and the student will need to know that the LD line relief discharges to the PRT.*
- C. **CORRECT**, PZR level will be stable vs. lowering and the PRT level will be rising as the LD line relief discharges to it.
- D. *Incorrect, PZR level will be stable vs. lowering. Plausible as the RCS will be losing inventory via the relief leaking through and VCT level will be dropping. Inventory will be made up by auto makeup to the VCT and charging. PRT level will be rising (vs. stable) as the LD relief discharges to it. This is plausible as other CTMT relief's discharge to other places (CTMT Floor for example) and the student will need to know that the LD line relief discharges to the PRT.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 34

Tier 2 Group 1

K/A 007 A4.09

Ability to manually operate and/or monitor <sup>in</sup> it the control room:  
Relationships between PZR level and changing levels of the PRT and bleed  
holdup tank

Importance Rating: 2.5 / 2.7

Technical Reference: 1-47W809-1 Flow Diagram CVCS, R74  
1-47W813-1 Flow Diagram RCS, R53

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL200.CVCS B 4.e & j  
Describe the following characteristics of each major  
component in the CVCS system:  
e. Component operation  
j. Failure mode

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New   X   \_\_\_\_\_

Question History: NEW

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis   X   \_\_\_\_\_

10 CFR Part 55 Content: (41.7 / 45.5 to 45.8)

10CFR55.43.b ( n/a )

Comments:

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

008 K3.01 035

Which ONE of the following identifies how a #3 RCP Thermal Barrier Heat Exchanger leak large enough to cause an automatic isolation would be detected and the effect the isolation would have on the CCS flow through the #4 RCP Thermal Barrier Heat Exchanger?

<u>Detected by Thermal Barrier CCS...</u>	<u>Effect on #4 RCP Thermal Barrier CCS flow</u>
A. Inlet flow > Outlet flow	Increase
B. Inlet flow > Outlet flow	Be isolated
C. Outlet flow > Inlet flow	Increase
D. Outlet flow > Inlet flow	Be isolated

DISTRACTOR ANALYSIS:

- A. *Incorrect, Inlet flow is not greater than outlet flow (The inlet flow is reduced and the outlet flow increases) and the flow on #4 RCP does not increase. Plausible because the inlet flow would be higher than the outlet flow if the CCS leaked into the thermal and the flow on #4 RCP thermal barrier would increase if only the #3 RCP thermal barrier was isolated.*
- B. *Incorrect, Inlet flow is not greater than outlet flow. The inlet flow is reduced and the outlet flow increases. The #4 RCP thermal barrier is isolated. Plausible because the inlet flow would be higher than the outlet flow if the CCS leaked into the thermal and the effect on #4 RCP thermal barrier is correct.*
- C. *Incorrect, Outlet flow being greater than inlet flow is correct but the delta flow is sensed on the common header, thus a leak in one will result in isolation to all 4 RCP thermal barriers. Plausible because the inlet flow is higher than the outlet flow and the flow on #4 RCP thermal barrier would increase if only the #3 RCP thermal barrier was isolated.*
- D. **CORRECT**, *A leak in the thermal barrier would cause RCS leakage into the CCS this would reduce the inlet flow and increase the CCS return flow causing differential flow to isolate the thermal barriers. This delta flow is sensed on the common header, thus a leak in one will result in isolation of all 4 RCP thermal barriers.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 35

Tier 2 Group 1

K/A 008 K3.01

Component Cooling Water System (CCWS)

Knowledge of the effect that a loss or malfunction of the CCWS will have on the following:

Loads cooled by CCWS

Importance Rating: 3.4 / 3.5

Technical Reference: 1,2-47W611-70-3, R14

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.CCS B.4.e & .h

Describe the following characteristics of each major component in the Component Cooling Water System.

e. Component operation

h. Instrumentation and Indications

Question Source:

Bank # \_\_\_\_\_

Modified Bank #   X   \_\_\_\_\_

New \_\_\_\_\_

Question History: SQN bank question CCS-B.4 G 001 modified

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_

Comprehension or Analysis   X   \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 / 45.6 )\* (not listed in NuReg 1122)

10CFR55.43.b ( n/a )

Comments: SQN bank question CCS-B.4 G 001 modified

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

010 G2.4.30 036

Given the following:

- Unit 1 is in Mode 3.
- The block valve for pressurizer PORV 334 is closed due to leakage through the PORV.
- 1-XS-68-340D, "Press Control Channel Selector," is in the 340/334 position.
- 1-PIC-68-340A, "PZR Pressure Control," is in MANUAL with output at 28%.

Subsequently, an RCS over pressure transient occurred and the crew was able to reduce RCS pressure below the safety limit in less than 1 minute.

Which ONE of the following identifies whether PORV 340 would have automatically opened during this event and if NRC notification is required?

PORV 340 would have...

NRC notification required...

- |                    |   |
|--------------------|---|
| A. opened          | No, because pressure was reduced below the safety limit within 5 minutes. |
| B. opened          | Yes, because the safety limit was exceeded.                               |
| C. remained closed | No, because pressure was reduced below the safety limit within 5 minutes. |
| D✓ remained closed | Yes, because the safety limit was exceeded.                               |

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

DISTRACTOR ANALYSIS:

- A. *Incorrect, PORV 340 would not have opened and the NRC must be notified that the RCS pressure Safety Limit has been violated. Plausible because the PORV would have remained closed even though its setpoint was exceeded and the PORV would have opened if the master controller had been in automatic (The other PORV would have opened even with the master controller in manual.) and the safety limit does contain a 5 minute requirement. But it is that the RCS pressure is required to be reduced below the safety limit within 5 minutes if the plant is in Mode 5 not to the required NRC notification.*
- B. *Incorrect, PORV 340 would not have opened and the NRC must be notified that the RCS pressure Safety Limit has been violated. Plausible because the PORV would have remained closed even though its setpoint was exceeded and the PORV would have opened if the master controller had been in automatic (The other PORV would have opened even with the master controller in manual.) and the NRC being required to be notified if the safety limit is exceeded is correct.*
- C. *Incorrect, The PORV 340 would have remained close but the NRC must be notified that the RCS pressure Safety Limit has been violated. Plausible because the PORV would have remained closed even though its setpoint was exceeded and the PORV would have opened if the master controller had been in automatic (The other PORV would have opened even with the master controller in manual.) and the safety limit does contain a 5 minute requirement. But it is that the RCS pressure is required to be reduced below the safety limit within 5 minutes if the plant is in Mode 5 not to the required NRC notification.*
- D. **CORRECT**, *With the master pressure controller in manual and its output at 28%, PORV 340 cannot open because the output of the master pressure controller has to be at an output that equates to 2335 psig (89%) to make one half of the logic for opening the valve. the other half is made from the output of Channel IV (PT-322). With the RCS pressure rising above the T/S RCS pressure Safety Limit has been violated and this violation requires NRC notification.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 36

Tier 2 Group 1

K/A 010 G2.4.30

Pressurizer Pressure Control System (PZR PCS)

Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.

Importance Rating: 2.7 / 4.1

Technical Reference: Technical Specification Section 2.0, Safety Limits,  
Amendment 322  
AOP-I.04, Pressurizer Instrument and Control  
Malfunctions, Rev. 9  
10CFR50.36  
OPT200.TS-Intro, Rev 2

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.TS-Intro B.2  
Identify the five (2) sets of Facility Operating License  
Conditions list in parts 2A, B, C, D, and E, with which  
the facility must comply

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New  \_\_\_\_\_

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis  \_\_\_\_\_

10 CFR Part 55 Content: ( 41.10 / 43.5 / 45.11 )

10CFR55.43.b ( n/a )

Comments: New question

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

012 K6.03 037

Given the following:

- Unit 1 shutdown is in progress.
- Reactor power is 14% and decreasing.
- Intermediate Range NI-36 fails HIGH.

Which ONE of the following identifies how the failure of the NI will affect the reactor trip system and the effect the failure will have on the Source Range NIs?

<u>Reactor Trip System</u>	<u>Effect on Source Range NIs</u>
A. Reactor trip will occur at the time of failure.	Source Range NIs will AUTOMATICALLY reinstate.
B. Reactor trip will occur at the time of failure.	Source Range NIs will have to be MANUALLY reinstated.
C. Reactor trip will occur if the power reduction is continued.	Source Range NIs will AUTOMATICALLY reinstate.
D✓ Reactor trip will occur if the power reduction is continued.	Source Range NIs will have to be MANUALLY reinstated.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, the failure of the NI-36 will not cause a trip of the reactor because the IR instrument trips are not automatically enabled until the power level is reduced below 10% (P-10) and the SR instruments will not automatically re-instate with an IR instrument failed high. Plausible because the reactor would have tripped if power level had been less than 10% at the time of the IR instrument failure and the SR instruments do require manual re-instatement.*
- B. *Incorrect, the failure of the NI-36 will not cause a trip of the reactor because the IR trips are not automatically enabled until the power level is reduced below 10% (P-10). The SR instruments require manual re-instatement due to the failed IR instrument is correct. Plausible because the reactor would have tripped if power level had been less than 10% at the time of the IR instrument failure and the SR instruments would normally re-instate automatically following a reactor trip.*
- C. *Incorrect, The reactor not tripped until power is further reduced is correct but the SR instruments will not automatically re-instate with an IR instrument failed high. Plausible because the reactor not tripping unless the power reduction is continued is correct and the SR instruments would normally re-instate automatically following a reactor trip.*
- D. **CORRECT**, *the failure of the NI-36 will not cause a trip of the reactor until the IR instrument trips are automatically enabled when the power level is reduced below 10% (P-10). Both IR instruments must be less than  $1.4 \times 10^{-4}$  (P-6) for the source range instruments to automatically re-instate. With the NI-36 failed high, the source range instruments would have to be manually re-instated.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 37

Tier 2 Group 1

K/A 012 K6.03

Reactor Protection System

Knowledge of the effect of a loss or malfunction of the following will have on  
RPS: Trip Logic Circuits

Importance Rating: 3.1 / 3.5

Technical Reference: 0-47W611-99-1 R11  
0-47W611-99-2, R13

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.RPS B.5.d

Describe the operation of the Reactor Protection &  
Engineered Safety Features Actuation Systems:  
d. How a component failure will affect system

operation

OPT200.NIS B.5.f,

Describe the operation of the NIS system:  
f. How an instrument failure will affect system  
operation.

Question Source:

Bank #     X      
Modified Bank #             
New           

Question History: WBN Bank

Question Cognitive Level:

Memory or fundamental knowledge             
Comprehension or Analysis     X    

10 CFR Part 55 Content: (41.7 / 45.7 )

10CFR55.43.b ( n/a )

Comments:

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

013 K5.02 038

Given the following:

- A Safety Injection occurred 30 minutes ago due to a faulted S/G on Unit 1.
- The crew has transitioned to ES-1.1, "SI Termination."
- Reactor trip breaker "A" failed to open.
- Both SIS Reset pushbuttons have been depressed.
- Both SI Pump control switches have been placed to STOP and returned to A-Auto.

Which ONE of the following describes the status of "A" Train Safety Injection (SI) and the 1A-A SI Pump?

	<u>"A" Train SI</u>	<u>1A-A SI Pump</u>
A.	RESET	ON
B.	RESET	OFF
<input checked="" type="radio"/> C.	NOT RESET	ON
D.	NOT RESET	OFF

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

DISTRACTOR ANALYSIS:

- A. *Incorrect, SI train "A" will not be reset as the "A" reactor trip breaker will not make up P-4, which is necessary to reset SI train "A". Because "A" train SI did not reset, 1A-A SI pump will restart after its control switch is returned to the "A-Auto" position. The first part of this distracter is plausible because the train would reset if the trip breaker had opened. The second part of this distracter is plausible as the SI pump will stop whether SI is reset or not, but will only remain off if its train of SI had reset.*
- B. *Incorrect, SI train "A" will not be reset as the "A" reactor trip breaker will not make up P-4, which is necessary to reset SI train "A". Because "A" train SI did not reset, 1A-A SI pump will restart after its control switch is returned to the "A-Auto" position. The first part of this distracter is plausible because the train would reset if the trip breaker had opened. The second part of the distracter is correct.*
- C. **CORRECT**, *SI train "A" will not be reset as the "A" reactor trip breaker will not make up P-4, which is necessary to reset SI train "A". Because "A" train SI did not reset, 1A-A SI pump will restart after its control switch is returned to the "A-Auto" position.*
- D. *Incorrect, SI train "A" will not be reset as the "A" reactor trip breaker will not make up P-4, which is necessary to reset SI train "A". Because "A" train SI did not reset, 1A-A SI pump will restart after its control switch is returned to the "A-Auto" position. The first part of this distracter is plausible as it is correct. The second part of this distracter is plausible as the SI pump will stop whether SI is reset or not, but will only remain off if its train of SI had reset.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 38

Tier 2 Group 1

K/A 013 K5.02

Knowledge of the operational implications of the following concepts as they apply to the ESFAS: Safety system logic and reliability

Importance Rating: 2.9 / 3.3

Technical Reference: ES-1.1, SI Termination, Rev. 10  
1-47W611-63-1 SI System, R4

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.RPS B.5.e  
Describe the operation of the Reactor Protection System and the Engineered Safety Features Actuation Systems:  
e. How a support system failure will affect system operation.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_X\_\_\_\_\_  
New \_\_\_\_\_

Question History: SQN Exam Bank ES-1.2-B.2A 001

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis \_\_\_\_\_X\_\_\_\_\_

10 CFR Part 55 Content: ( 41.5 / 45.7 )

10CFR55.43.b ( n/a )

Comments: Modified stem for different initial conditions, changed ES-1.2 to ES-1.1 as procedure in effect. Added additional information to include equipment to satisfy operational implications. Added second part to answer and distracters, to accomplish testing of operational implications as well.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

022 K3.02 039

Given the following:

- Unit 2 is operating at 100% power.
- Due to a loss of Lower Compartment Cooling, lower containment temperature has risen from 103°F to 119°F.
- Actions are in progress to restore cooling.

If the temperature continues to rise in containment, which ONE of the following describes the effect on pressurizer level indication?

The controlling pressurizer level channel will indicate slightly \_\_\_\_\_  
\_\_\_\_\_.

- A. higher than actual level, and remain lower than the cold-calibrated pressurizer level instrument.
- B. lower than actual level, and remain lower than the cold-calibrated pressurizer level instrument.
- C. higher than actual level, and remain higher than the cold-calibrated pressurizer level instrument.
- D. lower than actual level, and remain higher than the cold-calibrated pressurizer level instrument.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, When the containment atmospheric temperature rises, the pressurizer reference leg will heat up, causing density to decrease, and exerting less pressure on the reference leg side of the transmitter, resulting in an increase in the indicated level, however the controlling level channel will remain higher than the cold -calibrated instrument. Plausible because the level indicating slightly higher is correct and the relationship with the cold calibrated instrument could be reversed.*
- B. *Incorrect, The controlling level channel will indicate higher than the cold-calibrated channel not lower. Plausible if the effects of the temperature rise and relationship with the cold calibrated instrument are reversed.*
- C. *Correct, The cold calibrated pressurizer level instrument is calibrated for temperatures far lower than normal operating temperatures and will indicate lower. When the containment atmospheric temperature rises, the pressurizer reference leg will heat up, causing density to decrease, and exerting less pressure on the reference leg side of the transmitter. This will result in an increase in indicated level.*
- D. *Incorrect, The controlling level channel will indicate higher than the cold-calibrated channel not lower. Plausible if the effect of the temperature rise is reversed; because the relationship with the cold calibrated instrument is correct.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 39

Tier 2 Group 1

K/A 022 K3.02

Containment Cooling System (CCS)

Knowledge of the effect that a loss or malfunction of the CCS will have on the following:

Containment instrumentation readings

Importance Rating: 3.0 / 3.3

Technical Reference: 0-GO-13, Reactor Coolant System Drain and Fill Operations, Rev 59

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200PZRLCS B.4.e, .h,& .j  
Describe the following items for each major component in the Pressurizer Level Control System  
e. Component operation  
h. Instrumentation and indications  
j. Failure Modes

Question Source:

Bank #     X      
Modified Bank #             
New           

Question History: SQN bank question 022 K3.02 001

Question Cognitive Level:

Memory or fundamental knowledge             
Comprehension or Analysis   X  

10 CFR Part 55 Content: ( 41.7 / 45.6 )

10CFR55.43.b ( n/a )

Comments: SQN Audit 07  
Originally from WTSI Bank

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

025 A4.02 040

Given the following:

- Unit 1 at 100% RTP when a LOCA occurs.
- A Safety Injection occurs due to containment pressure.
- The containment pressure continues to rise above the Phase B setpoint.

Which ONE of the following identifies...

- (1) when the Containment Air Return Fans would automatically start  
and  
(2) the indicating light(s) on the MCR handswitch that would be LIT if the  
1A-A Air Return Fan tripped on overload when the start was attempted?

Containment Air Return Fans  
would automatically start...

If 1A-A tripped, the  
indicating light(s) LIT are the...

- |  |                        |
|--|------------------------|
| A. 10 minutes after the<br>Safety Injection signal.  | White ONLY.            |
| B. 10 minutes after the<br>Safety Injection signal.  | Green, White, and Red. |
| C. 10 minutes after the<br>Phase B isolation signal. | White ONLY.            |
| D✓ 10 minutes after the<br>Phase B isolation signal. | Green, White, and Red. |

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, The Containment Air Return Fans receive a start signal 10 minutes after the Phase B isolation signal (2.8 psig) is initiated (not 10 minutes after the SI initiation) and all 3 lights on the handswitch will be lit, (not just the green and white.) Plausible because the applicant could misapply the timer start time to the Hi containment pressure SI signal instead of the HI-HI (Phase B signal) and white lights are used in other applications to identify abnormal plant conditions.*
- B. *Incorrect, The Containment Air Return Fans receive a start signal 10 minutes after the Phase B isolation signal (2.8 psig) is initiated (not 10 minutes after the SI initiation) but all 3 lights on the handswitch will be lit. Plausible because the applicant could misapply the timer start time to the Hi containment pressure SI signal instead of the HI-HI (Phase B signal) and all 3 indicating lights being lit is correct.*
- C. *Incorrect, The Containment Air Return Fans do receive a start signal 10 minutes after the Phase B isolation signal (2.8 psig) is initiated, however all 3 lights on the handswitch will be lit, (not just the green and white.) Plausible because the start signal initiation is correct and white lights are used in other applications to identify abnormal plant conditions..*
- D. **CORRECT**, *The Containment Air Return Fans are to maintain air flow through the ice condenser by pulling air from upper containment and discharge into lower containment during the accident. The fans receive a start signal 10 minutes after the Phase B isolation signal (2.8 psig) is initiated. Overload protection for the fan motor is provided by an 'amptector" device and if it actuates all 3 lights on the handswitch will be lit.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 40

Tier 2 Group 1

K/A 025 A4.02

Ice Condenser System

Ability to manually operate and/or monitor in the control room:  
Containment vent fans

Importance Rating: 2.7 / 2.5

Technical Reference: 1,2-45N7791 R5  
1,2-45N779-5 R13  
1,2-47W611-30-3 R6

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.ICE b.4.f & .i  
Describe the following characteristics of each major component in the Ice Condenser system:  
f. Controls  
i. Protective Features

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #   X    
New \_\_\_\_\_

Question History: SQN bank question CTMT COMB GAS-B.12 003  
modified

Question Cognitive Level:

Memory or fundamental knowledge   X    
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 / 45.5 to 45.8 )

10CFR55.43.b ( n/a )

Comments: SQN bank question CTMT COMB GAS-B.12 003 modified

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

025 G 2.2.42 041

With Unit 1 in Mode 3, which ONE of the following conditions associated with the Ice Condenser System would cause a Technical Specification LCO to be entered?

- A. A floor drain isolation valve is determined to be open.
- B.  One pair of inlet doors is discovered to be pinned closed.
- C. The Ice Bed Temperature highest reading indicated 25°F.
- D. Chemical sample determined the average pH of the stored ice to be 9.3.

**DISTRACTOR ANALYSIS:**

- A. Incorrect, Floor drain isolation valves are required to be open. Plausible because the floor drains are required to be operable in Mode 3.*
- B. CORRECT, A pair of inlet doors pinned closed would make the doors inoperable and the doors are required to be operable in Mode 3.*
- C. Incorrect, the maximum Ice bed temperature is 27°F. Plausible because the maximum temperature limit is applicable in Mode 3.*
- D. Incorrect, the pH is required to be between 9.0 and 9.5. Plausible because the pH limit is applicable in Mode 3.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 41

Tier 2 Group 1

K/A 025 G 2.2.42

Ice Condenser System

Ability to recognize system parameters that are entry-level conditions for Technical Specifications.

Importance Rating: 3.9 / 4.6

Technical Reference: Technical Specifications, Amendment 322

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.ICE B.6.a

Describe the administrative controls and limits for the Ice Condenser System:

a. State the Tech Spec/TRM LCOs that govern the Ice Condenser

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New  \_\_\_\_\_

Question History: New Question

Question Cognitive Level:

Memory or fundamental knowledge  \_\_\_\_\_  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 / 41.10 / 43.2 / 43.3 / 45.3 )

10CFR55.43.b ( n/a )

Comments: New Question

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

026 K2.01 042

Given the following:

- Unit 1 was in Mode 1 with all Tech Spec equipment operable when a reactor trip/safety injection occurred.
- The following conditions are noted:

Time

0735	Reactor trip/safety injection
0738	Containment Pressure is 1.8 psig
0741	Containment Pressure is 2.9 psig
0746	Containment Pressure is 3.1 psig
0747	Offsite power supply to 6.9 Kv 1A-A S/D Bd is lost
0749	Containment Pressure is 2.9 psig

Which ONE of the following describes the status of the containment spray system at 0749?

- A. The Containment Spray Signal is actuated.  
1A-A Containment Spray Pump is running.
- B. The Containment Spray Signal is actuated.  
1A-A Containment Spray Pump is **NOT** running.
- C. The Containment Spray Signal is **NOT** actuated.  
1A-A Containment Spray Pump is running.
- D. The Containment Spray Signal is **NOT** actuated.  
1A-A Containment Spray Pump is **NOT** running.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, The containment spray signal would have been initiated prior to 0749 (when pressure exceeded 2.8 psid) and would have started the Containment spray pump but it would have been load shed when the board tripped and sequencer not timed out to restart the pump. Plausible if the correct time delays are not applied to the spray initiation signal and the pump sequencing back on.*
  
- B. **CORRECT**, *The containment spray signal would have been initiated prior to 0749 (when pressure exceeded 2.8 psid) when the shutdown board de-energized the breakers would strip, DG start and recover the board. Then the sequencer will prevent the CS pump from starting for 180 seconds after the board is energized.*
  
- C. *Incorrect, The containment spray signal would have been initiated prior to 0749 (when pressure exceeded 2.8 psid) and would have started the Containment Spray Pump but it would have been load shed when the board tripped and sequencer not timed out to restart the pump. Plausible if the correct time delays are not applied to the spray initiation signal and the pump sequencing back on.*
  
- D. *Incorrect, The containment spray signal would have been initiated prior to 0749 (when pressure exceeded 2.8 psid) and would have started the Containment Spray Pump but it would have been load shed when the board tripped and sequencer not timed out to restart the pump. Plausible if the correct time delays are not applied to the spray initiation signal and the pump sequencing back on.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 42

Tier 2 Group 1

K/A 026 K2.01  
Containment Spray System (CCS)  
Knowledge of bus power supplies to the following:  
Containment spray pumps

Importance Rating: 3.4\* / 3.6

Technical Reference: 1-47W611-72-1 R11  
TI-28 Attachment 9, 06-28-2007

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.CS B.4.b  
Describe the following items for each major  
component in the CS system as described in this  
lesson:  
b. Power supply (including control power as applicable)

Question Source:

Bank #  X   
Modified Bank #    
New

Question History: SQN bank question

Question Cognitive Level:

Memory or fundamental knowledge    
Comprehension or Analysis  X

10 CFR Part 55 Content: ( 41.7 )

10CFR55.43.b ( n/a )

Comments: SQN Audit 07 question with minor wording changes

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

026 K3.02 043

Given the following conditions:

- Unit 1 is operating at 100% power with Safety Injection Pump (SIP) 1A-A out of service when a LOCA occurs.
- When a safety injection is initiated, the 6.9kV Shutdown Board 1B-B trips due to relay actuation and is determined to be damaged.
- ES-1.3, "Transfer To RHR Containment Sump" has been completed.
- FR-Z.1, "High Containment Pressure" has been performed.
- 2 hours after the accident, the following conditions exist:
  - Containment Spray Pump 1A-A trips.
  - Containment pressure rises from 5.0 to 9.7 psig.

Which ONE of the following describes the proper action associated with RHR spray and the reason why?

Residual Heat Removal (RHR) spray would...

- A.  **NOT** be placed in service because neither SIP is running.
- B.  **NOT** be placed in service because only one CCP running.
- C.  be placed in service immediately due to the pressure in containment.
- D.  be placed in service after the minimum time since the accident elapses.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. *CORRECT, Requirements to place RHR spray in service include containment pressure greater than 9.5 psig spray flow at least 1 hour has elapsed since the start of the accident, and at least one CCP and one SI pump running. With SIP 1A-A out of service and the other shutdown board de-energized neither SIP is available to meet the required condition to place the RHR spray in service.*
- B. *Incorrect, the RHR spray would not be immediately placed in service but having only one CCP is not the reason. Plausible because with only one CCP pump it could be concluded that the only RHR pump should remain dedicated for core cooling (via supplying CCP suction) and not used for containment spray.*
- C. *Incorrect, the RHR spray would not be immediately placed in service even though both the minimum time and the containment pressure requirements have been met. Plausible because two of the three requirements are met and the applicant may not determine neither of the SIPs are available.*
- D. *Incorrect, the minimum time of 1 hour has been met,. So the establishing of RHR spray is not awaiting the time requirement to be met. Plausible because the applicant may apply the time to go to Hot Leg recirculation (5 hours) to the time requirement for RHR spray, as both are contained in ES-1.3.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 43

Tier 2 Group 1

K/A 026 K3.02

Knowledge of the effect that a loss or malfunction of the CSS will have on the following: Recirculation spray system.

Importance Rating: 4.2\* / 4.3

Technical Reference: ES-1.3, Transfer to RHR Containment Sump, Rev 16  
EPM-3-ES-1.3, Basis Document for ES-1.3 Transfer to  
RHR Containment Sump, Rev 9

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271ES-1.3 B.6.a  
Given a set of initial plant conditions use ES-1.3 to correctly:  
a. Identify required actions

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #  X   
New \_\_\_\_\_

Question History: SQN bank question CSS B.11.B 001 modified

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis  X

10 CFR Part 55 Content: ( 41.7 /45.6 )

10CFR55.43.b ( n/a )

Comments: SQN bank question CSS B.11.B 001 modified

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

039 A1.03 044

Given the following plant conditions:

- Unit 1 heatup in progress.
- Operators are warming the main steam lines using the MSIV bypasses.
- The OAC observes that the RCS has cooled down 96°F in the past hour.
- The CRO observes that the main steam lines have heated up 103°F in the past hour.

Which ONE of the following identifies the status of the RCS cooldown and Main Steam line heatup rate limits?

- A. RCS cooldown rate limit was **NOT** exceeded.  
Main Steam line heat-up rate limit was exceeded;
- B. RCS cooldown rate limit was exceeded;  
Main Steam line heat-up rate limit was **NOT** exceeded.
- C. **Both** RCS cooldown **and** Main Steam line heat-up rate limits were exceeded.
- D. ✓ **Neither** RCS cooldown **NOR** Main Steam line heatup rate limit was exceeded.

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, The main steam line heatup rate is within the rate limit. Plausible because the candidate could mistake the main steam heatup rate limit to be 100°F/hr.*
- B. *Incorrect, The RCS cooldown rate is within the rate limit. Plausible because the candidate could mistake the RCS cooldown rate limit to be the 75°F/hr RCS cooldown target value identified in GO-7.*
- C. *Incorrect, Both the RCS cooldown and the Main steam heatup rates are within the respective rate limit.*
- D. *Correct, Neither the RCS cooldown rate of 100°F/hr nor the Main steam heatup rate limit of 200°F/hr was exceeded.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 44

Tier 2 Group 1

K/A 039 A1.03

Main and Reheat Steam System:

Ability to predict and or monitor changes in parameters to prevent exceeding design limits associated with operating the MRSS controls including:

Primary system temperature indications and required values, during main steam system warm-up.

Importance Rating: 2.6 / 2.7

Technical Reference: Unit 1 Technical Specification 3.4.9.1, Amendment 297 Pressure Temperature Limits Report (PTLR), Rev 4 1-SO-1-1, Main Steam System, Rev 25 Precaution D.

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.MS B.5.a & .b  
Describe the operation of the Main Steam system as it pertains to the following:  
a. Precautions and Limitations  
b. Major steps performed while placing the Main Steam in service  
OPT200.RCS B.6.a  
Describe the administrative controls and limits for the RCS as explained in this lesson:  
a. State Tech Specs/TRM LCOs that govern the RCS

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #  X  \_\_\_\_\_  
New \_\_\_\_\_

Question History: SQN bank question 039 A1.03 043 modified

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis  X  \_\_\_\_\_

10 CFR Part 55 Content: ( 41.5 / 45.5 )

10CFR55.43.b ( n/a )

Comments: SQN Audit exam 12/07

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

059 K4.02 045

Given the following

- Unit 1 is at 100% RTP.
- Main Feed Pump Turbine 1A trips.

Which ONE of the following describes the EHC indicating light that will be LIT during the automatic plant response to this condition?

(Assume no operator action taken)

- A. The VALVE POS LIMIT light lit and plant power reduces to ~72%.
- B. The VALVE POS LIMIT light lit and plant power reduces to ~76%.
- C. The RUNBACK OPER light lit and plant power level reduces to ~72%.
- D. The RUNBACK OPER light lit and plant power level reduces to ~76%.

DISTRACTOR ANALYSIS:

- A. *CORRECT, If a main feed pump turbine trips with the plant above 76% power a turbine runback occurs through the valve position limiter (VPL). This causes the VALVE POS LIMIT light on the EHC panel to be lit. The VPL drives the turbine governor valves a 72% or less power equivalent power on the loss of the MFP.*
- B. *Incorrect, The VPL light is lit during the runback but the runback is not to 76% power, it is to 72% power. Plausible because 76% is the unit power required to arm the runback circuit to allow the runback.*
- C. *Incorrect, The RUNBACK OPER light is not lit during a runback due to a MFPT trip. It is lit during a primary runback (OTdeltaT or OPdeltaT), the MFPT trip runback is a secondary runback and the runback is via the VPL. Plausible because the RUNBACK OPER light is lit during primary runbacks and because the 72% is the value where the plant is runback due to a MFPT tripping if load is above 76% when the trip occurs.*
- D. *Incorrect, The RUNBACK OPER light is not lit during a runback due to a MFPT trip. It is lit during a primary runback (OTdeltaT or OPdeltaT), the MFPT trip runback is a secondary runback and the runback is via the VPL. Plausible because the RUNBACK OPER light is lit during primary runbacks and because the 76% is the unit power required to arm the runback circuit to allow the runback.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 45

Tier 2 Group 1

K/A 059 K4.02

Main Feedwater (MFW) System

Knowledge of MFW design feature(s) and/or interlock(s) which provide for the following:

Automatic turbine/reactor trip runback

Importance Rating: 3.3 / 3.5

Technical Reference: AOP-S.01, Loss of Normal Feedwater, Rev. 14

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.MTGC; B. 4.e & .h  
Describe the following characteristics of each major component in the Main Turbine-Generator Control System.  
e. Component Operation  
h. Instrumentation and Indications

Question Source:

Bank #   X    
Modified Bank #             
New           

Question History: SQN bank question MGTC-B.5.D 001 with minor changes

Question Cognitive Level:

Memory or fundamental knowledge             
Comprehension or Analysis   X  

10 CFR Part 55 Content: ( 41.7 )

10CFR55.43.b ( n/a )

Comments: SQN bank question MGTC-B.5.D 001 with minor changes  
Correct answer relocated, Wording in stem and choices changed

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

061 A3.03 046

Given the following:

- Unit 1 was operating at 25% power.
- A #2 S/G low-low level reactor trip occurred due to a feedwater reg valve problem.
- Following the trip,  $T_{avg}$  dropped to 542°F.
- The crew enters ES-0.1, "Reactor Trip Response."

Assuming NO action has been taken by the crew, which ONE of the following describes the status of the AFW system after the steam generator levels return to the programmed level setpoint ?

MD AFW Pumps  
running with...

TD AFW Pump...

- |  |                                     |
|--|-------------------------------------|
| A. LCVs full open.   | running with LCVs full open.        |
| B. LCVs full open.   | <b>NOT</b> running and LCVs closed. |
| <input checked="" type="checkbox"/> C. LCVs throttling in response to steam generator level. | running with LCVs full open.        |
| D. LCVs throttling in response to steam generator level.                                     | <b>NOT</b> running and LCVs closed. |

## QUESTIONS REPORT

for 2009 RO Retake Exam Questions

### DISTRACTOR ANALYSIS:

*MD AFW LCVs control SG level at 33%. When above setpoint, valves will be throttling closed to control level. The TD AFW LCVs will get signal to come full open when the pump receives an accident start signal.*

- A. Incorrect, the TD AFW LCVs will be full open, but with the SG levels above setpoint the MD LCVs will be throttling. Plausible because all of the AFW pumps are running and all LCVs would have been full open until the levels begins to recover, allowing the MD AFW LCV to start throttling.*
- B. Incorrect, the TD AFW LCVs will not be full closed and with the SG levels above setpoint, the MD LCVs will be throttling. Plausible because initially one SG level being low would start the MDAFW pumps but not the TDAFW pump. However, following the trip with  $T_{avg}$  dropping below  $550^{\circ}\text{F}$ , a feedwater isolation occurs, both MFWPTs trip resulting in a TDAFW pump start and LCV open signal.*
- C. CORRECT, With the SG levels above setpoint the MD LCVs will be throttling and the TD AFW LCVs will come full open when the TD AFW pump receives a starts(due to the trip of both MFWPT because the reactor is tripped coincident with  $T_{avg} < 550^{\circ}\text{F}$ ) and will remain full open.*
- D. Incorrect, With the SG levels above setpoint the MD LCVs will be throttling but the TD AFW LCVs will not be full closed. Plausible because with the levels recovered the MDAFW valves would be throttling and initially one SG level being low would start the MDAFW pumps but not the TDAFW pump. However, following the trip with  $T_{avg}$  dropping below  $550^{\circ}\text{F}$ , a feedwater isolation occurs, both MFWPTs trip resulting in a TDAFW pump start and LCV open signal.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 46

Tier 2 Group 1

K/A 061 A3.03

Ability to monitor automatic operation of the AFW, including:  
AFW S/G level control on automatic start

Importance Rating: 3.9 / 3.9

Technical Reference: 1,2-47W611-3-3, R29  
1,2-47W611-3-4, R20  
1-47W611-99-7, R3  
TI-28, Curve Book , Attachment 9, 6/28/07

Proposed references to be provided to applicants during examination:  
None

Learning Objective: OPT200.AFW B.4.e, .f, & .l  
Describe the following characteristics of each major component in the AFW system:  
e. Component Operation  
f. Controls  
l. Types of accidents for which the AFW components are designed

Question Source:

Bank #   X    
Modified Bank #             
New           

Question History: SQN Bank question 061 A3.03 001 written for 2007 audit exam

Question Cognitive Level:

Memory or fundamental knowledge             
Comprehension or Analysis   X  

10 CFR Part 55 Content: ( 41.7 / 45.5 )

10CFR55.43.b ( n/a )

Comments: Bank question reformatted, Stem conditions changed to added plausibility to distracters, but answer remained to same.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

061 K6.02 047

Given the following:

- Unit 1 tripped from 100% power.
- TDAFW pump is tagged.
- 1B-B AFW pump failed to start.

Which ONE of the following identifies the steam generators (S/G's) that would be supplied by AFW and which steam generators still have blowdown flow aligned?

	<u>AFW flow to S/G's</u>	<u>Blowdown flow aligned to S/G's</u>
A.	1 & 2	All 4
B.✓	1 & 2	1 & 3
C.	1 & 3	All 4
D.	1 & 3	1 & 3

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, AFW flow will be aligned to 1 & 2 as 1A-A MDAFW pump supplies 1 & 2 S/G's, since this first half of the distracter is correct it makes this choice plausible. The second half of this choice is incorrect as the start of the 1A-A MDAFW pump only isolates blowdown flow to 2 & 4 S/G's. It is plausible if the student cannot remember it blowdown outside isolation valves 1 & 3 are the only affected valves on a 1A-A MDAFW pump start with no phase A isolation.*
- B. *CORRECT, AFW flow will be aligned to 1 & 2 as 1A-A MDAFW pump supplies 1 & 2 S/G's and blowdown will isolate to S/G's 2 & 4 with the pump start leaving SGBD aligned to S/G's 1 & 3.*
- C. *Incorrect, AFW flow will be aligned to 1 & 2 ( verses 1 & 3) as 1A-A MDAFW pump supplies 1 & 2 S/G's, S/G's 1 & 3 are plausible as some 'A' train components are designed as 1 & 3 and student will have to remember which specific S/G's are fed by the 1A-A AFW pump start. The second half of this choice is incorrect as the start of the 1A-A MDAFW pump only isolates blowdown flow to 2 & 4 S/G's. It is plausible if the student cannot remember it blowdown outside isolation valves 1 & 3 are the only affected valves on a 1A-A MDAFW pump start with no phase A isolation.*
- D. *Incorrect, AFW flow will be aligned to 1 & 2 ( verses 1 & 3) as 1A-A MDAFW pump supplies 1 & 2 S/G's, S/G's 1 & 3 are plausible as some 'A' train components are designed as 1 & 3 and student will have to remember which specific S/G's are fed by the 1A-A AFW pump start. The second half of this choice is correct and helps making this choice plausible.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 47

Tier 2 Group 1

K/A 061 K6.02

Auxiliary Feedwater System

Knowledge of the effect of a loss or malfunction of the following will have on the AFW components: Pumps

Importance Rating: 2.6 / 2.7

Technical Reference: 1,2-47W803-2 Flow Diagram Auxiliary Feedwater  
1,2-45N601-3, Main Steam System Schematic

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.AFW B.5.d  
Describe the operation of the AFW system  
How a component failure will affect system operation

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New   X  

Question History:   New  

Question Cognitive Level:

Memory or fundamental knowledge   X    
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: (41.7 / 45.7)

10CFR55.43.b ( n/a )

Comments:

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

062 K2.01 048

Given the following:

- Both Units operating at 100% RTP when a loss of offsite power occurs.
- All systems respond as designed.

Which ONE of the following identifies the Control and Station Air Compressors that can be placed in service prior to an offsite power supply being restored?

- A. Only A and B compressors
- B. Only A and D compressors
- C. Only B and C compressors
- D. Only C and D compressors

**DISTRACTOR ANALYSIS:**

- A. *CORRECT, Control Air Compressors A and B both feed from Unit 1 480v Shutdown Boards which would be receiving EDG power during the loss of offsite power.*
- B. *Incorrect, Control Air Compressor A would have an available power supply but the D air compressor feeds from the 480v Turbine Building common board which would not have power until offsite power was restored. Plausible because only 2 of the 4 air compressors would have an available power source and the applicant must recall which 2 are correct.*
- C. *Incorrect, Control Air Compressors B would have an available power supply but the C air compressor feeds from the 480v Turbine Building common board which would not have power until offsite power was restored. Plausible because only 2 of the 4 air compressors would have an available power source and the applicant must recall which 2 are correct.*
- D. *Incorrect, Control Air Compressors C and D both feed from the 480v Turbine Building Common Board which would not have power until offsite power was restored. Plausible because only 2 of the 4 air compressors would have an available power source and the applicant must recall which 2 are correct.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 48

Tier 2 Group 1

K/A 062 K2.01  
A.C. Electrical Distribution  
Knowledge of bus power supplies to the following:  
Major system loads

Importance Rating: 3.3 / 3.4

Technical Reference: AOP-P.01, Loss of Offsite Power, Rev 23  
0-SO-32-1 Att 1, Control Air System Power Checklist  
0-32-1.01, 6/26/2007

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.CSA B.4.b  
Describe the following items for each major component  
in the CSA:  
b. Power supply (include control power as applicable)

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New  X  \_\_\_\_\_

Question History: New Question

Question Cognitive Level:

Memory or fundamental knowledge  X  \_\_\_\_\_  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 )

10CFR55.43.b ( n/a )

Comments:

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

063 A4.02 049

An equalizing charge has been started on the 250V DC Battery #1 in accordance with 0-PI-EBM-000-001.1, "Battery Equalize Charge."

Which ONE of the following is the expected voltage ("250V Battery Volts") and current response ("250V Battery Amps") on 1-M-1?

	<u>250V Battery Volts</u>	<u>250V Battery Amps</u>
A.	higher than before start of charge	would be indicating upscale from zero
B✓	higher than before start of charge	would be indicating downscale from zero
C.	the same as before start of charge	would be indicating upscale from zero
D.	the same as before start of charge	would be indicating downscale from zero

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, for an equalizing charge the battery terminal voltage is raised to drive electrolytic components plated out on the plates back into solution. Current will respond by flowing into the battery and is reflected by indicating downscale on the board amp meter. The first part of the distracter is plausible as it is correct. The second part is plausible as the examinee will need to reason which way current indicates if it is going into/out of the battery.*
- B. *CORRECT, for an equalizing charge the battery terminal voltage is raised to drive electrolytic components plated out on the plates back into solution. Current will respond by flowing into the battery and is reflected by indicating downscale on the board amp meter.*
- C. *Incorrect, for an equalizing charge the battery terminal voltage is raised to drive electrolytic components plated out on the plates back into solution. Current will respond by flowing into the battery and is reflected by indicating downscale on the board amp meter. The first part of the distracter is plausible as the examinee will need to reason out that an equalizing charge noticeably raises battery terminal voltage above "normal" standby voltage or remember from experience. The second part is plausible as the examinee will need to reason which way current indicates if it is going into/out of the battery.*
- D. *Incorrect, for an equalizing charge the battery terminal voltage is raised to drive electrolytic components plated out on the plates back into solution. Current will respond by flowing into the battery and is reflected by indicating downscale on the board amp meter. The first part of the distracter is plausible as the examinee will need to reason out that an equalizing charge noticeably raises battery terminal voltage above "normal" standby voltage or remember from experience. The second part is plausible as it is correct.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 49

Tier 2 Group 1

K/A 063 A4.02

Ability to manually operate and/or monitor in the control room:  
Battery voltage indicator

Importance Rating: 2.8 / 2.9

Technical Reference: 0-SO-250-5, 250 Volt DC Power System, Rev 26

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271.200 B.4.d, .e, .h  
Describe the following characteristics of each major component in the DC electrical systems: Normal operating parameters, component operation, instrumentation and indications.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #  X  \_\_\_\_\_  
New \_\_\_\_\_

Question History: SQN question 063 A4.01 048 modified

Question Cognitive Level:

Memory or fundamental knowledge  X   
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 / 45.5 to 45.8 )

10CFR55.43.b ( n/a )

Comments: Modified question by changing stem to have an equalizing battery charge in progress and added the voltmeter component to stem, answer and distracters.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

064 K4.03 050

Given the following:

- Shutdown board 1A-A is being supplied by DG 1A-A following a blackout signal.
- An operating crew is in the process of implementing EA-202-1, "Restoring Off-Site Power to 6900V Shutdown Boards," for shutdown board 1A-A.
- Black-out Relays have been reset and the 6.9kV Unit Board 1B synchronize switch to SYN position.
- The synchroscope is rotating fast in the FAST direction.

Which ONE of the following identifies...

- (1) the direction the speed control switch will initially have to be manipulated to establish conditions for closing Shutdown Board 1A-A NOR supply breaker, and
- (2) the mode of speed control after the SD Bd 1A-A NOR supply breaker is closed in parallel with the diesel?

A✓ (1) lower  
(2) speed droop

B. (1) lower  
(2) without speed droop

C. (1) raise  
(2) speed droop

D. (1) raise  
(2) without speed droop

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. **CORRECT**, Even though the grid would appear to be the incoming and the DG the running component, the DG is always incoming and therefore the DG will need its speed lowered by going to lower on the speed control switch to achieve slow in the FAST direction and after the breaker is closed the mode of speed control would be speed droop.
- B. **Incorrect**, the DG will need its speed lowered by going to lower on the speed control switch to achieve slow in the FAST direction but after the breaker is closed the mode of speed control would not be without speed droop (isochronous.) It would be in speed droop. Plausible because the system would appear to be the incoming and the mode of speed control would be without speed droop (isochronous) prior to closing the breaker.
- C. **Incorrect**, the DG will need its speed lowered (not raised) by going to lower on the speed control switch to achieve slow in the FAST direction but after the breaker is closed the mode of speed control would be speed droop. Plausible because the system would appear to be the incoming and the mode of speed control is correct.
- D. **Incorrect**, the DG will need its speed lowered (not raised) by going to lower on the speed control switch to achieve slow in the FAST direction and after the breaker is closed the mode of speed control would not be without speed droop (isochronous.) It would be speed droop. Plausible because the system would appear to be the incoming and the mode of speed control would be without speed droop (isochronous) prior to closing the breaker.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 50

Tier 2 Group 1

K/A 064 K4.03

Knowledge of ED/G system design feature(s) and/or interlock(s) which provide the following: Governor valve operation

Importance Rating: 2.5 / 3.0

Technical Reference: EA-202-1, Restoring Off-Site Power to 6900V Shutdown Boards, Rev. 9  
1-45N767-4, Wiring diagrams 6900V Diesel Generators, R21

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.DG B.4.f  
Describe the following items for each major component in the Diesel Generator System: Controls

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #  X  \_\_\_\_\_  
New \_\_\_\_\_

Question History: Modified Sequoyah exam bank question D/G-B.9 002

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis  X  \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 )

10CFR55.43.b ( n/a )

Comments: Changed stem initial conditions to have the DG parallel to the grid as "incoming". Added required knowledge of droop/isochronous to tie to design feature of diesel in how GVs are controlled in various modes. Rewrote answer and distracters to reflect additional knowledge requirement. Relocated correct answer.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

073 A2.01 051

Given the following:

- Unit 1 is at 100% RTP.
- Alarm "0-RA-90-212B STA SUMP DISCH INSTR MALFUNC" annunciates.

In accordance with the Annunciator Response, which ONE of the following is a condition that would cause the alarm and mitigating action required?

**Cause**

**Mitigating Action**

- |  |   |
|--|---|
| A✓ Loss of power to the radiation monitor  | Release can continue, but ODCM actions for sampling must be implemented.                                      |
| B. Loss of power to the radiation monitor  | Release will automatically terminate, and cannot be restated until ODCM actions for sampling are implemented. |
| C. High flow through the radiation monitor | Release can continue, but ODCM actions for sampling must be implemented.                                      |
| D. High flow through the radiation monitor | Release will automatically terminate, and cannot be restated until ODCM actions for sampling are implemented. |

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. CORRECT, Loss of power to the monitor will cause the instrument malfunction alarm and the release could continue with sampling performed as required by the ODCM.**
- B. Incorrect, A loss of power to the monitor would cause the malfunction alarm but the release is not automatically terminated by an instrument malfunction. Plausible because loss of power causing an instrument malfunction alarm is correct and some radiation releases do automatically terminate on instrument malfunctions.**
- C. Incorrect, A low flow through the monitor would cause the malfunction alarm but not a high flow but the release can continue provided ODCM required actions are implemented. Plausible because flow does cause a instrument malfunction alarm but it is low flow not high flow and the release continuing with sampling performed as required by the ODCM is correct.**
- D. Incorrect, A low flow through the monitor would cause the malfunction alarm but not a high flow and the release is not automatically terminated by an instrument malfunction. Plausible because flow does cause an instrument malfunction alarm but it is low flow not high flow and some radiation releases do automatically terminate on instrument malfunctions.**

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 51

Tier 2 Group 1

K/A 073 A2.01

Process Radiation Monitoring (PRM) System

Ability to (a) predict the impacts of the following malfunctions or operations on the PRM system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:

Erratic or failed power supply

Importance Rating: 2.5 / 2.9\*

Technical Reference: 0-AR-M12A, Unit 1 and Common Radiation Monitor  
0-XA-55-12A, Rev 5  
SQN ODCM, Offsite Dose Calculation Manual, Rev 55

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.RM B.5.c  
Describe the operation of the Radiation Monitoring System:  
c. Alarms and alarm response

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #   X    
New \_\_\_\_\_

Question History: SQN bank question 073 A2.01 001 modified

Question Cognitive Level:

Memory or fundamental knowledge   X    
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: ( 41.5 / 43.5 / 45.3 / 45.13 )

10CFR55.43.b ( n/a )

Comments: SQN bank question 073 A2.01 001 modified.

Relocated correct answer,

Changed Rad Monitor in the stem to a monitor not having an automatic isolation.

Change the Mitigating Actions in the correct answer and each of the distracters.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

076 K3.02 052

Given the following plant conditions:

- Unit #1 is operating at 100%.
- All systems aligned normal.
- Loss of ERCW Supply header 2A occurs due to a rupture in the yard.

Which ONE of the following conditions would result from the loss of the ERCW Supply Header 2A? (Assume no operator actions).

- A. Loss of cooling to Main Control Room Chiller A.
- B. Loss of cooling to Shutdown Board Room Chiller A.
- C. Increasing temperature on Control and Station Air Compressors.
- D✓ Increasing level in Component Cooling Water (CCS) surge tank.

**DISTRACTOR ANALYSIS:**

- A. Incorrect, Main Control Room Chiller A is supplied from ERCW Header 1A and would not be affected. Plausible because if the 1A header had been lost the Chiller cooling would have been affected.*
- B. Incorrect, Shutdown Board Room Chiller A is supplied from ERCW Header 1A and would not be affected. Plausible because if the 1A header had been lost the Chiller cooling would have been affected.*
- C. Incorrect, Control and Station Air compressor cooling was changed from ERCW to RCW during a plant modification in 2008 and would not be affected. Plausible because the cooling for the air compressors previously was from ERCW.*
- D. CORRECT, ERCW header 2A supplies the cooling water to the 'A' CCS heat exchanger which cools Unit 1 CCS Train A. the loss of cooling to the 'A' CCS heat exchanger would cause a heatup of Unit 1 'A' CCS train and expansion into the surge tank.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 52

Tier 2 Group 1

K/A 076 K3.02

Service Water System (SWS)

Knowledge of the effect that a loss or malfunction of the SWS will have on the following:

Secondary closed cooling water

Importance Rating: 2.5\* / 2.8\*

Technical Reference: AOP-M.01, Loss of Essential Raw Cooling Water,  
Rev 20

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.CCS B.5.e

Describe the operation of the Component Cooling Water System:

e. How a support system failure will effect Component Cooling Water System operation.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # X \_\_\_\_\_  
New \_\_\_\_\_

Question History: SQN bank question CCS-B.9.A 002 modified

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis X \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 / 45.6 )

10CFR55.43.b ( n/a )

Comments: SQN bank question CCS-B.9.A 002 modified,  
Relocated correct answer,  
Modified all distracters and reworded correct answer,  
Minor wording changes in question stem

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

076 K4.03 053

Given the following plant conditions and information:

- Unit 1 was operating at 100% power.
- Both of the following valves are in the full open position.
  - 1-FCV-67-146, "CCS HX 1A1 & 1A2 Outlet to Disch Hdr B."
  - 0-FCV-67-152, "CCS HX 0B1 & 0B2 Outlet to Disch Hdr B."

Which ONE of the following identifies how the position of the listed CCS heat exchanger ERCW outlet valves will be affected by a Unit 1 Safety Injection signal?

0-FCV-67-152...

1-FCV-67-146...

- |                                       |                                    |
|---------------------------------------|------------------------------------|
| A. remains in full open position.     | remains in full open position.     |
| B. remains in full open position.     | is positioned to the 35% position. |
| C✓ is positioned to the 35% position. | remains in full open position.     |
| D. is positioned to the 35% position. | is positioned to the 35% position. |

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, 0-FCV-67-152 automatically goes to the 35% open position for an SI signal on either unit. This ensures adequate flow and CCS system backpressure for the B train ESF equipment for the accident unit. 1-FCV-67-146 remains in it's current position until manually realigned as directed by EA-67-1.*
- B. *Incorrect, 0-FCV-67-152 automatically goes to the 35% open position for an SI signal on either unit. This ensures adequate flow and CCS system backpressure for the B train ESF equipment for the accident unit. 1-FCV-67-146 remains in it's current position until manually realigned as directed by EA-67-1.*
- C. *Incorrect, 0-FCV-67-152 automatically goes to the 35% open position for an SI signal on either unit. This ensures adequate flow and CCS system backpressure for the B train ESF equipment for the accident unit. 1-FCV-67-146 remains in it's current position until manually realigned as directed by EA-67-1. Each of these valves may be positioned manually from 0-M-27 to closed, 35% open, 50% open and 100% open. Full open is the preferred position in accordance with 0-SO-67-1.*
- D. *Incorrect, 0-FCV-67-152 automatically goes to the 35% open position for an SI signal on either unit. This ensures adequate flow and CCS system backpressure for the B train ESF equipment for the accident unit. 1-FCV-67-146 remains in it's current position until manually realigned as directed by EA-67-1.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 53

Tier 2 Group 1

K/A 076 K4.03

Service Water System (SWS)

Knowledge of SWS design feature(s) and/or interlock(s) which provide for the following:

Automatic opening features associated with SWS isolation valves to CCW heat exchanges

Importance Rating: 2.9\* / 3.4\*

Technical Reference: 0-SO-67-1, Essential Raw Cooling Water, Rev 80  
1,2-47W611-99-3 R11  
1,2-47W611-67-5 R35

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.ERCW, B.4.d, .e, & .f  
Describe the following characteristics of each major component in the ERCW system:  
d. Normal operating parameters  
e. Component operation  
f. Controls

Question Source:

Bank #   X    
Modified Bank #             
New           

Question History: SQN question ERCW-B-9.E 003

Question Cognitive Level:

Memory or fundamental knowledge             
Comprehension or Analysis   X  

10 CFR Part 55 Content: ( 41/7 )

10CFR55.43.b ( n/a )

Comments: SQN Bank question with wording/format changes.  
Relocated correct answer

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

078 G2.2.38 054

Given the following:

- Both Units operating at 100% power.
- A problem with the control air system results in decreasing pressure on Train A essential air header.

Which ONE of the following identifies the decreasing air pressure on the Train A header where equipment supported by Aux Air would be considered to be INOPERABLE?

- A. 78 psig
- B. 74 psig
- C. 70 psig
- D. 66 psig

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, 70 psig not 78 psig is the pressure where equipment supported by aux air is to be considered inoperable. Plausible because 78 psig is below the pressure where the Aux air compressors auto load if running.*
- B. *Incorrect, 70 psig not 74 psig is the pressure where equipment supported by aux air is to be considered inoperable. Plausible because 74 psig is below the pressure where the Aux air compressors auto start.*
- C. **CORRECT**, *aux air pressure of 70 psig is identified in the Annunciator Response Procedures and in AOP-M.02 as the pressure where equipment supported by aux air is to be considered inoperable.*
- D. *Incorrect, 70 psig not 66 psig is the pressure where equipment supported by aux air is to be considered inoperable. Plausible because 66 psig is below the pressure where the Aux air auto isolates from control air.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 54

Tier 2 Group 1

K/A 078 G2.2.38  
Instrument Air System (IAS)  
Knowledge of conditions and limitations in the facility license.

Importance Rating: 3.6 / 4.5

Technical Reference: 1-AR-M15-B, Miscellaneous 1-XA-55-15-B, Rev. 27  
AOP-M.02, Loss of Control Air, Rev. 14

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.CSA B.6.a  
Describe the administrative controls and limits for the  
CSA:  
a. State Tech Spec/TRM LCOs that govern the CSA.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New  X

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge  X   
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 / 41.10 / 43.1 / 45.13 )

10CFR55.43.b ( n/a )

Comments:

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

103 K1.03 055

Which ONE of the following identifies two ventilation system fans that can exhaust out one of the Shield Building Exhaust Vents?

- A. EGTS Fans and Annulus Vacuum Control Fans
- B. EGTS Fans and Containment Purge Exhaust Fans**
- C. Fuel Handling Exhaust Fans and Annulus Vacuum Control Fans
- D. Fuel Handling Exhaust Fans and Containment Purge Exhaust Fans

**DISTRACTOR ANALYSIS:**

- A. Incorrect, EGTS Fans can exhaust out the Shield Building Exhaust Vents but Annulus Vacuum Control Fans exhaust out the Auxiliary Building Vent. Plausible because the EGTS Fans can exhaust out the Shield Building Exhaust Vents is correct and the annulus vacuum fans perform the same function of maintaining differential pressure between the containment and the annulus, only they run during normal operation and are isolated when the EGTS cleanup fans start.*
- B. CORRECT, the EGTS Fans and Containment Purge Exhaust Fans can exhaust out the Shield Building Exhaust Vents. The Containment Purge Exhaust Fans only exhaust through the Shield Building Exhaust Vent for the applicable unit. The EGTS Fans discharge to a Shield Building Exhaust Vent or recirculation back to the containment annulus depending on differential pressure.*
- C. Incorrect, Both the Fuel Handling Exhaust Fans and Annulus Vacuum Control Fans exhaust out the Auxiliary Building Vent. Plausible because the Fuel Handling Exhaust Fans are moving air that has the potential to have radioactivity and the annulus vacuum fans perform the same function of maintaining differential pressure between the containment and the annulus, only they run during normal operation and are isolated when the EGTS cleanup fans start.*
- D. Incorrect, Fuel Handling Exhaust Fans exhaust out the Auxiliary Building Vent (not the shield building vent) but Containment Purge Exhaust Fans do exhaust out the Shield Building Exhaust Vents. Plausible because the Fuel Handling Exhaust Fans are moving air that has the potential to have radioactivity and the Containment Purge Exhaust Fans exhausting out the Shield Building Exhaust Vents is correct.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 55

Tier 2 Group 1

K/A 103 K1.03

Containment System

Knowledge of the physical connections and/or cause effect relationships between the containment system and the following systems:

Shield building vent system

Importance Rating: 3.1\* / 3.5\*

Technical Reference: 1-47W866-1 R38

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.CONTPURGE B.3

Explain the purpose/function of each major component in the flow path of the containment purge system as illustrated on a simplified system drawing.

OPT200.EGTS B.3

Explain the purpose/function of each major component in the flow path of the EGTS as illustrated on a simplified system drawing.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New  \_\_\_\_\_

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge  \_\_\_\_\_  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: ( 41.2 to 41.9 / 45.7 to 45.8 )

10CFR55.43.b ( n/a )

Comments: New question

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

011 A1.03 056

Given the following:

- Unit 2 is at 100% power.
- All systems are normally aligned.
- 2-XS-68-330E, "Level Control Channel Selector" is in the LT-68-339 & 335 position.
- VCT level is at 38%
- Pressurizer level transmitter 2-LT-68-339 loses the level in its reference leg.
- **No** ESF actuations occur as a result of the reference leg leak.

If the operating crew takes no action, which ONE of the following describes how the VCT level will respond throughout the event?

The VCT level will...

- A. rise and be maintained between 63% and 93%.
- B. drop, then be maintained between 20% and 41%.
- C. rise to between 63% and 93%, then drop and be maintained between 20% and 41%.
- D. drop to 7%, cause charging pump suction to transfer to the RWST, and remain low.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, VCT level will rise and start to divert as level reaches 63%, but with the pressurizer level dropping letdown will isolate. This causes the VCT to start dropping the divert valve to close. Plausible because the VCT level rising and causing the divert valve to open is correct but due to the isolation of letdown the level will not be maintained in the divert valve range.*
- B. *Incorrect, VCT level will rise, not drop. Plausible because the effect on the level transmitter due to the loss of the reference leg could be reversed, making the pressurizer level indicate low and increasing charging flow which would cause VCT level to drop. The automatic makeup would then maintain VCT level between 20-41%.*
- C. **CORRECT**, *Loss of the reference leg will cause the level transmitter to indicate high. This transmitter is the controlling level transmitter, thus charging will decrease to minimum. Letdown remaining the same will cause the VCT level to rise and be controlled between 63-93% by the divert valve. With reduced charging, the pressurizer level will decrease until letdown isolates causing the VCT level to start dropping. The VCT level will then be controlled by auto makeup between 20-41% band.*
- D. *Incorrect, VCT level will rise, not drop. Plausible because the effect on the level transmitter due to the loss of the reference leg could be reversed, making pressurizer level indicate low and increasing charging flow which would cause VCT level to drop. 7% is plausible because 7% is the setpoint where the charging pump suction is swapped to the RWST.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 56

Tier 2 Group 2

K/A 011 A1.03

Pressurizer Level Control System (PZR LCS)

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PZR LCS controls including:  
VCT level

Importance Rating: 3.1 / 3.3

Technical Reference: AOP-1.04, Pressurizer Instrument and Control Malfunctions, Rev 9

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200PZRLCS B.5.f  
Describe the operation of the Pressurizer Level Control System as it relates to the following:  
f. How a instrument failure will affect system operation

Question Source:

Bank #   X    
Modified Bank #             
New           

Question History: Braidwood question 011000A1.03

Question Cognitive Level:

Memory or fundamental knowledge             
Comprehension or Analysis   X  

10 CFR Part 55 Content: ( 41.5 / 45.5 )

10CFR55.43.b ( n/a )

Comments: Braidwood 2006 exam

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

015 K2.01 057

Given the following:

- Unit 1 startup in progress.
- Reactor is critical in the source range.
- Intermediate Range monitors read  $2 \times 10^{-5}\%$  power.
- 120VAC Vital Instrument Power Board 1-II is deenergized.

Which ONE of the following describes effects associated with the loss of the instrument power board?

- A. Reactor remains critical - Only one SRM is energized.
- B. Reactor remains critical - Both SRMs remain energized.
- C.  Reactor trips - Only one SRM is energized.
- D. Reactor trips - Both SRMs remain energized.

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, Only one SRM would be energized but the reactor would trip due to NI-32 failure. Plausible because if the failure had been a different Instrument Power Board, the reactor could have remained critical and the failure would have been different on the SRMs.*
- B. *Incorrect, The reactor would trip due to NI-32 failure and only one source range monitor would be energized. Plausible because if the failure had been a different Instrument Power Board, the reactor could have remained critical and the failure would have been different on the SRMs.*
- C. **CORRECT**, *NI-32 and NI-36 would fail causing bistables to trip. Failure of either one of these instruments would cause a reactor trip with the reactor power was stated in the question and with NI-32 failed, only SR instrument NI-31 would be energized*
- D. *Incorrect, The reactor tripping is correct but due to NI-32 losing power but only one source range monitor would be energized. Plausible because the failure does result in the reactor tripping and the failure would have been different on the SRMs.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 57

Tier 2 Group 2

K/A 015 K2.01  
Nuclear Instrumentation System  
Knowledge of bus power supplies to the following:  
NIS channels, components, and interconnections

Importance Rating: 3.3 / 3.7

Technical Reference: AOP-I.01, Nuclear Instrument Malfunction, Rev. 9

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.NIS B.4.b, .i & .j  
Describe the following characteristics of each major component in the NIS system:  
b. Power Supply  
i. Protective Features  
j. Failure modes

Question Source:

Bank #   X    
Modified Bank #             
New           

Question History: Cook Exam Bank 2004

Question Cognitive Level:

Memory or fundamental knowledge             
Comprehension or Analysis   X  

10 CFR Part 55 Content: ( 41.7 )

10CFR55.43.b ( n/a )

Comments:

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

028 K3.01 058

Given the following:

- Unit 1 operating at 100% RTP when a large break LOCA occurs.
- Offsite power is lost following the accident and Diesel Generator 1B-B fails to start.
- While performing FR-Z.1, "High Containment Pressure", the crew places Hydrogen Recombiner "A" in service and the recombiner stabilizes at an operating temperature of 700°F.
- When Train B shutdown boards are restored, the containment hydrogen concentration is 1.2%

Which ONE of the following identifies the status of Hydrogen Recombiner A and the correct action relative to placing Hydrogen Recombiner B in service?

Hydrogen Recombiner A  
operating temperature is...

Hydrogen Recombiner B  
can be placed in service...

A. ✓ below the range  
to cause oxygen &  
hydrogen recombination.

with the current conditions.

B. below the range  
to cause oxygen &  
hydrogen recombination.

ONLY if containment hydrogen  
concentration is reduced to <0.5%

C. within the range  
to cause oxygen &  
hydrogen recombination.

with the current conditions.

D. within the range  
to cause oxygen &  
hydrogen recombination.

ONLY if containment hydrogen  
concentration is reduced to <0.5%

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. **CORRECT**, Recombiner 'A' is operating below the 1150°F to 1400°F range where the recombination of hydrogen and oxygen occur and Recombiner 'B' can be placed in service with the current hydrogen concentration.
- B. **Incorrect**, Recombiner 'A' is operating below the 1150°F to 1400°F range where the recombination of hydrogen and oxygen occur but Recombiner 'B' can be placed in service without reducing the current hydrogen concentration. Plausible because the recombiner operating below the temperature range is correct and the 0.5% hydrogen concentration is the minimum to direct placing the recombiners in service.
- C. **Incorrect**, Recombiner 'A' is not operating in the range of 1150°F to 1400°F range where the recombination of hydrogen and oxygen occur but Recombiner 'B' can be placed in service with the current hydrogen concentration. Plausible because the recombiner is operating at an elevated temperature that appears in the procedure and placing Recombiner 'B' in service with the current hydrogen concentration is correct.
- D. **Incorrect**, Recombiner 'A' is not operating in the range of 1150°F to 1400°F range where the recombination of hydrogen and oxygen occur but Recombiner 'B' can be placed in service without reducing the current hydrogen concentration. Plausible because the recombiner is operating at an elevated temperature that appears in the procedure but still below the temperature range and the 0.5% hydrogen concentration is the minimum to direct placing the recombiners in service.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 58

Tier 2 Group 2

K/A 028 K3.01

Hydrogen Recombiner and Purge Control System (HRPS)

Knowledge of the effect that a loss or malfunction of the HRPS will have on the following:

Hydrogen concentration in containment

Importance Rating: 3.3 / 4.0

Technical Reference: FR-Z.1, High Containment Pressure, Rev. 18  
0-PI-OPS-083-151.A, Testing Hydrogen Recombiner  
System Train A, Rev 2

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.CGCS B.4.d

Describe the following characteristics of each major component in the Combustible Gas Control System  
d. Normal operating parameters

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New  \_\_\_\_\_

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis  \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 / 45.6 )

10CFR55.43.b ( n/a )

Comments:

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

029 G 2.1.31 059

Given the following:

- Unit 1 at 100% RTP.
- The crew has been preparing to place Train A Containment Purge in service in support of a containment lower entry by an RCS leak investigation team.
- Current plant conditions and indications are:
  - Containment Pressure is 0.16 psid.
  - Containment Purge Filter Assembly drain loop seal level is 60%.
  - Environmental Allowance Monitor (EAM) indicating lights are DARK.
  - Containment Rad Monitor 1-RM-90-112 is aligned to lower containment due to 1-RM-90-106 being out of service.

Which ONE of the following conditions must be changed to allow the purge to be placed in service?

- A. Pressure in containment.
- B. Radiation Monitor alignment.
- C. Environmental Allowance Monitor alignment.
- D. Purge Filter Assembly drain loop seal level.

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, Containment pressure is below the 0.23 psid maximum allowed pressure. Plausible because there is a limit on the maximum containment pressure for placing the purge in service or the applicant could conclude pressure is too low.*
- B. *Incorrect, The procedure allows the alignment of 0-RM-90-112 to lower containment. Plausible because 0-RM-90-106 is the normal lower containment radiation monitor and 0-RM-90-112 is the normal upper containment radiation monitor. The applicant could conclude both upper and lower containment needed a radiation monitor aligned.*
- C. **CORRECT**, *The EAMs must be placed in service which will cause the Blue lights on panel 1-M-3 to be illuminated.*
- D. *Incorrect, The drain loop seal level is above the 50% minimum required level. Plausible because there is a limit on the minimum drain loop seal level for placing the purge in service or the applicant could conclude the level is too low.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 59

Tier 2 Group 2

K/A 029 G 2.1.31

Containment Purge System (CPS)

Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup.

Importance Rating: 4.6 / 4.3

Technical Reference: 0-SO-30-3, Containment Purge System Operation,  
Rev 42

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.CONTPURGE B.5.a & .b  
Describe the operation of the Containment Purge System:  
a. Precautions and limitations  
b. Major steps performed while placing the system in service

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #  X   
New \_\_\_\_\_

Question History: SQN question CTMTPURGE-B.5.B 002 modified

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis  X

10 CFR Part 55 Content: ( 41.10 / 45.12 )

10CFR55.43.b ( n/a )

Comments: SQN question CTMTPURGE-B.5.B 002 modified.  
Stem conditions changed,  
Correct answer changed and relocated.  
Distractor changed or reworded.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

033 K04.01 060

Given the following:

- Unit 1 in Mode 5 making preparations to go to Mode 4.
- Unit 2 at 100% power
- A large leak occurs on the discharge line of the in-service Spent Fuel Pit Cooling System (SFPCS) pump.

Which ONE of the following identifies...

- (1) what would occur, without operator action, to stop the loss of level in the Spent Fuel Pit (SFP),  
and  
(2) after the leak was isolated, which of the listed makeup supplies would be used to restore the Spent Fuel Pit level in accordance with AOP-M.06, "Loss of Spent Fuel Cooling?"

(1)  
The SFPCS pump ...

(2)  
Makeup to the SFP would be from...

- |  |                                   |
|--|-----------------------------------|
| A. trips on low spent fuel pit level interlock.      | the Demin Water System            |
| B. trips on low spent fuel pit level interlock.      | the U-1 Refuel Water Storage Tank |
| C. becomes air-bound when the suction line uncovers. | the U-1 Demin Water System        |
| D✓ becomes air-bound when the suction line uncovers. | the U-1 Refuel Water Storage Tank |

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, the pump would not trip on low level, it would become air bound when the suction line uncovered and the makeup would not be from the Demin water system. It would be from a borated water source to maintain the minimum required boron concentration in the spent fuel pit. Plausible because there is a level switch that causes a low level alarm and many pumps do have a low level trip interlock with the pump controls. Also, the Demin water system is the preferred source when the makeup is due to evaporation causing the low level.*
- B. *Incorrect, the pump would not trip on low level, it would become air bound when the suction line uncovered but the makeup being from the borated water in the RWST is correct. Plausible because there is a level switch that causes a low level alarm and many pumps do have a low level trip interlock with the pump controls. Also, the RWST being the source of makeup is correct.*
- C. *Incorrect, the pump becoming air bound is correct, but the makeup would not be from the Demin water system. It would be from a borated water source to maintain the minimum required boron concentration in the spent fuel pit. Plausible because the pump becoming air bound is correct and the Demin water system is the preferred source when the makeup is due to evaporation causing the low level.*
- D. **CORRECT**, *the suction line is located below the surface but near the normal level of the SFP and when the strainer on the line is uncovered, the pump would lose suction and become air bound. Makeup would be from a borated water source to maintain the minimum required boron concentration in the spent fuel pit.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 60

Tier 2 Group 2

K/A 033 K04.01

Spent Fuel Pool Cooling System (SFPCS)

Knowledge of design feature(s) and/or interlock(s) which provide for the following:

Maintenance of spent fuel level

Importance Rating: 2.9 / 3.2

Technical Reference: 0-SO-78-1, Spent Fuel Pit Coolant System, Rev 41  
AOP-M.06, Loss of Spent Fuel Pit Level, Rev 4

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.SFPC B.4.e &.i B.5.c &.d  
Describe the following characteristics of each major component in the SFPC system:  
e. Component operation  
i. protective features  
Describe the operation of the SFPC system:  
c. Alarms and alarm response  
d. how a component failure will affect system operation

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #   X    
New \_\_\_\_\_

Question History: SQN bank question SFPC-15.A 001 modified.

Question Cognitive Level:

Memory or fundamental knowledge   X    
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 )

10CFR55.43.b ( n/a )

Comments: SQN bank question SFPC-15.A 001 modified.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

034 K6.02 061

Given the following:

- Both Units at 100% RTP.
- Fuel Assembly shuffles are being made in the Spent Fuel Pit.
- An instrument malfunction occurs on Spent Fuel Pit Radiation Monitor "0-RM-90-102"

Which ONE of the following identifies...

- (1) whether Technical Specifications would allow continued movement of fuel assemblies in the Spent Fuel Pit ,  
and
- (2) the Auxiliary Building isolation that would automatically initiate if the other Spent Fuel Pit Radiation Monitor "0-RM-90-103" subsequently detected Hi Radiation?

- A. (1) Fuel assembly shuffles must stop;  
(2) Both trains of isolation would be automatically initiated.
- B. (1) Fuel assembly shuffles must stop;  
(2) Only one train of isolation would be automatically initiated.
- C. (1) Fuel assembly shuffles can continue;  
(2) Both trains of isolation would be automatically initiated.
- D✓ (1) Fuel assembly shuffles can continue;  
(2) Only one train of isolation would be automatically initiated.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, Fuel shuffles would not have to be stopped, the movement could continue because only one Rad Mon is required in the Spent fuel Pit and both trains of isolation of the Aux Building would not be isolated if radiation was detected by the other SFP Radiation Monitor. The monitors are trained in respect to isolating the Auxiliary Building with 102 being Train A and 103 being Train B. Plausible because other conditions would cause fuel movement to be stopped and RM-09-101(on the Aux. Building Stack) would cause isolation of both trains.*
- B. *Incorrect, Fuel shuffles would not have to be stopped, the movement could continue because only one Rad Mon is required in the Spent fuel Pit. Plausible because other conditions would cause fuel movement to be stopped and only one train of the isolation in the Aux Building is correct.*
- C. *Incorrect, Tech Specs only require one SFP Radiation monitor and one ABGTS system to be operable for fuel movement in the Spent Fuel Pit. Both trains would not be isolated if radiation was detected by the other SFP Radiation Monitor. The monitors are trained in respect to isolating the Auxiliary Building with 102 being Train A and 103 being Train B. Plausible because fuel shuffle continuing is correct and RM-09-101(on the Aux. Building Stack) would cause isolation of both trains.*
- D. **CORRECT**, *Tech Specs only require one SFP Radiation monitor and one ABGTS system to be operable for fuel movement in the Spent Fuel Pit. The SFP Radiation Monitors are trained in respect to isolating the Auxiliary Building with 102 being Train A and 103 being Train B.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 61

Tier 2 Group 2

K/A 034 K6.02

Fuel Handling Equipment System (FHES)

Knowledge of the effect of a loss or malfunction on the following will have on the Fuel Handling System :

Radiation monitoring systems

Importance Rating: 2.6 / 3.3

Technical Reference: 1,2-47W611-30-5 R8  
1,2-47W611-30-6 R11  
Technical Specifications, Amendment 322

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.ABVENT B.5.d & 7  
Describe the operation of the AB Vent system as it relates to the following:  
d. How a component failure will affect system operation.  
State Tech Specs/TRM LCOs that govern the AB Vent system

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #  X   
New \_\_\_\_\_

Question History: SQN question 072 K4.05 modified

Question Cognitive Level:

Memory or fundamental knowledge  X   
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 / 45.7 )

10CFR55.43.b ( n/a )

Comments: SQN question 072 K4.05 modified  
Changes answer and distractors to test knowledge of conditions that allow systems to be used Fuel Handling.  
Correct answer relocation.  
Correct answer and distractor pertaining to Aux Building ventilation changed to address the isolation versus components within the isolation.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

041 K5.05 062

Given the following

- Unit 1 operating at 100% power when a total electrical loss of load event occurs.

Which ONE of the following identifies...

- (1) how the condenser steam dump system is designed to open the steam dump valves,  
and
- (2) if the steam dump valves failed to open, how the reactor coolant system (RCS) design pressure limit would be impacted?

Condenser Steam Dumps

RCS pressure...

- |  |   |
|--|---|
| A. trip open due to bistable operation | would exceed design pressure            |
| B✓ trip open due to bistable operation | would remain below the design pressure. |
| C. ramp open due to controller demand  | would exceed design pressure            |
| D. ramp open due to controller demand  | would remain below the design pressure. |

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, The first part of this distracter is plausible as it is correct. The second part is plausible because the steam dumps not open would cause the pressure to rise in the RCS.*
  
- B. **CORRECT**, *The condenser Steam Dump system is designed with a rapid blow open feature that is actuated by a bi-stable when the deviation of  $T_{avg}$  to  $T_{ref}$  is > than 10°F. The essential components to protect the RCS from exceeding its design pressure limit in a large loss of load event are the RCS PZR Safeties working in concert with the S/G safeties so the RCS design pressure limit would not be exceeded.*
  
- C. *Incorrect, The first part of the distracter is plausible as that on a small loss of load event the steam dump control system will operate by ramping or modulating on a  $T_{avg}$  -  $T_{ref}$  mismatch. On a large loss of load event the control system will create a signal (from a bi-stable) that "pops" open the steam dump valves. The second part is plausible because the steam dumps not open would cause the pressure to rise in the RCS.*
  
- D. *Incorrect, The first part of the distracter is plausible as that on a small loss of load event the steam dump control system will operate by ramping or modulating on a  $T_{avg}$  -  $T_{ref}$  mismatch. On a large loss of load event the control system will create a signal (from a bi-stable) that "pops" open the steam dump valves. The second part is plausible as it is correct.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 62

Tier 2 Group 2

K/A 041 K5.05

Knowledge of the operational implications of the following concepts as they apply to the SDS: Basis for the RCS design pressure limits

Importance Rating: 2.6 / 3.2

Technical Reference: FSAR Chapter 15

47W611-1-2 Main Steam Logics R10

TI-28, Attachment 9, 6/8/2007, Unit 1 & 2 Cycle Data Sheet

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.SDCS B.4.e, i & l

Describe the following items for each major for each major component in the SDCS as described in this lesson: component operation, protective features and types of accidents for which the SDCS components are designed.

OPT200.SG B.2

State the design basis of the S/G system as described in the FSAR.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New   X  

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge   X  

Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: (41.5 / 45.7 )

10CFR55.43.b ( n/a )

Comments:

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

071 A2.02 063

Given the following:

- Waste Gas Decay Tank 'B' is being released through Unit 1 Shield Building Exhaust Stack in accordance with 0-SO-77-15.

Subsequently, the following occurs:

- ABGTS fan A-A trips due to overcurrent.
- The AB AUO reports that Radiation Control Valve, 0-FCV-77-119 is OPEN.
- 0-RM-90-118, Waste Gas Effluent Radiation Monitor, is indicating normal.

Which ONE of the following identifies...

(1) if the reported position of 0-FCV-77-119 is Expected or Unexpected?

and

(2) If the release can be continued or is required to be terminated?

- A. (1) Expected  
(2) can be continued
- B. (1) Expected  
(2) is required to be terminated
- C. (1) Unexpected  
(2) can be continued
- D✓ (1) Unexpected  
(2) is required to be terminated

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, The first part of the distracter is plausible because the ABGTS low flow auto closing 0-FCV-77-119 is one of three auto close signals. In addition, the ABGTS is train specific and the examinee will need to remember that the ABGTS fans are shield building vent stack specific. Unit 1 is tied to the A ABGTS fan. The second part is plausible as the release is ongoing with the radiation monitor still operable and indicating normal.*
- B. *Incorrect, The first part of the distracter is plausible because the ABGTS low flow auto closing 0-FCV-77-119 is one of three auto close signals. In addition, the ABGTS is train specific and the examinee will need to remember that the ABGTS fans are shield building. vent stack specific. Unit 1 is tied to the A ABGTS fan. The second part is plausible because it is correct.*
- C. *Incorrect, 0-FCV-77-119 should have automatically closed due to low flow on the ABGTS fan so the reported position would be unexpected and the release cannot be continued. The first part of the distracter is plausible because it is correct. The second part is plausible as the release is ongoing with the radiation monitor still operable and indicating normal.*
- D. **CORRECT**, *The valve position is unexpected as the valve receives a close signal on the applicable ABGTS fan from flow switch 150/165. The correct response is to terminate the release because the calculated dilution flow has been lost and there is a caution in the procedure to terminate the release with a malfunction of FCV-77-119.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 63

Tier 2 Group 2

K/A 071 A2.02

Ability to (a) predict the impacts of the following malfunctions or operations on the Waste Gas Disposal System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:

Use of waste gas release monitors, radiation, gas flow rate, and totalizer.

Importance Rating: 3.3 / 3.6

Technical Reference: 0-SO-77-15, Waste Gas Decay Tank Release, R16

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL200.GRW B.5.d & e  
Describe the operation of the GRW system:  
d. How a component failure will affect system operation.  
e. How a support system failure will affect GRW system operation

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New   X  \_\_\_\_\_

Question History: New

Question Cognitive Level:  
Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis   X  \_\_\_\_\_

10 CFR Part 55 Content: ( 41.5 / 43.5 / 45.3 / 45.13 )

10CFR55.43.b ( n/a )

Comments:

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

079 A4.01 064

Given the following:

- Both units are operating at 100% power.
- Control air system pressure begins to drop.

Which ONE of the following identifies the pressure setpoint that the 0-PCV-33-4, "Service Air isolation from Control Air", will close and the expected position of 0-FCV-32-82, "Train A Control Air Supply Valve", to the auxiliary air system if the air pressure is stabilized at 73 psig?

**0-PCV-33-4**

**0-FCV-32-82**

- |     |         |        |
|-----|---------|--------|
| A.✓ | 88 psig | Open   |
| B.  | 88 psig | Closed |
| C.  | 77 psig | Open   |
| D.  | 77 psig | Closed |

**DISTRACTOR ANALYSIS:**

- A. *CORRECT, 0-PCV-33-4 automatically closes at 88 psig decreasing on the control air system but 0-FCV-82-32 does not close to isolate auxiliary air from control air until the air pressure drops to 69 psig, therefore it would have remained open.*
- B. *Incorrect, 0-PCV-33-4 automatically closes at 88 psig decreasing on the control air system is correct but 0-FCV-82-32 would not be expected to be closed since the pressure stabilized above its auto close setpoint. Plausible because 88 psig is correct for 0-PCV-33-4 and the aux air compressor do start at 77 psig which could be mistaken as the pressure that closes 0-FCV-32-82.*
- C. *Incorrect, 77 psig is the pressure that automatically starts the Aux Air Compressors, not the pressure that service air isolates from control air. Plausible because 77 psig is a setpoint that causes action in the control air system and 0-FCV-82-32 remaining open is correct because the pressure stabilized above the isolation setpoint of 69 psig.*
- D. *Incorrect, 77 psig is the pressure that automatically starts the Aux Air Compressors, not the pressure that service air isolates from control air and 0-FCV-32-82 would have remained open. Plausible because 77 psig is a setpoint that causes action in the control air system and 0-FCV-32-82 automatic close setpoint could be mistaken for other setpoints above 78 psig that result in an action in the control air system.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 64

Tier 2 Group 2

K/A 079 A4.01

Station Air System (SAS)

Ability to manually operate and/or monitor in the control room:

Cross-tie valves with IAS

Importance Rating: 2.7 / 2.7

Technical Reference: AOP-M.02, Loss of Control Air, Rev 14

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.CSA B.4.e &.i

Describe the following items for each major component  
in the CSA:

e. Component operation

i. Protective features (including sepoints)

Question Source:

Bank # \_\_\_\_\_

Modified Bank #   X   \_\_\_\_\_

New \_\_\_\_\_

Question History: SQN bank questions AIR-B.14.A 001

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_

Comprehension or Analysis   X   \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 / 45.5 to 45.8 )

10CFR55.43.b ( n/a )

Comments:

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

086 A3.03 065

Given the following:

- Both Units in service at 100% power.
- An alarm is received on 0-M-29.
- The CRO determines the alarm to be Cross Zone alarms from Zones 522 and Zone 523, both in Unit 2 Aux Building Supply Duct.

Which ONE of the following identifies how the Aux Bldg Supply and Exhaust Fans are automatically affected by these detection signals and the requirements for dispatching the Fire Brigade?

- A. All supply and exhaust fans trip; Immediately dispatch the Fire Brigade.
- B. All supply and exhaust fans trip; Verify fire exist prior to dispatching the Fire Brigade.
- C. Only the supply fans trip; Immediately dispatch the Fire Brigade.
- D. Only the supply fans trip; Verify fire exist prior to dispatching the Fire Brigade.

**DISTRACTOR ANALYSIS:**

- A. *CORRECT, Separation relays are used to cause the both the supply and exhaust fans to trip if smoke is detected by the cross zone detector in the supply ductwork of either unit. 0-AR-M-29 directs the Fire Brigade to be immediately dispatched if a cross zone alarm is received.*
- B. *Incorrect, Both the supply and exhaust fans will trip if smoke is detected by the cross zone detector in the ductwork of either unit. 0-AR-M-29 directs the Fire Brigade to be immediately dispatched if a cross zone alarm is received, not after a fire is confirmed. Plausible because both the supply and exhaust fans tripping is correct and if the detection signal had not been cross zoned , the alarm would be confirmed as real prior to dispatching the Fire Brigade.*
- C. *Incorrect, Both the supply and exhaust fans will trip will trip (not just the supply fans) but the Fire Brigade is dispatched immediately. Plausible because the detectors are only indicating trouble on the supply ductwork on one unit and immediately dispatching the Fire Brigade is correct.*
- D. *Incorrect, Both the supply and exhaust fans will trip (not just the supply fans) and 0-AR-M-29 directs the Fire Brigade to be immediately dispatched if a cross zone alarm is received, not after a fire is confirmed. Plausible because the detectors are only indicating trouble on the one unit supply ductwork and if the detection signal had not been cross zoned, the alarm would be confirmed as real prior to dispatching the Fire Brigade.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 65

Tier 2 Group 2

K/A 086 A3.03

Fire Protection System (FPS)

Ability to monitor automatic operation of the Fire Protection System including:  
Actuation of fire detectors

Importance Rating: 2.9 / 3.3

Technical Reference: 0-AR-M-29, Fire Detection System, Rev 8  
1,2-45W657-31 R4

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.HPFP B.5.c  
Describe the operation of the Fire Protections Systems  
as it relates to the following:  
c. Alarms and alarm response  
OPT200.ABVENT B.4.i  
Describe the following items for each major  
component in the Auxiliary Building Ventilation System  
as described in this lesson:  
i. Protective features (including setpoints)

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New  \_\_\_\_\_

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis  \_\_\_\_\_

10 CFR Part 55 Content: ( 41.7 / 45.5 )

10CFR55.43.b ( n/a )

Comments: New question

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

G 2.1.41 066

Given the following:

- A reactor core re-load is in progress with sixty assemblies loaded in the core.
- The movement of a Source Bearing Fuel assembly is in progress.
- Source Range Detector NI-31 indicating 9 cps.
- Source Range Detector NI-32 failed to bottom of scale.
- Both SRM High Flux at Shutdown switches are in "BLOCK" position.
- Annunciator "SOURCE RANGE HIGH SHUTDOWN FLUX ALARM BLOCK" is in alarm.
- Source Range counts are audible in containment.
- Annunciator "LS-78-3 SPENT FUEL PIT LEVEL HIGH-LOW" is in alarm.
- Spent Fuel Pit level is at elevation 726' 11".
- Spent Fuel Pit Boron concentration is 2180 ppm.

The Control Room crew is required to notify the Refueling SRO to suspend Core Alterations because of which ONE of the following?

- A. Spent Fuel Pit level is below the minimum.
- B. Only one Source Range Nuclear Monitor is in service.
- C. Spent Fuel Pit boron concentration is below the minimum.
- D. Source Range High Flux Level at Shutdown alarm must be in service.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, The level at the identified elevation is slightly above the high level alarm setpoint so the level is not below the Tech Spec minimum. Plausible because if the level were low the same alarm would be in and there is a Tech Spec requirement to have 23 feet of water above the fuel or immediately suspend fuel movement.*
- B. **CORRECT**, *Tech Spec require both source range monitors to be in service and if not fuel movement is must be suspended immediately.*
- C. *Incorrect, The boron concentration is above the Tech Spec minimum requirement of 2000ppm not below the Tech Spec minimum. Plausible because if the boron concentration was lower than the minimum there is a Tech Spec requirement to immediately suspend fuel movement.*
- D. *Incorrect, The High flux at Shutdown Alarm is not required to be in service with the identified conditions. Plausible because the alarm is normally in service but may be blocked. 0-RT-NUC-000-002.0, Core Configuration, and GO-9, Refueling Operations, address blocking the alarm during movement of Source Bearing Fuel Assembly.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 66

Tier 3

K/A G 2.1.41  
Conduct of Operations  
Knowledge of the refueling process.

Importance Rating: 2.8 / 3.7

Technical Reference: Technical Specifications, Section 9, Refueling,  
Amendment 322  
0-RT-NUC-000-002.0, Core Reconfiguration , Rev 20  
GO-9, Refueling Operations, Rev 34

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271GO-9 B.  
Give the bases for the Tech Spec LCO associated with  
refueling.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #  X  \_\_\_\_\_  
New \_\_\_\_\_

Question History: SQN question REFUELING-B.1.C 001 modified

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis  X  \_\_\_\_\_

10 CFR Part 55 Content: ( 41.2 / 41.10 / 43.6 / 45.13 )

10CFR55.43.b ( n/a )

Comments: SQN question REFUELING-B.1.C 001 modified

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

G 2.1.42 067

Given the following:

- Unit 1 is in Mode 6 with core reloading in progress.

In accordance with FHI-3, "Movement of Fuel," which ONE of the following identifies a condition which would require fuel loading to be immediately stopped?

- A. One Source Range Monitor increases by a factor of five (5) during the loading of the fourth (4<sup>th</sup>) fuel assembly.
- B. Both Source Range Monitors increase by a factor of two (2) during the loading of the seventh (7<sup>th</sup>) fuel assembly.
- C. One Source Range Monitor increases by a factor of five (5) during the loading of the tenth (10<sup>th</sup>) fuel assembly.
- D. Both Source Range Monitors increase by a factor of two (2) during the loading of the thirteenth (13<sup>th</sup>) fuel assembly.

DISTRACTOR ANALYSIS:

- A. *Incorrect, the requirement to stop if one source range monitor increases by a factor of 5 is not applicable until after the twelfth fuel assembly is loaded. Plausible because one source range monitor increasing by a factor of 5 would require the fuel movement to be stopped after the twelfth fuel assembly is loaded*
- B. *Incorrect, the requirement to stop if both source range monitors increase by a factor of 5 is not applicable until after the twelfth fuel assembly is loaded. Plausible because both source range monitor increasing by a factor of 5 would require the fuel movement to be stopped after the twelfth fuel assembly is loaded*
- C. *Incorrect, the requirement to stop if one source range monitor increases by a factor of 5 is not applicable until after the twelfth fuel assembly is loaded. Plausible because one source range monitor increasing by a factor of 5 would require the fuel movement to be stopped after the twelfth fuel assembly is loaded*
- D. **CORRECT**, if both of the source range monitors increase by a factor of 2 after the twelfth fuel assembly is loaded, FHI-3 requires fuel movement to be stopped.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 67

Tier 3

K/A G 2.1.42  
Knowledge of new and spent fuel movement procedures.

Importance Rating: 2.5 / 3.4

Technical Reference: FHI-3, Movement of Fuel, Rev 55

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.FH B.5.a  
Describe the operation of the Fuel Handling system as it relates to the following:  
a. Precautions and limitations

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #   X    
New \_\_\_\_\_

Question History: SQN question FHI-B-18B 002 modified

Question Cognitive Level:

Memory or fundamental knowledge   X    
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: ( 41.10 / 43.7 / 45.13 )

10CFR55.43.b ( n/a )

Comments: SQN question FHI-B-18B 002 modified  
Relocated correct answer.  
Changed setup of information in the stem and moved information from the choices to the stem.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

G 2.2.23 068

In accordance with OPDP-8, "Limiting Conditions for Operation Tracking," which ONE of the following identifies the official time of entry into an LCO action statement and the person responsible for entering an LCO into the LCO Tracking Log.

- | <u>Official time is the time entered in the ...</u> | <u>Person responsible for entering an LCO into the LCO Tracking Log</u> |
|---|---|
| A. Unit Log   | Control Room Operator (CRO)   |
| <b>B. Unit Log</b>                                  | Unit Supervisor (US)  |
| C. LCO Tracking Log                                 | Control Room Operator (CRO)   |
| D. LCO Tracking Log                                 | Unit Supervisor (US)  |

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, Unit Log being the official log is correct but the Unit Supervisor (not the Control Room Operator) is responsible for entering an LCO into the LCO Tracking Log. Plausible because the Unit Log is the official log and the Control Room Operator is responsible for other administrative control room activities.*
- B. **CORRECT**, OPDP-8 section 3.2.2 identifies the Unit Log as the official log for LCOs and Sections 3.2.2 & 3.4.4 identify the Unit Supervisor as being the person responsible for entering an LCO into the LCO Tracking Log.
- C. *Incorrect, the Unit Log is the official log (not the LCO Tracking Log) and the Unit supervisor (not the Control Room Operator) is responsible for entering an LCO into the LCO Tracking Log. Plausible because the LCO Tracking Log is used to track current LCO entries and exits along with LCO that could become applicable if unit conditions changed and the Control Room Operator is responsible for other administrative control room activities..*
- D. *Incorrect, the Unit Log is the official log (not the LCO Tracking Log) but the Unit supervisor (not the Control Room Operator) is responsible for entering an LCO into the LCO Tracking Log. Plausible because the LCO Tracking Log is used to track current LCO entries and exits along with LCO that could become applicable if unit conditions changed and the Unit supervisor being responsible for LCO Tracking entries is correct.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 68

Tier 3

K/A G 2.2.23

Ability to track Technical Specification limiting conditions for operations.

Importance Rating: 3.1 / 4.6

Technical Reference: OPDP-8, Limiting Conditions for Operation Tracking,  
Rev 0002

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271OPDP-8 B.3  
What are the requirements of the responsibilities  
section in this procedure.  
What are the documentation requirements for LCO  
entries and exits.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank #  X  \_\_\_\_\_  
New \_\_\_\_\_

Question History: WBN question OPDP-8.02 002 modified

Question Cognitive Level:

Memory or fundamental knowledge  X  \_\_\_\_\_  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: ( 41.10 / 43.2 / 45.13 )

10CFR55.43.b ( n/a )

Comments: WBN question OPDP-8.02 002 modified

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

G 2.2.44 069

Given the following:

- Unit 1 is being returned to 100% power after a refueling outage.
- The unit is at approximately 50% power with the following bistable conditions on the Status Panels.
  - Channel 1 P-9 Bistable Light LIT
  - Channel 2 P-9 Bistable Light LIT
  - Channel 3 P-9 Bistable Light DARK
  - Channel 4 P-9 Bistable Light DARK

Which ONE of the following identifies...

- (1) if an automatic reactor trip would currently occur if the turbine tripped,  
and  
(2) how the Status Panel P-9 bistable indications would be affected as the load  
increase was continued?

- A✓ (1) The Reactor would automatically trip.  
(2) All four P-9 Status lights would be LIT.
- B. (1) The Reactor would automatically trip.  
(2) All four P-9 Status lights would be DARK.
- C. (1) The Reactor would NOT automatically trip.  
(2) All four P-9 Status lights would be LIT.
- D. (1) The Reactor would NOT automatically trip.  
(2) All four P-9 Status lights would be DARK.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. **CORRECT**, With 2 of the 4 bistables made, the reactor would automatically trip if a turbine trip occurred and if the load increase was continued on the unit, it would result in the bistable being lit on all 4 channels.
- B. **Incorrect**, With 2 of the 4 bistables made, the reactor would automatically trip if a turbine trip occurred but if the load increase was continued on the unit, it would not result in the bistable being dark on all 4 channels (the bistables would be lit.) Plausible because the reactor tripping is correct and other bistables/permissive windows do go dark as power is raised. The permissive window "P-9 Low POWER TURB TRIP-REAC TRIP BLOCK' DOES GO DARK" as power is raised above 50%.
- C. **Incorrect**, With 2 of the 4 bistables made, the automatic reactor trip due to a turbine trip would not be blocked (the reactor would trip) but if the load increase was continued on the unit, it would not result in the bistable being lit on all 4 channels. Plausible because it takes 3 of the 4 clearing to block the trip as power is reduced but only 2 of the 4 to make as power is raised (and the two can be confused) and all 4 bistables being lit is correct.
- D. **Incorrect**, With 2 of the 4 bistables made, the automatic reactor trip due to a turbine trip would not be blocked (the reactor would trip) and if the load increase was continued on the unit, it would not result in the bistable being dark on all 4 channels (the bistables would be lit.) Plausible because it takes 3 of the 4 clearing to block the trip as power is reduced but only 2 of the 4 to make as power is raised (and the two can be confused) and other bistables/permissive windows do go dark as power is raised. The permissive window "P-9 Low POWER TURB TRIP-REAC TRIP BLOCK' DOES GO DARK" as power is raised above 50%.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 69

Tier 3

K/A G 2.2.44

Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.

Importance Rating: 4.2 / 4.4

Technical Reference: 0-47W611-99-2 R13  
0-47W611-99-6 R2  
0-GO-5, Normal Power Operation, Rev 0062

Proposed references to be provided to applicants during examination: None

Learning Objective: OPT200.RPS B.4.d, .g, .h, and .i  
Describe the following characteristics of each major component in the Reactor Protection & Engineered Safety Features Actuation Systems;  
d. Normal operating parameters  
g. Interlocks (including setpoints)  
h. Instrumentation and Indications  
i. Protective features (including setpoints)

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New  \_\_\_\_\_

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis  \_\_\_\_\_

10 CFR Part 55 Content: ( 41.5/43.5/45.12 )

10CFR55.43.b ( n/a )

Comments:

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

G 2.3.11 070

Given the following:

- Unit 1 at 100% RTP.
- The crew is performing AOP-R.06, "High RCS Activity" due to elevated RCS activity.

Which ONE of the following is an action directed during performance of AOP-R.06 to limit/reduce the potential for radioactive release?

- A. Align Turbine Building Sump to the LVWT Pond.
- B. Raise the SG Atmospheric Relief Valves setpoint.
- C. Place the CVCS cation bed demineralizer in service.
- D. Place the condensate polisher mixed beds in service.

**DISTRACTOR ANALYSIS:**

- A. Incorrect, Aligning the Turbine Building Sump to the LVWT Pond is not an action directed in AOP-R.06. Plausible because the action is directed during a SGTL/SGTR to prevent a radioactive release.*
- B. Incorrect, Raising the setpoints on the SG Atmospheric Relief Valves is not an action directed in AOP-R.06. Plausible because the action is directed during a SGTL/SGTR to prevent a radioactive release.*
- C. CORRECT, Place the CVCS cation bed demineralizer in service based on Chem Lab recommendation is directed in AOP-R.06. Placing the bed in service would reduce the RCS activity level and thus reduce any release*
- D. Incorrect, Placing the condensate polishers in service is not an action directed action in AOP-R.06. Plausible because the beds would limit the spread of radiation during a SGTL to prevent a radioactive release until the decision was made to bypass them.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 70

Tier 3

K/A G 2.3.11  
Ability to control radiation releases.

Importance Rating: 3.8 / 4.3

Technical Reference: AOP-R.06, High RCS Activity, Rev 10

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271AOP-R.06 B.5  
Summarize the mitigating strategy that initiated entry  
into AOP-R.06.

Question Source:

Bank #   X    
Modified Bank #             
New           

Question History: SQN bank question G2.3.11 070

Question Cognitive Level:

Memory or fundamental knowledge   X    
Comprehension or Analysis           

10 CFR Part 55 Content: ( 41.11 / 43.4 / 45.10 )

10CFR55.43.b ( n/a )

Comments: Written for a SQN Audit exam in 2007.  
Minor wording changes to stem and distractors,  
Changed distractor from 'Close MSIVs' to 'Align Turbine Building Sump to  
the LVWT Pond.'  
Changed location of correct answer.  
Originally from BVPS bank

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

G 2.3.5 071

Which ONE of the following identifies the maximum number of alarm(s) that an individual exiting the RCA may receive without requiring RADCON support prior to exiting the area?

Personnel Contamination Monitor

Small Article Monitor

- |    |     |      |
|----|-----|------|
| A✓ | One | None |
| B. | One | One  |
| C. | Two | None |
| D. | Two | One  |

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. **CORRECT**, an individual exiting the RCA may receive one alarm on a PCM and subsequently try a second time in the same or another PCM. It second monitoring is clear the individual may exit the RCA. It is plant expectation/policy that all personnel on site carry gloves as PPE any time entering the operating spaces and it is RADCON policy to not carry gloves on the person into a PCM, but to use the SAM to check them for contamination. If the SAM alarms it will "lock" and require RADCON to enter password to open the SAM and either do a recount or remove for closer examination. Therefore only no alarm will allow exit w/o RADCON support.
- B. **Incorrect**, The first part of this distracter is plausible as it is correct. The second part is plausible as it would seem that the standards for the PCM would be the same for the SAM allowing a second chance to clear the scan. In fact station policy does allow RADCON only to try a second scan to clear items.
- C. **Incorrect**, The first part of this distracter is plausible as a second chance is allowed in the same or another PCM. The examinee will need to discriminate that after receiving a second alarm on a separate PCM that he/she is done and needs RADCON support. The second part is plausible because it is correct.
- D. **Incorrect**, The first part of this distracter is plausible as a second chance is allowed in the same or another PCM. The examinee will need to discriminate that after receiving a second alarm on a separate PCM that he/she is done and needs RADCON support. The second part is plausible as it would seem that the standards for the PCM would be the same for the SAM allowing a second chance to clear the scan. In fact station policy does allow RADCON only to try a second scan to clear items.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 71

Tier 3 Group \_

K/A G 2.3.5

Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.

Importance Rating: 2.9 / 2.9

Technical Reference: RCI-01, Radiation Protection Program, Rev. 67  
RCI-05.303, Calibration, Response Check and  
Operation of the Thermo Electron Small Article Monitor  
(SAM-11), Rev. 001

Proposed references to be provided to applicants during examination: None

Learning Objective: RWT010 CON-08  
Explain how to monitor personnel and personal items  
for contamination including the use of: personnel  
contamination monitors.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New   X  

Question History: New

Question Cognitive Level:

Memory or fundamental knowledge   X    
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: (41.11 / 41.12 / 43.4 / 45.9 )

10CFR55.43.b ( n/a )

Comments:

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

G 2.3.7 072

Given the following:

- Both Units at 100% power.
- You are performing an observation of an AUO assigned to the Auxiliary Building and are logged on to RWP-003, "Routine Operations and Surveillance" activities.

Which ONE of the following identifies a condition that would require additional Rad Ops approval prior to performance of the activity while in the Auxiliary Building?

- A. Obtaining a flashlight from the Hot Tool Room.
- B. Enter a pump room posted as a "Radiation Area."
- C. Access the Auxiliary Building Roof to perform equipment inspections.
- D. Use a ladder to access a valve handwheel in the overhead on El. 714.

**DISTRACTOR ANALYSIS:**

- A. Incorrect, The general RWP covers entry into contaminated areas without additional RAD OPS support. Plausible because the general RWP would not cover work in an area posted as a "High Contamination Area".*
- B. Incorrect, The general RWP covers entry into radiation areas without additional RAD OPS support. Plausible because the general RWP would not cover work in an area posted as a "High Radiation Area."*
- C. Incorrect, The general RWP covers entry onto the Auxiliary Building Roof without additional RAD OPS support. Plausible because the going onto the Auxiliary Building Roof could be construed as exiting the AUX building.*
- D. CORRECT, RCI -01, "Radiation Protection Program" General Requirement 'T' identifies the requirement to notify RAD OPS for permission prior to accessing any overhead area except for permanently installed platforms.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 72

Tier 3

K/A: G 2.3.7

Ability to comply with radiation work permit requirements during normal or abnormal conditions.

Importance Rating: 3.5 / 3.6

Technical Reference: RCI-01, Radiation Protection Program, Rev 66,  
General Requirement 'T'

Proposed references to be provided to applicants during examination: None

Learning Objective: No objective identified

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New  \_\_\_\_\_

Question History: New Question

Question Cognitive Level:

Memory or fundamental knowledge  \_\_\_\_\_  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: ( 41.12 / 45.10 )

10CFR55.43.b ( n/a )

Comments: New Question

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

G 2.4.11 073

Given the following:

- Unit 1 at 100% RTP.
- A failure of the Pressurizer pressure controller occurs.

In accordance with AOP-I.04, "Pressurizer Instrument and Control Malfunctions," which ONE of the following identifies...

- (1) the immediate action step(s) required for the failure of the pressure controller  
and  
(2) how the immediate actions steps are identified in the AOP?

- A. (1) Check normal spray valves closed.  
(2) The step ~~text~~ is written in boldface.

- B✓ (1) Check normal spray valves closed.  
(2) By a note preceding the step.

- C. (1) Check normal spray valves and pressurizer PORVs closed.  
(2) The step text is written in boldface.

- D. (1) Check normal spray valves and pressurizer PORVs closed.  
(2) By a note preceding the step.

## QUESTIONS REPORT

for 2009 RO Retake Exam Questions

### DISTRACTOR ANALYSIS:

- A. *Incorrect, "CHECK normal spray valves CLOSED" is the immediate action step in AOP-1.04 but the Immediate Operator Action steps are not identified by boldface type. Plausible because Checking Spray valves closed being the required Immediate Operator Action step is correct and boldface type is used for Cautions in the procedures.*
- B. *CORRECT, AOP-1.04 Section 2.3 , "Pressurizer Pressure Instrument OR Controller Malfunction;" identifies Step1 "CHECK normal spray valves CLOSED" as the only immediate action and EPM-4, " User's Guide," states that Immediate Operator Action steps will be identified by circling the step numbers or by a note preceding the step(s).*
- C. *Incorrect, Checking PORVs closed is not an Immediate Operator Action step for a failed pressurizer pressure controller and the Immediate Operator Action steps are not identified by boldface type. Plausible because Checking PORVs closed is a required Immediate Operator Action step in other section of AOP-1.04 and boldface type is used for Cautions in the procedures.*
- D. *Incorrect, Checking PORVs closed is not an Immediate Operator Action step for a failed pressurizer pressure controller. Immediate Operator Action steps are identified by circling the step numbers or by a note preceding the step(s). Plausible because Checking PORVs closed is a required Immediate Operator Action step in other section of AOP-1.04 and Immediate Operator Action steps are identified by circling the step numbers or by a note preceding the step(s)*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 73

Tier 3

K/A G 2.4.11  
Emergency Procedures / Plan  
Knowledge of abnormal condition procedures.

Importance Rating: 4.0 / 4.2

Technical Reference: AOP-I.04, Pressurizer Instrument and Control  
Malfunctions, Rev. 9  
EPM-4, User's Guide, Rev. 20

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271AOP-I.04 B.3  
Describe the initial operator respond to stabilize the  
plant upon entry into AOP-I.04.  
OPL271EPM-4 B.7  
Given plant operating conditions, determine if EOP  
entry conditions have been met and state the resultant  
appropriate actions steps for those conditions.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New  \_\_\_\_\_

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge  \_\_\_\_\_  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: ( 41.10 / 43.5 / 45.13 )

10CFR55.43.b ( n/a )

Comments:

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

G 2.4.16 074

Consider the following two cases:

- #1 - Unit 1 experiences a Reactor trip in conjunction with a loss of all Component Cooling Water (CCS).
- #2 - Unit 1 experiences a Reactor trip in conjunction with a loss of all Essential Raw Cooling Water (ERCW).

Which ONE of the following identifies how the Emergency Operating Procedures (EOP's) and the Abnormal Operating Procedures (AOP's) would be prioritized to respond to these events?

- A. E-0, "Reactor Trip or Safety Injection," would have priority over the applicable AOP in both cases.
- B. The applicable AOP would have priority over E-0, "Reactor Trip or Safety Injection," in both cases.
- C. The AOP for loss of CCS would have priority over E-0, "Reactor Trip or Safety Injection" but the AOP for the loss of ERCW would NOT have priority over E-0.
- D✓ The AOP for loss of ERCW would have priority over E-0, "Reactor Trip or Safety Injection" but the AOP for the loss of CCS would NOT have priority over E-0.

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, EPM-4 provides that EOPs have priority over AOPs except for 3 cases [Appendix R Fire (AOP-N.08), Control Room Abandonment (AOP-C.04), or Loss of all ERCW (AOP-M-1)]. Plausible because EOPs normally have priority over other type procedures including AOPs.*
- B. *Incorrect, There are 3 cases that the AOPs have priority [Appendix R Fire (AOP-N.08), Control Room Abandonment (AOP-C.04), or Loss of all ERCW (AOP-M-1)]. Loss of CCS is not one of the priority AOPs. Plausible because there are AOPs that have priority over EOPs.*
- C. *Incorrect, There are 3 cases that the AOPs have priority [Appendix R Fire (AOP-N.08), Control Room Abandonment (AOP-C.04), or Loss of all ERCW (AOP-M-1)]. Loss of CCS is one not of the priority AOPs. Plausible because there are AOPs that have priority over EOPs.*
- D. **CORRECT**, *EPM-4 provides that EOPs have priority over AOPs except when a reactor trip or safety injection has occurred in conjunction with an Appendix R Fire (AOP-N.08), Control Room Abandonment (AOP-C.04), or Loss of all ERCW (AOP-M-1). AOP for the loss of ERCW is one of the listed priority AOPs.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 74

Tier 3

K/A G 2.4.16

Knowledge of EOP implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, and severe accident management guidelines.

Importance Rating: 3.5 / 4.4

Technical Reference: EPM-4, Users Guide, Rev. 20

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271EPM-4, B.4.8

Given plant operating conditions, determine if AOP entry conditions have been met and state the resultant appropriate actions for those conditions.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New  X  \_\_\_\_\_

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge \_\_\_\_\_  
Comprehension or Analysis  X  \_\_\_\_\_

10 CFR Part 55 Content: ( 41.10 / 43.5 / 45.13 )

10CFR55.43.b ( n/a )

Comments:

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

G 2.4.37 075

Given the following:

- A Site Area Emergency has been declared on Unit 1.
- The operating crew is responding in accordance with the emergency instructions.

(1) Which of the following describes the initial location the AUOs will report to?

and

(2) When the emergency centers are staffed and activated, who will conduct the brief of the operations teams dispatched from the OSC?

<u>Location</u>	<u>Briefed by the...</u>
A. 2 AUOs report to the MCR Remainder report to the OSC	OSC Operations Advisor
B. 2 AUOs report to the MCR Remainder report to the OSC	Control Room Operator
C✓ 2 AUOs report to the OSC Remainder report to the MCR	OSC Operations Advisor
D. 2 AUOs report to the OSC Remainder report to the MCR	Control Room Operator

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

**DISTRACTOR ANALYSIS:**

- A. *Incorrect, first part is incorrect, two AUOs will report to the OSC (verses MCR) with remaining to the MCR (verse OSC), the second part is correct as teams dispatched by the OSC will be briefed by OSC personnel, most likely the OSC Operations Advisor SRO. This distracter is plausible, in the first part both locations are valid with only the number of AUOs reporting to each different and the second part is correct.*
- B. *Incorrect, first part is incorrect, two AUOs will report to the OSC (verses MCR) with remaining to the MCR (verse OSC), the second part is incorrect as teams dispatched by the OSC will be briefed by OSC (verses CRO) personnel, most likely the OSC Operations Advisor SRO. This distracter is plausible, in the first part both locations are valid with only the number of AUOs reporting to each different and the second part reflects who normally briefs AUOs.*
- C. *CORRECT, two AUOs will report to the OSC with remaining to the MCR, teams dispatched by the OSC will be briefed by OSC personnel, most likely the OSC Operations Advisor SRO.*
- D. *Incorrect, the first part is correct as two AUOs will report to the OSC with remaining to the MCR. The second part is incorrect as teams dispatched by the OSC will be briefed by OSC (verses CRO) personnel, most likely the OSC Operations Advisor SRO. The distracter is plausible as the first part is correct and the second part reflects who normally briefs AUOs.*

**QUESTIONS REPORT**  
for 2009 RO Retake Exam Questions

Question No. 75

Tier 3

K/A G 2.4.37

Knowledge of the lines of authority during implementation of the emergency plan

Importance Rating: 3.0 / 4.1

Technical Reference: EPIP-7, "Activation and Operation of the OSC", R26

Proposed references to be provided to applicants during examination: None

Learning Objective: OPL271.REP B.0

Demonstrate an understanding of NUREG 1122 Knowledge and Abilities associated with Radiological Emergency Plan that are rated  $\geq 2.5$  during Initial License Training and  $\geq 3.0$  during License Operator Requalification Training for the appropriate license position as identified in Appendix A.

Question Source:

Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_  
New  \_\_\_\_\_

Question History: New question

Question Cognitive Level:

Memory or fundamental knowledge  \_\_\_\_\_  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: (41.10 / 45.13 )

10CFR55.43.b ( n/a )

Comments:

**BANK INFORMATION REPORT**  
for 2009 RO Retake Exam Questions

Item Type	#Items	Title
MCS	75	Multiple choice: single

Category 1 (Source)	#Items	Title
BANK	17	
BANK MOD	28	
NEW	30	

Category 2 (Source If Bank)	#Items	Title
	30	
BRAIDWOOD	1	
COMMANCHE PEAK	1	
COOK 2004 EXAM	1	
NORTH ANNA	1	
POINT BEACH	2	
SQN	37	
WATTS BAR	2	

Category 3 (Cognitive Level)	#Items	Title
HIGHER	45	
LOWER	30	

Category 4 (Difficulty)	#Items	Title
	75	

Category 5 (Job Position)	#Items	Title
RO	75	

Category 6 (Plant)	#Items	Title
SEQUOYAH	75	

Category 7 (Date)	#Items	Title
1/2009 RETAKE	75	

Category 8 (Last 2 NRC?)	#Items	Title
NO	75	