

QUESTIONS REPORT
for 1503 RO Exam

1. 008 AG2.2.37 001

Given the following plant conditions:

- Unit 1 is operating at 100% power.
- The following alarm is received:
 - PS-68-301 PRESSURIZER RELIEF TANK PRESS HIGH (1-M5A, D-1)
- PZR PORV 68-340 acoustic monitor indicates discharge.
- The OATC places the PORV Control Switch in CLOSE.
- PZR Pressure continues to lower with both **Red and Green** light indication for the PORV **extinguished**.
- The OATC closes the associated block valve and PZR Pressure stops dropping and is now at 2110 psig and rising slowly.

Which ONE of the following identifies the **MINIMUM** required actions in accordance with Technical Specifications?

- A. **Maintain** power available to associated block valve;
Restore RCS pressure to ≥ 2220 psia.
- B. **Maintain** power available to associated block valve;
Restore RCS pressure to ≥ 2235 psia.
- C. **Remove** power from the associated block valve;
Restore RCS pressure to ≥ 2235 psia.
- D. **Remove** power from the associated block valve;
Restore RCS pressure to ≥ 2220 psia.

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DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since there is a condition when power would remain on the block valve, however power would not be maintained because unable to cycle the leaking PORV. Also plausible since the second part is correct.*
- B. *Incorrect, Plausible since there is a condition when power would remain on the block valve, however power would not be maintained because unable to cycle the leaking PORV. Also plausible since 2235 psia would be 2220 psig which is the normal pressure control setpoint, the candidate could think that pressure needs to be returned to the normal setpoint.*
- C. *Incorrect, Plausible since the first part is correct. Also plausible if the candidate thinks that RCS pressure must be returned to its normal value of 2220 psig to maintain compliance with the Tech Spec.*
- D. *Correct, In accordance with Tech Spec 3.4.3.2, for a PORV that cannot be cycled from the MCR power must be removed from the block valve within 1 hour. Also in accordance with Tech Spec 2.3.5 the RCS pressure must be returned to the minimum DNB pressure of 2220 psia.*

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Question Number: 1

Tier: 1 **Group** 1

K/A: 008 Pressurizer Vapor Space Accident.
AG 2.2.37 Ability to determine operability and/or availability of safety related equipment.

Importance Rating: 3.6 / 4.6

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate determine the required action necessary for a PORV which is stuck partially open and actions necessary to restore RCS conditions to within minimum Tech Spec requirements.

Technical Reference: AOP-I.04 rev 12
Tech Spec 3.2.5
Tech Spec 3.4.3.2
0-SO-68-3 rev 26

Proposed references to be provided: None

Learning Objective: OPTSTG.PZR-PRT
Obj 12

Question Source:
New
Modified Bank
Bank X

Question History: SQN bank question

Comments:

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2. 009 EA1.14 002

Given the following plant conditions:

- Unit 1 was at 100% power.
 - The crew manually tripped the Reactor and initiated a Safety Injection due to a Small Break LOCA.
 - RCS pressure is 1300 psig and stable
 - Core exit T/Cs are 550°F
 - Containment pressure is 2.9 psig and stable
 - All SG pressures are 1000 psig and stable.
-
- The crew is preparing to initiate the RCS cooldown in accordance with ES-1.2, "Post LOCA Cooldown and Depressurization."

Which ONE of the following completes the statement below?

RCS cooldown to Cold Shutdown can commence (1) , and the operators will use the (2) .

- A. immediately
Steam Dumps
- B. immediately
Atmospheric Reliefs
- C. only after verifying adequate shutdown margin
Steam Dumps
- D. only after verifying adequate shutdown margin
Atmospheric Reliefs

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DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since the first part is correct the cooldown is commenced when the step in the procedure is reached. Also plausible since the guidance in the procedure is to use Steam Dumps to cooldown, however if the candidate does not recognize that the MSIVs would be closed due to Phase B, the Steam Dumps are not available, thus Atmospheric Reliefs must be used.*

- B. *Correct, With CNMT pressure > 2.8 psig (phase B) the MSIVs are closed, thus the Atmospheric Reliefs would have to be used. Also for ES-1.2 the cooldown to Cold Shutdown is commenced when the step in the procedure is reached. Adequate shutdown margin will be obtained with borated water from SI flow.*

- C. *Incorrect, Plausible since other emergency procedures require that adequate shutdown margin for cold shutdown be established before cool down can be commenced when plant conditions have stabilized (such as ES-0.2). Also plausible since the guidance in the procedure is to use Steam Dumps to cooldown, however if the candidate does not recognize that the MSIVs would be closed due to Phase B, the Steam Dumps are not available, thus Atmospheric Reliefs must be used.*

- D. *Incorrect, Plausible since other emergency procedures require that adequate shutdown margin for cold shutdown be established before cool down can be commenced when plant conditions have stabilized (such as ES-0.2). Also plausible since the second part is correct.*

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Question Number: 2

Tier: 1 **Group** 1

K/A: 009 Small Break LOCA
EA1.14 Ability to operate and monitor the following as they apply to a
Small Break LOCA:
Secondary pressure control.

Importance Rating: 3.4 / 3.4

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate determine how Secondary Pressure control would be controlled based on plant conditions during the forced cooldown phase of a Small Break LOCA.

Technical Reference: TI-28 attachment 9
ES-1.2, rev 19

Proposed references to be provided: None

Learning Objective: OPL271ES-1.2

Question Source:

New	<u> X </u>
Modified Bank	<u> </u>
Bank	<u> </u>

Question History: New question written for 1503 ILT exam.

Comments:

QUESTIONS REPORT
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3. 011 EK3.15 003

Given the following plant conditions:

- Unit 2 has experienced a large break LOCA
- Conditions are met for entry into ES-1.3, "Transfer to RHR Containment Sump."

Which ONE of the following completes the statements below?

Containment sump level must be (1) to initiate auto sump swap over to ensure (2) .

- A✓ (1) $\geq 11\%$
(2) containment sump level is high enough to provide adequate suction head for the RHR pumps.
- B. (1) $\geq 11\%$
(2) sufficient RWST water has been sprayed into the containment atmosphere to limit post accident Iodine concentration.
- C. (1) $\geq 18\%$
(2) containment sump level is high enough to provide adequate suction head for the RHR pumps.
- D. (1) $\geq 18\%$
(2) sufficient RWST water has been sprayed into the containment atmosphere to limit post accident Iodine concentration.

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DISTRACTOR ANALYSIS:

- A. *Correct, In accordance with FSAR chapt 6, when the RWST low level (27%) is received enough water has been injected into the RCS and thus into Containment to ensure that sufficient water level (> 11%) exists. This will allow for sump swapover and ensure RHR pump suction head requirements are met after swapover is completed.*
- B. *Incorrect, Plausible since the first part is correct. Also plausible since limiting iodine in the containment atmosphere is a function of containment spray, however containment spray is for limiting Peak CNMT pressure during the first stages of a LOCA. CNMT spray after the sump swapover when sufficient ice has melted and added sodium tetra-borate will then provide for iodine retention.*
- C. *Incorrect, Plausible if the candidate gets the minimum level in CNMT for CNMT spray pump suction confused with the auto swapover value. In accordance with ES-1.3, after verifying that CNMT sump level is > 18% then the operators manually align CNMT spray pumps to take a suction on the CNMT SUMP. Also plausible since the second part is correct.*
- D. *Incorrect, Plausible if the candidate gets the minimum level in CNMT for CNMT spray pump suction confused with the auto swapover value. In accordance with ES-1.3, after verifying that CNMT sump level is > 18% then the operators manually align CNMT spray pumps to take a suction on the CNMT SUMP. Also plausible since limiting iodine in the containment atmosphere is a function of containment spray, however containment spray is for limiting Peak CNMT pressure during the first stages of a LOCA. CNMT spray after the sump swapover when sufficient ice has melted and added sodium tetra-borate will then provide for iodine retention.*

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Question Number: 3

Tier: 1 **Group** 1

K/A: 011 Large Break LOCA
EK3.15 Knowledge of the reasons for the following responses as they apply to a Large Break LOCA:
Criteria for shifting to recirculation mode.

Importance Rating: 4.3 / 4.4

10 CFR Part 55: 41.5, 41.10

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate identify the reason for the setpoint at which Containment Sump Swapover is to occur.

Technical Reference: FSAR chapt 6
1-AR-M6-C rev 43
ES-1.3, rev 21

Proposed references to be provided: None

Learning Objective: OPL271ES-1.3

Question Source:
New X
Modified Bank
Bank

Question History: New question written for 1503 ILT exam

Comments:

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4. 022 AA2.04 004

Given the following plant conditions:

- Unit 1 was operating at 100% power when FCV-62-93, Charging Flow Control, malfunctioned to limit total charging flow to 65 gpm.
 - The plant is at normal operating temperature, pressure and level
 - Normal letdown is in service on a 75 gpm orifice
 - Identified leakage is 10 gpm
 - Unidentified leakage is .01 gpm
 - RCP seal leak-off is 3 gpm per pump

If **NO** operator actions are taken, approximately how much time will elapse before the following alarm is received:

"LS-68-335E/D PRZR LVL LOW HEATER OFF & LETDOWN SECURED"

(Assume PZR is 62 gal/%)

- A. 63 minutes
- B. 83 minutes
- C. 116 minutes
- D. 133 minutes

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if candidate misreads the charging flow and uses 55 gpm based on the minimum value of charging if flow controller fails to minimum.
Thus 63 minutes
Total flow out of RCS = **20** + 10 + 12 + 0 = 42 gpm : 63 minutes*
- B. *Correct,
PZR level @ 100% power = 60% : Letdown isolates @ 17% : 60 - 17 = 43% x 62 gal/% = 2666 gallons.
Delta charging & letdown = **10 gpm** : Identified leakage = **10 gpm** : Unidentified leakage = **.01 gpm** (negligible) : RCP seal leakoff = 4x3= **12 gpm** into VCT.
Total flow out of RCS = 10 + 10 + 12 + 0 = 32 gpm : 83 gpm*
- C. *Incorrect, if the candidate uses 3 gpm as RCP seal leak off vs 12 gpm total
Total flow out of RCS = 10 + 10 + **3** + 0 = 23 gpm = 115.9*
- D. *Incorrect, Plausible if candidate does not use seal leakoff flow as leakage
Total flow out of RCS = 10 + 10 + **0** + 0 = 20 gpm + 133 minutes*

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Question Number: 4

Tier: 1 **Group** 1

K/A: 022 Loss of Reactor Coolant Makeup:
AA2.04 Ability to determine and interpret the following as they apply to the
Loss of Reactor Coolant Makeup:
How long PZR level can be maintained within limits

Importance Rating: 2.9 / 3.8

10 CFR Part 55: 41.7

10CFR55.43.b: 5

K/A Match: This question matches the K/A by having the candidate use plant knowledge and determine how long PZR level would stay within the normal operating limits given a failure in the makeup portion of the CVCS.

Technical Reference: Tech Spec 3.4.6.2
1-AR-M5-A rev 39

Proposed references to be provided: None

Learning Objective: OPT200.CVCS

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question

Comments:

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5. 025 AG2.1.28 005

Given the following plant conditions:

- Unit 1 RCS is in Midloop condition
- B Train RHR is in service
- Eight S/G Nozzle Dams are installed
- Subsequently, Nonessential Control Air Header depressurizes to 0 psig

Which ONE of the following identifies the impact on the plant?

- A. RHR flow will lower resulting a loss of RHR shutdown cooling.
- B. CVCS charging will rise resulting in RCS overfill and overflow out the S/G manways.
- C. CVCS charging flow will lower and will result in reduced RCS level and possible RHR pump cavitation.
- D. RHR flow will rise but will be limited by valve restraints preventing RHR suction vortexing and loss of shutdown cooling.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if the candidate thinks that the affected RHR Hx flow control valve would fail closed on a loss of control air - since they fail open, loss of flow is not possible based on this error mode.*
- B. *Incorrect, Plausible however charging flow will increase due to the failure of 62-89 and 62-93 open, the nozzle dams should prevent overflow out the manways since RCS is required to have a vent path when nozzle dams are installed. The pressure head with the PZR PORV vent path is insufficient to blow-out the nozzle dams.*
- C. *Incorrect, Plausible if the candidate gets confused about the direction of failure of FCV-62-93 and thinks it will fail closed vs open.*
- D. *Correct, 0-GO-13 Appx S directs the installation of a blocking device on FCV-74-16 and 74-28. The device is intended to prevent the RHR Hx flow control valves from failing full open upon a loss of control air. The full open position (without the blocking device) of these valves may increase RHR flowrate and cause cavitation during midloop level operation. (Reinforced by AOPs M.02 & R.03).*

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Question Number: 5

Tier: 1 **Group** 1

K/A: 025 Loss of RHR
AG 2.1.28 Knowledge of the purpose and function of major system components and controls.

Importance Rating: 4.1 / 4.1

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by the candidate determine how the RHR system will respond, based on system design, to a malfunction (loss of instrument air).

Technical Reference: 0-GO-13, rev 84
AOP-M.02 rev 23

Proposed references to be provided: None

Learning Objective: OPT200.RHR Obj 9.b
OPL271AOP-M.02

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question

Comments:

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DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since the the first part is correct, at 2205 psig all PZR heaters will be energized. However with the Master controller in Manual, the spray valves will not automatically open. Candidate may select this answer if they do not recognize that the spray valves are being controlled in manual and will not respond to high pressure signal.*
- B. *Incorrect, Plausible if the candidate does not recognize that all heaters will remain on since the master pressure controller was placed in manual after all heaters were energized. Also the spray valves are being controlled in manual and will not respond to high pressure signal.*
- C. *Correct, With Pressurizer pressure dropping to 2205 psig, all PZR heater banks will be energized in an attempt to return RCS pressure to its normal value. Also with the master pressure controller in Manual, the spray valves will not function to control pressure, however PORV 68-334 is not controlled by master controller output. PORV will open at setpoint to control pressure.*

PORV 68-340 is controlled by master controller in manual and will not open to control pressure. Student may confuse PORVs.

- D. *Incorrect, Plausible since the second part is correct, the PZR pressure will be controlled by PORV 68-334 when the master pressure controller is in Manual. However if the candidate does not recognize that all heaters will remain on since the master pressure controller was placed in manual after all heaters were energized, then the candidate may select this answer.*

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Question Number: 6

Tier: 1 **Group** 1

K/A: 027 Pressurizer Pressure Control System Malfunctions
AK2.03 Knowledge of the interrelationships between the Pressurizer
Pressure Control Malfunctions and the following:
Controllers and positioners

Importance Rating: 2.6 / 2.8

10 CFR Part 55: 41.7

10CFR55.43.b: not applicable

K/A Match: This question matches the K/A by having the candidate determine how the output of the master pressure controller, in automatic or manual, will affect the operation of the PZR heaters and/or spray valves.

Technical Reference: TI-28 Attachment 9
AOP-I.04 rev 12

Proposed references to be provided: None

Learning Objective: OPT200PZR-PRT obj. 9

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question written for Dec 2012 exam.

Comments:

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7. 029 EK2.06 007

Given the following plant conditions:

- Unit 1 at 100% power
- A transient occurs that requires a manual reactor trip.
- The OATC attempts to trip the reactor but the reactor fails to trip.

Which ONE of the following completes the statement below relative to the failure of the reactor trip breakers that would have caused the reactor **NOT** to trip and the local action(s) required to trip the reactor?

The Reactor Trip Breaker's 125V dc shunt trip coils failed to (1) and to trip the reactor locally (2) Reactor Trip Breaker(s) must be open.

(1)

(2)

A. energize

only one

B. energize

both

C. de-energize

only one

D. de-energize

both

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DISTRACTOR ANALYSIS:

- A. *Correct, the shunt trip coils should be energized from the reactor trip hand switches (and from the SSPS for the reactor trip breaker) and if this did not occur then one of the two breaker trip devices would not function, thus contributing to the ATWS along with whatever caused the UV coil on the breakers to also fail to trip the breakers. Opening either one of the breakers would cause the reactor to trip.*

- B. *Incorrect, The failure to energize the reactor trip breaker shunt coils contributing to the reactor failing to trip is correct but both breakers do not have to be open to cause a reactor trip, only one has to be opened. Plausible because the failure to energize the shunt coils is correct and the breakers scheme could be mistaken to be in parallel instead of series because there is a bypass breaker in parallel with each reactor trip breaker*

- C. *Incorrect, The the reactor trip switch actuation (and SSPS signal for RTB) energizes the shunt trip coils to cause a trip, so the failure would be to energize not failure to de-energize and the reactor would trip when either breaker was opened. Plausible because the failure to deenergize the coils would be correct concerning the undervoltage coils and the reactor tripping after either of the breakers opening is correct.*

- D. *Incorrect, The the reactor trip switch actuation (and SSPS signal for RTB) energizes the shunt trip coils to cause a trip, so the failure would be to energize not failure to de-energize and the reactor trip would not required both breakers to be open. It would trip when either breaker was opened. Plausible because the failure to deenergize the coils would be correct concerning the undervoltage coils and the breakers scheme could be mistaken to be in parallel instead of series because there is a bypass breaker in parallel with each reactor trip breaker*

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Question Number: 7

Tier: 1 **Group** 1

K/A: 029 Anticipated Transient Without Scram (ATWS)
EK2.06 Knowledge of the interrelations between the following an ATWS:
Breakers, relays, and disconnects

Importance Rating: 2.9* / 3.1*

10 CFR Part 55: 41.7 / 45.7

10CFR55.43.b: Not applicable

K/A Match: Applicant is required demonstrate the knowledge of how the reactor trip breakers and relays that control their operation are related to the reactor trip system if malfunctions occur and the actions required to disconnect the power to control rods locally during an ATWS event.

Technical Reference: 1,2-45N699-1 R10
1,2-47W611-99-1 R11

Proposed references to be provided: None

Learning Objective: OPT200.RPS obj. 9

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question E-0-B.0 001modified and modeled on question used on Diablo Canyon 2007 exam

Comments:

QUESTIONS REPORT
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8. 038 EK1.02 008

Given the following plant conditions:

- A SGTR has occurred in S/G #1 on Unit 1.
- The RCS cooldown, depressurization and ECCS flow termination steps of E-3, "Steam Generator Tube Rupture," have been completed.
- Normal charging and letdown have been established.

- Current plant conditions are:
 - Pressurizer level 60%
 - Ruptured S/G NR level 82%
 - Ruptured S/G pressure 1040 psig
 - RCS pressure 1000 psig

As directed in E-3, Step 32, "CONTROL RCS pressure and charging flow to minimize RCS-to-secondary leakage," which ONE of the following identifies the required action to be taken?

REFERENCE PROVIDED

- A. Lower charging flow.
- B. Raise charging flow.
- C. Turn on pressurizer heaters.
- D. RCS should be depressurized.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if the candidate misinterprets the dynamics of the RCS and S/G and selects the action for the misinterpreted condition.*
- B. *Incorrect, Plausible if the candidate uses the table incorrectly and takes the action for the wrong PZR level.*
- C. *Correct, In accordance with E-3, step 32 table, with SG pressure lower than the RCS pressure, the level in the ruptured S/G should be lowering. With PZR level at 60% the table directs the operator to energize PZR heaters.*
- D. *Incorrect, Plausible if the candidate misinterprets the dynamics of the RCS and S/G and selects the action for the misinterpreted condition.*

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Question Number: 8

Tier: 1 **Group** 2

K/A: 038 Steam Generator (S/G) Tube Rupture
AK1.02 Knowledge of the operational implications of the following concepts
as they apply to Steam Generator Tube Rupture:
Leak rate vs. pressure drop

Importance Rating: 3.3 / 3.5

10 CFR Part 55: 41.8, 41.10

10CFR55.43.b: n/a

K/A Match: This question matches KA by having the candidate determine the actions necessary to stabilize PZR level and Ruptured S/G level during a SGTR and examines the interrelationship between primary to secondary leak rate and how it is affected as RCS pressure and Inventory and Ruptured S/G pressure and inventory are changed.

Technical Reference: E-3 Steam Generator Tube Rupture, step 32, rev 21.

Proposed references to be provided: None

Learning Objective: OPL271E-3

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question.

Comments:

QUESTIONS REPORT
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9. 054 AA1.03 009

Given the following plant conditions:

- Unit 1 is at 35% power doing a plant startup.
- 1A MFW pump is in service.
- The "MFPT B RESET/TRIP" handswitch on 1-M-3 has the Green light LIT.
- Subsequently the 1A MFW pump trips.

Which ONE of the following identifies:

(1) when the TDAFW pump starts

and

(2) the source of the cooling water for the TDAFW pump bearings?

- A✓ (1) immediately on the MFP trip
(2) a stage on the TDAFW pump
- B. (1) when the SG level setpoint is reached
(2) the ERCW system
- C. (1) when the SG level setpoint is reached
(2) a stage on the TDAFW pump
- D. (1) immediately on the MFP trip
(2) the ERCW system

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DISTRACTOR ANALYSIS:

- A. *Correct, With the "B" MFPT tripped and its trip bus energized, when the "A" MFPT trips it causes the TDAFW pump to immediately start. Also the cooling water supply to the lube oil system for the TDAFW pump comes from one of the stages on the discharge and is sent back to the suction of the pump. This flow is only provided when the TDAFW pump is running.*

- B. *Incorrect, Plausible since the TDAFW pump would get a start signal from SG level following a plant trip and would be the only start signal present if the "B" MFPT was not already in a tripped condition with its trip bus energized. Also plausible since ERCW is the normal source of cooling water to safeguards equipment. The cooling water supply to the lube oil system for the TDAFW pump comes from one of the stages on the discharge and is sent back to the suction of the pump. This flow is only provided when the TDAFW pump is running.*

- C. *Incorrect, Plausible since the TDAFW pump would get a start signal from SG level following a plant trip and would be the only start signal present if the "B" MFPT was not already in a tripped condition with its trip bus energized. Also plausible since the second part is correct. ERCW is the normal source of cooling water to safeguards equipment.*

- D. *Incorrect, Plausible since the first part is correct, the TDAFW pump starts immediately. Also plausible since ERCW is the normal source of cooling water to safeguards equipment.*

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Question Number: 9

Tier: 1 **Group** 1

K/A: 054 Loss of Main Feedwater
AA1.03 Ability to operate and/or monitor the following as they apply to Loss of Main Feedwater:
AFW auxiliaries, including oil cooling water supply

Importance Rating: 3.5 / 3.7

10 CFR Part 55: 41.7

10CFR55.43.b: not applicable

K/A Match: This question matches the K/A by testing the candidates knowledge of the source of cooling water used for the Turbine Driven AFW pump and when that cooling water is being supplied.

Technical Reference: 1,2-47W803-2 rev 69
1,245N646-1 rev 23
TI-28 attachment 9

Proposed references to be provided: None

Learning Objective: OPT200.AFW obj 6.e; obj 8.b

Question Source:
New X
Modified Bank
Bank

Question History: New question written for 1503 ILT exam

Comments:

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10. 055 EA1.02 010

Given the following plant conditions:

- Unit 1 has experienced a total loss of power.
- The crew has entered ECA-0.0, " Loss of All AC Power."
- The crew was unable to start a diesel generator from the main control room.
- An AUO has been dispatched to the DG building.

Which ONE of the following identifies the required sequential procedural actions that are required to start the 1A-A DG locally in accordance with ECA-0.0, Appendix F, "Local DG Operation?"

The (1) will place the DG mode selector switch in the Pull for Local Transfer position and the AUO will press the (2).

- A. (1) AUO
(2) Auto Start Pushbutton
- B. (1) CRO
(2) Auto Start Pushbutton
- C. (1) AUO
(2) Trip to Local pushbutton, then the Auto Start Pushbutton
- D. (1) CRO
(2) Trip to Local pushbutton, then the Auto Start Pushbutton

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since there are local controls for the DGs and the candidates may think that all of the actions necessary are performed locally by the AUO.*
- B. *Incorrect, Plausible if the candidate does not recall the proper sequence to procedure steps necessary to locally start the DG.*
- C. *Incorrect, Plausible since there are actions which are required to be performed locally, however the first action is NOT correct and the the second part is correct.*
- D. *Correct, In accordance with ECA-0.0 Loss of All AC, Appendix F the requirements for a local EDG start are identified. The CRO mode selector switch is placed in Pull-to-Local-Transfer position, then the AUO depresses the Trip-to-Local pushbutton, then the Auto Start pushbutton.*

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Question Number: 10

Tier: 1 **Group** 1

K/A: 055 Loss of Offsite and Onsite Power (Station Blackout)
EA1.02 Ability to operate and monitor the following as they apply to a
Station Blackout:
Manual ED/G start

Importance Rating: 4.3 / 4.4

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matched the K/A by having the candidate identify the actions necessary for the AUO to locally start a DG if it has failed to start from the MCR.

Technical Reference: ECA-0.0, Appendix F, rev 26
1,2-45N767-2 rev 31
1,2-45N767-5 rev 20

Proposed references to be provided: None

Learning Objective: OPL271ECA-0.0, Obj 6

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question formerly ECA-0.0-B.6.A #2

Comments:

QUESTIONS REPORT
for 1503 RO Exam

11. 056 AA2.60 011

Given the following plant conditions:

- Unit 2 is at 100% power.
- A Loss of Off-Site power occurs.
- A blown fuse has caused the normal Loop 2 MSIV valve position light indication on the handswitch to be lost.

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

The Loop 2 MSIV will (1) and the position of the Loop 2 MSIV (2) be determined from the MONITOR LIGHTS 2-XX-55-6L panel.

- A. (1) remain open indefinitely
 (2) can
- B. (1) remain open indefinitely
 (2) can **NOT**
- C. (1) eventually fail closed
 (2) can
- D. (1) eventually fail closed
 (2) can **NOT**

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since the MSIVs are held open by air pressure and they are provided with accumulators, however they will stay open only for a short period of time following a loss of offsite power due to a loss of control air pressure. Also plausible since the second part is correct.*

- B. *Incorrect, Plausible since the MSIVs are held open by air pressure and they are provided with accumulators, however they will stay open for a only short period of time following a loss of offsite power due to a loss of control air pressure. Also plausible if the candidate does not recall that the MSIV positions are displayed on the status monitoring panel in the control room.*

- C. *Correct, The MSIVs are provided air from normal station control air and will go closed after some period of time without control air which is lost during a Loss of Offsite power. SG 2 Main Steam Line Isolation valve position is displayed not only on the handswitch in the main control room but also on 2-XX-55-6L monitoring panel. Power supply to the PAM indications is different than the power supplied to the handswitch indications.*

- D. *Incorrect, Plausible since the first part is correct. Also plausible if the candidate does not recall that the MSIV positions are displayed on the status monitoring panel in the control room.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 11

Tier: 1 **Group** 1

K/A: 056 Loss of Off-site Power
AA2.60 Ability to determine and interpret the following as they apply to
Loss of Off-site Power:
MSIV open

Importance Rating: 2.7 / 2.9

10 CFR Part 55: 41.7, 41.10

10CFR55.43.b: 5

K/A Match: This question matches the K/A by having the candidate determine the status of Loop 2 Main Steam Isolation Valve during a Loss of Offsite Power and where to determine its position.

Technical Reference: 2-47W610-1-1 rev 21
1,2-45N601-5 rev 7
1,2-45N601-6 rev 2
AOP-P.01 rev 32

Proposed references to be provided: None

Learning Objective: OPL271AOP-P.01
OPT200.MS obj 9

Question Source:
New X
Modified Bank
Bank

Question History: New question written for 1503 ILT exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

12. 057 AA2.18 012

Given the following plant conditions:

- Unit 2 is operating at 100% power.
- Subsequently,
 - 120V AC VITAL PWR BD 2-III UV OR BKR TRIP (2-M-1C, C-7) alarm is LIT.
- Channel III status lights are LIT

In accordance with AOP-P.04, "Loss of Unit 2 Vital Instrument Power Board," which ONE of the following completes the statement below?

 (1) would indicate OPEN and the crew will be required to (2) .

- A. (1) 2-HS-68-340D, Loop 1 PZR spray
 (2) manually close the valve
- B. (1) 2-HS-68-340D, Loop 1 PZR spray
 (2) trip the reactor
- C. (1) 2-FCV-62-135, RWST TO CCP
 (2) manually close the valve
- D. (1) 2-FCV-62-135, RWST TO CCP
 (2) trip the reactor

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible, since a loss of VIPB 2-III does effect the Loop 1 spray valve, however it results in isolation of A train essential air, not but does not cause the Loop 1 spray valve to open. This would make Loop 1 spray valve unavailable for pressure control. Also plausible since a loss of VIPB-III does result in a loss of valve indication for Loop 2 spray valve, however loop 2 spray valve is available for pressure control. Loop 2 spray valve is supplied by Train B essential air.*

- B. *Incorrect , Plausible, since a loss of VIPB 2-III does effect the Loop 1 spray valve, however it results in isolation of A train essential air, not but does not cause the Loop 1 spray valve to open. This would make Loop 1 spray valve unavailable for pressure control. Also plausible if the candidate thinks that the valve goes open and given a loss of RCS pressure control, a reactor trip would be logical.*

- C. *Incorrect, Plausible since the first part is correct. Also plausible to think that if the suction valve went open to close the valve. However the direction in AOP-P.04 is for the operators to trip the reactor since the suction valve could not be closed from the MCR.*

- D. *Correct, In accordance with AOP-P.04, if VIPB 2-III loses power the interposing relays associated with the RWST suction valves for the CCP for train A causes the RWST valve to open. This will cause a rapid boration of the RCS, thus the operators are directed to trip the reactor.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 12

Tier: 1 **Group** 1

K/A: 057 Loss of Vital Instrument Bus
AA2.18 Ability to determine and interpret the following as they apply to
Loss of Vital AC Instrument Bus:
The indicator, valve, breaker, or damper position which will occur on a loss
of power.

Importance Rating: 3.1 / 3.1

10 CFR Part 55: 41.7

10CFR55.43.b: 5

K/A Match: This question matches the K/A by having the candidate determine
the effect on the CCP suction valves during a loss of a Vital
Instrument board and the direction required to be taken for this
condition.

Technical Reference: AOP-P.04 rev 32

**Proposed references
to be provided:** None

Learning Objective: OPT200.AC120V Distribution obj. 8
OPL271AOP-P.03 & P.04 obj. 9

Question Source:

New	<u> X </u>
Modified Bank	<u> </u>
Bank	<u> </u>

Question History: New question written for 1503 ILT exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

13. 058 AG2.4.49 013

Given the following plant conditions:

- Unit 1 is at 39% power.
- 1A MFPT is in-service.
- The following alarms are initially received:

125V DC VITAL BAT BD II ABNORMAL (1-M-1C, B-5)
FS-3-48B STM GEN LOOP 2 STEAM/FEEDWATER FLOW MISMATCH
(1-M6-B, B7)

- Loop 2 S/G level is 40% and lowering
- Loop 1, 3 and 4 S/G levels are stable and on program.
- Loop 2 S/G FW inlet flow indicators are reading down scale LOW.
- All other 125V DC Vital Board II indications and alarms are NORMAL.

Which ONE of the following identifies the required immediate action(s), to be taken in accordance with AOP-S.01, "Loss of Normal Feedwater?"

Take manual control of _____ .

- A✓ Loop #2 Main Feed Reg valve, attempt to control SG level. Manual Rx Trip will be required
- B. Loop #2 Bypass Feed Reg valve and restore S/G level
- C. 1A MFPT Speed controller, raise its speed and restore Loop #2 S/G level
- D. MFPT 1A & 1B Master Speed controller, raise its output and restore Loop #2 S/G level

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *Correct, If fuse KED25 blows, the VBB abnormal alarm will be in alarm. Also if this fuse blows, the Loop #2 MFRV will fail closed. Per AOP-S.01, the RO will be directed to attempt to control the Main or Bypass FRV to return level to program. Manual control of the MFRV will not work due to the FRV being failed closed. Thus a reactor trip will be required per the immediate actions due to SGWL trip being imminent.*

- B. *Incorrect, Plausible since direction to control SG loop #2 using the bypass is part of AOP-S.01, however at 39% power S/G level will continue to rapidly lower which would require a reactor trip due to an imminent reactor trip on low S/G water level.*

- C. *Incorrect, Plausible since there is guidance in AOP-S.01 to take manual control of a MFP speed control if the candidate thinks that the alarms are caused by a loss of MFP speed control. Also a loss of automatic speed control would cause feedflow to lower and generate a Low Feedflow alarm. However the alarms are indicative of a failed feed reg valve not a failure of MFPT speed control.*

- D. *Incorrect, Plausible because a loss of MFPT speed control would require taking manual control of the MFP (Master or Individual controller). A loss of MFP speed control could result in low FW inlet flow and lowering SG water levels. However the FRV is failed closed and this action would not restore level.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 13

Tier: 1 **Group** 1

K/A: 058 Loss of DC Power
AG2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.

Importance Rating: 4.6 / 4.4

10 CFR Part 55: 41.10

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate determine the failure of equipment indicated by the alarms and the appropriate immediate operator action required for the indicated loss of DC power failure.

Technical Reference: AOP-S.01 rev 21
1-AR-M1-C rev 48

Proposed references to be provided: None

Learning Objective: OPL271AOP-S.01

Question Source:

New	<u> X </u>
Modified Bank	<u> </u>
Bank	<u> </u>

Question History: New question written for 1503 ILT exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

14. 077 AK3.01 014

Given the following plant conditions:

- Unit-1 is operating at 80% power.
- Due to grid disturbances the crew had entered AOP-P.07, "Degraded Grid Conditions or Generator Voltage Regulator Malfunction."
- Grid frequency has held steady at 59 Hz for twenty minutes.
- The Unit Supervisor directs the OATC to trip the reactor.

In accordance with AOP-P.07, "Degraded Grid Conditions or Generator Voltage Regulator Malfunction," which ONE of the following identifies the reason for this required action?

- A. The Tech Spec limit for frequency on a D/G has been exceeded.
- B. To prevent exceeding 25% of lifetime limit of off-frequency operation of LP turbine.
- C. The auto reactor trip setpoint has been exceeded.
- D. To prevent exceeding improper bearing loading and turbine misalignment.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since there is a Tech Spec low frequency limit, and the candidate could choose this reason, however the setpoint is < 58.8 Hz not 59 Hz which is given in the stem.*
- B. *Correct, In accordance with AOP-P.07, Appendix B, if frequency is < 59.5 Hz for more than 15 minutes a manual Rx trip is directed as an Administrative limit to prevent exceeding more than 25% of lifetime limit for off-frequency operation of the LP turbine.*
- C. *Incorrect, Plausible there are low grid frequency trip values and the candidate could get the values confused. The low frequency trip is 57 Hz not 59 Hz.*
- D. *Incorrect, Plausible since there is direction in 0-GO-4, to limit the bearing loading and misalignment which would raise turbine vibration, however this limit is for temperature difference between condensers not low grid frequency.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 14

Tier: 1 **Group** 1

K/A: 077 Generator Voltage and Electric Grid Disturbances
AK3.01 Knowledge of the reasons for the following responses as they apply to Generator Voltage and Electric Grid Disturbances:
Reactor and turbine trip criteria

Importance Rating: 3.9 / 4.2

10 CFR Part 55: 41.4, 41.5, 41.7 and 41.10

10CFR55.43.b: n/a

K/A Match: KA is matched because the question requires the ability to interpret the criteria to trip the reactor or turbine as they apply to conditions with a Generator Voltage and Electric Grid Disturbance.

Technical Reference: AOP-P.07 Rev 5

Proposed references to be provided: None

Learning Objective: OPTSTG200.SWYD obj. 12.g

Cognitive Level:

Higher X
Lower _____

Question Source:

New _____
Modified Bank _____
Bank X

Question History: SRO question (#81) originally developed for Sept 2010 exam but not used. Re-worded for RO level question.

Comments:

QUESTIONS REPORT
for 1503 RO Exam

15. W/E04 EK1.3 015

Given the following plant conditions:

- Unit 2 is at 100% power.
- Subsequently a LOCA outside containment occurs.
- The crew trips the reactor and initiates safety injection.
- The crew has transitioned to ECA-1.2, "LOCA Outside Containment."

Which ONE of the following completes the statement below?

The **first** action that will be performed to isolate the leak is to close (1) valves one at a time and the operators will check (2) to determine if the LOCA has been isolated.

- A✓ (1) RHR cold leg injection
(2) RCS pressure
- B. (1) RHR cold leg injection
(2) PZR level
- C. (1) Safety Injection pump cold leg injection
(2) RCS pressure
- D. (1) Safety Injection pump cold leg injection
(2) PZR level

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *Correct, The mitigating strategy used in ECA-1.2 is to attempt to isolate the leak by isolating RHR cold leg injection one at time. Also in accordance with ECA-1.2, the operators are directed to monitor RCS pressure as an indicator that the LOCA has been isolated.*
- B. *Incorrect, Plausible since the first part is correct. Also plausible since the normal method determining if an RCS leak has been isolated is to monitor PZR (such as AOP-R.05)*
- C. *Incorrect, Plausible if the candidate thinks that since SI pumps are located in the Aux Bldg that the strategy of isolating the SI pumps would be used to identify and isolate the leak, however RHR is more likely since it is a lowpressure system which could be subject to high pressure and possible failure. Also plausible since the second part is correct.*
- D. *Incorrect, Plausible if the candidate thinks that since SI pumps are located in the Aux Bldg that the strategy of isolating the SI pumps would be used to identify and isolate the leak, however RHR is more likely since it is a lowpressure system which could be subject to high pressure and possible failure. Also plausible since the normal method determining if an RCS leak has been isolated is to monitor PZR (such as AOP-R.05)*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 15

Tier: 1 **Group** 1

K/A: W/E04 LOCA Outside Containment
EK1.3 Knowledge of the operational implications of the following concepts as they apply to LOCA Outside Containment:
Annunciators and conditions indicating signals, and remedial actions associated with the LOCA Outside Containment

Importance Rating: 3.5 / 3.9

10 CFR Part 55: 41.8 , 41.10

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate identify the accident in progress by the indications and alarms that are given and recall the remedial actions that will be performed to mitigate the event.

Technical Reference: ECA-1.2 Rev 10
EPM-3-ECA-1.2 Rev 2

Proposed references to be provided: None

Learning Objective: OLP271ECA-1.2

Question Source:
New X
Modified Bank
Bank

Question History: New question for 1503 ILT exam.

Comments:

QUESTIONS REPORT
for 1503 RO Exam

16. W/E05 EK3.4 016

Given the following plant conditions:

- FR-H.1, "Loss Of Secondary Heat Sink", is in progress.
- RCS feed and bleed had been initiated.
- Auxiliary Feedwater (AFW) capability was restored.
- All Steam generators (SGs) indicate 8% Wide Range level and 90 psig.
- Core exit TCs are stable at 552°F.

Which ONE of the following identifies an acceptable method of re-establishing feed flow under these conditions and the reason why?

- A. Feed ONLY one SG at a rate of 50 to 100 gpm to prevent MSIV closure due to negative rate signal.
- B. Feed ONLY one SG at a rate of 50 to 100 gpm to minimize thermal stresses to the SG components.
- C. Feed ALL SGs at maximum rate to ensure the minimum AFW flow required for heat sink is established to allow termination of bleed and feed.
- D. Feed ALL SGs at maximum rate to establish minimum steam generator level requirements to allow termination of RCS bleed and feed.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible because only one steam generator should be fed and the feed rate is within the 50-100 gpm range and the MSIV's do have a negative rate isolation signal.*
- B. *Correct, One SG is fed at a rate of 50-100 gpm to minimize thermal shock and potential damage to the SG tubesheet when SGs are hot and dry. After feeding a minimal rate, flow may be raised when wide range level exceeds 10%.*
- C. *Incorrect, Plausible because the level is below the requirement for heat sink and establishing maximum flow to all steam generators would provide a flow rate above the minimum for heat sink. However, having heat sink flow established does not allow the termination of bleed and feed. The steam generator level requirement must be met to terminate.*
- D. *Incorrect, Plausible with bleed and feed established, it is desirable to establish the required steam generator level that permits termination of bleed and feed as quickly as possible and because if the core exit temperatures had been rising a maximum flow rate would have been established to a steam generator.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 16

Tier: 1 **Group** 1

K/A: W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink
EK3.4 Knowledge of the reasons for the following responses as they apply to a Loss of Secondary Heat Sink:
RO and SRO function within the control room team as appropriate to the assigned position, is such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated.

Importance Rating: 3.7 / 3.9

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate determine the actions necessary to be performed to maintain the plant in a safe condition when mitigating a Loss of Secondary Heat Sink emergency event.

Technical Reference: FR-H.1, Loss of Secondary Heat Sink, Rev 19
EPM-3-FR-H.1 rev 9

Proposed references to be provided: None

Learning Objective: OPL271FR-H.1

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question used on 1/2009 ILT exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

17. W/E11 EK2.2 017

Given the following plant conditions:

- At 0900, Unit 2 reactor trips.
- At 0920 a small break LOCA occurs.
- At 0950 the crew transitioned to ECA-1.1, "Loss of RHR Sump Recirculation", due to the failure of both RHR pumps.
- Crew has reduced ECCS flow to 1 SIP and 1 CCP per ECA-1.1.
- SI flow cannot be terminated due to lack of subcooling.
- At 1030 the crew is performing ECA-1.1 Step 21 RNO to establish the **minimum** required ECCS flow to remove decay heat.

Which ONE of the following identifies the flow rate that meets the intent of ECA-1.1, Step 21 RNO, AND the requirements of using ECCS pumps in meeting this flow rate?

REFERENCE PROVIDED

- A. Establish 325 gpm ECCS flow. ECCS pumps are permitted to be started and stopped as necessary to accomplish the desired flow rate.
- B. Establish 325 gpm ECCS flow. ECCS pumps are NOT permitted to be started and stopped as necessary to accomplish the desired flow rate.
- C. Establish 400 gpm ECCS flow. ECCS pumps are permitted to be started and stopped as necessary to accomplish the desired flow rate.
- D. Establish 400 gpm ECCS flow. ECCS pumps are NOT permitted to be started and stopped as necessary to accomplish the desired flow rate.

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *Correct, Between times 0900 - 1030 (90 Min) Using ECA-1.1, curve 9, the value is approximately 325 gpm. The Basis states "the operator is then instructed to establish the minimum ECCS flow needed to match decay heat in order to further decrease ECCS pump Flow and delay RWST depletion. This value of 325 gpm is in the acceptable region using the graph from time of trip AND meets the requirement of Minimum Flow to delay RWST depletion. The procedure states ECCS pumps may be started and stopped as necessary to accomplish the desired flow rate.*

- B. *Incorrect, Plausible since the first part is correct, however the action is not correct. Also plausible if student does not know procedure requirement to start or stop pumps as necessary due to a LOCA. The student may think that due to a LOCA pumps must not be stopped.*

- C. *Incorrect, Plausible due to 400 gpm meets the curve requirement however it does not meet the intent of the step which is to meet the minimum flow requirements while still meeting the curve requirements. Second part is correct in ECCS pumps may be started and stopped as necessary to accomplish the desired flow rate.*

- D. *Incorrect, Plausible due to 400 gpm meeting the curve requirement however it does not meet the intent of the step which is to meet the minimum flow requirements while still meeting the curve requirements. Plausible if student does not know procedure requirement to start or stop pumps as necessary due to a LOCA. The student may think that due to a LOCA pumps must not be stopped.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 17

Tier: 1 **Group** 1

K/A: WE11 Loss of Emergency Coolant Recirculation
EK2.2 Knowledge of the interrelations between the Loss of Emergency Coolant Recirculation and the following:
Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.

Importance Rating: 3.9 / 4.3

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidates determine the minimum required heat transfer flow rate needed to maintain the reactor core in a safe condition and how the ECCS pumps are to be operated to accomplish the required flow rate.

Technical Reference: ECA-1.1 Rev 14

Proposed references to be provided: Provide ECA-1.1 curve 9

Learning Objective: OPL271ECA-1.1, obj. 6

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question developed for Jan 2008 ILT exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

18. W/E12 EK1.3 018

Given the following plant conditions:

- Unit 2 is operating at 100% power.
- A steam line break has occurred in the common header downstream of the MSIVs.
- MSIV's can **NOT** be closed.
- AFW flow has been reduced to 50 gpm per S/G.
- Subsequently, RCS T-hots are rising.

Which ONE of the following is the correct procedural action under these conditions?

- A. Reduce RCS pressure to raise ECCS injection.
- B. Allow the RCS to heat up to prevent a PTS condition.
- C. Raise MDAFW flow to maintain RCS T-hots stable.
- D. Initiate TDAFW pump flow to maintain RCS T-hots stable.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since normally a transition to FR-H.1 would be made, however a Note prior to step 2 directs that if the feed flow capability of 440 gpm or greater is available then a transition to FR-H.1 is not required.*
- B. *Incorrect, Plausible since FR-P.2 will check for RCS temp stable or rising as a condition to exit the procedure, however step 2 of ECA-2.1 requires the operators to stabilize RCS That not let the temperature rise.*
- C. *Correct, In accordance with Step 2 of ECA-2.1 the operators are to stabilize RCS That by raising feed flow or dumping steam. Both MDAFW pumps are available to provide feed flow. With That rising the direction of Step 2.d requires controlling T-hot by raising feed flow or dumping steam.*
- D. *Incorrect, Plausible since if the candidate did not recognize that MDAFW was available then TDAFW would be used to control feed flow. However in a prior step of ECA-2.1 the steam supply valves for the TDAFW pump are closed thus the MDAFW pumps would remain available if needed for feed flow.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 18

Tier: 1 **Group** 1

K/A: W/E12 Steam Line Rupture - Excessive Heat Transfer
EK1.3 Knowledge of the operational implications of the following concepts as they apply to Steam Line Rupture:
Annunciators and conditions indicating signals, and remedial actions associated with the Steam Line Rupture.

Importance Rating: 3.4 /3.7

10 CFR Part 55: 41.8, 41.10

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate determine from the conditions presented the remedial actions necessary to mitigate the steam line rupture event.

Technical Reference: ECA-2.1 rev 11

Proposed references to be provided: None

Learning Objective: OPL271ECA-2.1, Obj 2

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question

Comments:

QUESTIONS REPORT
for 1503 RO Exam

19. 001 AA2.03 019

Given the following plant conditions:

- Unit 1 is operating at 92% power.
- Rod control in AUTO.
- Control bank D rods are at 216 steps.
- Continuous outward rod motion is observed on control bank D.
- The following annunciator has just been received:

ZB-442C BANK D AUTO ROD WITHDRAWAL BLOCKED (1-M4-B, C-7)

Which ONE of the following identifies the **FIRST** action to be taken?

- A✓ Place rod control in MANUAL and verify rod motion stops.
- B. Verify that the reactor protection system and rod control blocks function as designed.
- C. Place rod control in MANUAL and immediately insert control bank D to 216 steps.
- D. Manually trip the reactor and go to E-0, "Reactor Trip or Safety Injection".

DISTRACTOR ANALYSIS:

- A. *Correct, In accordance with AOP-C.01, the operators are to attempt to stop uncontrolled rod motion by placing the rod control selector switch in the Manual position and then verify that rod motion stops.*
- B. *Incorrect, Plausible since the controls are supposed to stop moving out based on the interlock to block bank D withdrawal, it would be logical to just observe that the interlock did stop rod motion. However that is not the direction given in the procedure and is not in keeping with conservative decision making associated with reactivity control.*
- C. *Incorrect, Plausible since this guidance is provided in AOP-C.01 to return the plant to its original stable condition, however its not the first thing that the operators would do to stabilize the plant.*
- D. *Incorrect, Plausible if the candidate thinks that there is an uncontrolled reactivity event in progress and need to terminate power production to maintain the plant in a safe condition. Also this is the guidance given in AOP-C.01 if after taking manual control of the rods the rod motion does not stop. However this in not the first action required to be taken.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 19

Tier: 1 **Group** 2

K/A: 001 Continuous Rod Withdrawal
AA2.03 Ability to determine and interpret the following as they apply to the Continuous Rod Withdrawal:
Proper actions to be taken if automatic safety functions have not taken place.

Importance Rating: 4.5 / 4.8

10 CFR Part 55: 41.10

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidates recall the actions necessary to be taken when main control rods are moving in an uncontrolled manor.

Technical Reference: AOP-C.01 rev 22
1-AR-M4-B rev 30

Proposed references to be provided: None

Learning Objective: OPL271AOPC01, obj. 3

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question AOP-C.01 with C distractor replaced with a plausible answer.

Comments:

QUESTIONS REPORT
for 1503 RO Exam

20. 028 AK3.03 020

Given the following plant conditions:

- Unit 2 was tripped from 100% power.
- The crew is performing a plant cooldown in accordance with ES-0.2 "Natural Circulation Cooldown."
- All steps have been completed up to step 14. INITIATE RCS depressurization.
- The following plant conditions exist:
 - Core exit T/Cs = 520 °F
 - RCS pressure = 1900 psig
- While depressurizing the RCS, a PZR PORV fails OPEN.
- Subsequently the following plant conditions are observed:
 - RCS pressure is 900 psig and stable.
 - Core exit T/Cs remain at 520°F.
 - PZR level is 70% and rising rapidly.

Which ONE of the following completes the statements below?

Current PZR level indication (1) an accurate indication of RCS inventory.

The reason PZR level is rapidly rising is due to (2) .

- A. (1) is
 (2) automatic Safety Injection actuation
- B. (1) is
 (2) drawing a bubble in the reactor vessel head
- C. (1) is NOT
 (2) automatic Safety Injection actuation
- D. (1) is NOT
 (2) drawing a bubble in the reactor vessel head

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if the candidate does not recognize that the RCS is at or near saturated conditions for the reactor vessel upper head and voiding is occurring. Also plausible since the RCS is below the automatic actuation setpoint for Safety Injection and if they did not recognize that Auto SI has been procedurally blocked prior to the depressurization step in ES-0.2.*
- B. *Incorrect, Plausible if the candidate does not recognize that the RCS is at or near saturated conditions for the reactor vessel upper head and voiding is occurring. Also plausible since, the second part is correct.*
- C. *Incorrect, Plausible since the first part is correct. Also plausible since the RCS is below the automatic actuation setpoint for Safety Injection and if they did not recognize that Auto SI has been procedurally blocked prior to the depressurization step in ES-0.2.*
- D. *Correct, With RCS pressure rapidly dropping to near saturation and an associated rapid increase in PZR level would indicate that RCS voiding is occurring which would rapidly force water into the PZR, thus PZR level would not be an accurate indication of total RCS inventory.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 20

Tier: 1 **Group** 1

K/A: 028 Pressurizer Level Control Malfunction
AK3.03 Knowledge of the reasons for the following responses as they apply to Pressurizer Level Control Malfunctions:
False indications of PZR level when PORV or spray valve is open and RCS saturated.

Importance Rating: 3.5 / 4.1

10 CFR Part 55: 41.5/41.7

10CFR55.43.b: Not applicable

K/A Match: This question matches the K/A by having the candidate determine whether the indicated PZR level is accurate based on plant conditions and the reason for the false indication of PZR level.

Technical Reference: ES-0.2 Natural Circulation Cooldown, rev 15
EPM-3-ES-0.2
AOP-I.04 rev 12

Proposed references to be provided: None

Learning Objective: OPL271ES-0.2 Obj 5, 10

Question Source:
New X
Modified Bank
Bank

Question History: New question written for 1503 ILT exam.

Comments:

QUESTIONS REPORT
for 1503 RO Exam

21. 051 AA1.04 021

Given the following plant conditions:

- Unit 1 is operating at 28% power.
- The standby 1C condenser vacuum pump (CVP) starts.
- PS-2-7B CONDENSER VACUUM LOW (1-M2-C, C-6) is DARK
- Condenser pressure is 2.2 psia and stable.

Which ONE of the following completes the statement below?

In accordance with AOP-S.02, "Loss of Condenser Vacuum," as condenser pressure rises to >1.72 psia, the Main Turbine (1) automatically trip.

In accordance with AOP-S.06, "Turbine Trip Below P-9 (50% Power) control rods will be positioned to (2).

- A. (1) will NOT
(2) to stabilize power with $T_{ave} = T_{ref}$
- B✓ (1) will NOT
(2) to stabilize power at $\sim 13 - 15\%$
- C. (1) will
(2) to stabilize power with $T_{ave} = T_{ref}$
- D. (1) will
(2) to stabilize power at $\sim 13 - 15\%$

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible because a manual turbine trip is required if load is < 30% and vacuum > 1.72 psia, however the Main Turbine will not automatically trip until condenser pressure is between 3.9 and 5.4 psia. Also plausible since, in most other procedures, the operators are directed to control Tave = Tref. However, in accordance with AOP-S.06, the operators are to allow the controls to lower in automatic until reactor power is < 20%, then take manual control and maintain power at ~ 13 - 15%.*
- B. *Correct, In accordance with AOP-S.02, if Turbine load is < 30% and condenser vacuum is > 1.72 psia, a manual turbine trip is required but the Main Turbine will not automatically trip until condenser pressure reaches between 3.9 to 5.4 psia. Also in accordance with AOP- S.06, the operators are to take manual control of the rods once power is less than 20% and stabilize reactor power ~ 13 - 15%.*
- C. *Incorrect, Plausible if the candidate thinks that an automatic turbine trip would occur on low condenser vacuum. Also plausible since, in most other procedures, the operators are directed to control Tave = Tref. However, in accordance with AOP-S.06, the operators are to allow the controls to lower in automatic until reactor power is < 20%, then take manual control and maintain power at ~ 13 - 15%.*
- D. *Incorrect, Plausible if the candidate thinks that an automatic turbine trip would occur on low condenser vacuum. Also plausible since, in accordance with AOP-S.06, the second part is correct. The operators are to maintain reactor power ~ 13 - 15%.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 21

Tier: 1 **Group:** 2

K/A: 051 Loss of Condenser Vacuum
AA1.04 Ability to operate and / or monitor the following as they apply to
the Loss of Condenser Vacuum:
Rod position

Importance Rating: 2.5* / 2.5*

10 CFR Part 55: 41.7 / 45.5 / 45.6

10CFR55.43.b: Not applicable

K/A Match: K/A is matched because the question requires the ability to
understand how rod control will be affected during a degraded
condenser vacuum event.

Technical Reference: 1-AR-M2-C, C-6 rev 23
AOP-S.02, rev 13
AOP-S.06, rev 14

**Proposed references
to be provided:** None

Learning Objective: OPL271AOP-S.02
OPL271AOP-S.06

Cognitive Level:

Higher X
Lower

Question Source:

New X
Modified Bank
Bank

Question History: New question for the 03/2015 ILT exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

22. 060 AA1.01 022

Given the following plant conditions:

- Unit 1 and 2 are at 100% power.
- The following high radiation alarm is received:

1-RA-90-1A AUX BLDG AREA RAD MON HIGH RAD (0-M12A, A-7)
- Subsequently, the following alarm is received:

0-RA-90-101A AUX BLDG VENT MONITOR HI RAD (0-M12B, B-1)
- No other rad monitors are in alarm.

Which ONE of the following is a potential cause of the above indication?

- A. Dropped fuel assembly in the SFP
- B. Gas Decay Tank relief valve fails open
- C. Gas Decay Tank pressure indicator sensing line breaks
- D. A 1 gpm RCS leak inside containment with purge in service

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since a dropped fuel assembly could release gaseous radiation into the Aux bldg, however they would cause other monitors to alarm.*
- B. *Incorrect, Plausible since the Gas Decay Tanks are located in the area of the listed rad monitors, however the discharge from a relief valve is directed to the vent header and would not cause the area monitors to alarm.*
- C. *Correct, Flange leak or broken sensing line in the area of the Gas Decay Tanks would cause the CVCS board area monitor to alarm and also then be swept up into the Aux bldg ventilation which would cause the Aux Bldg vent monitor to alarm.*
- D. *Incorrect, Plausible since an RCS leak would cause the Gaseous activity in containment to increase and cause area rad monitors to alarm, however they would be inside Containment. The exhaust would be directed to the Shield bldg exhaust not the Aux bldg exhaust.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 22

Tier: 1 **Group** 2

K/A: 060 Accidental Gaseous Radwaste Release
AA1.01 Ability to operate and/or monitor the following as they apply to
Accidental Gaseous Radwaste Release:
Area rad monitors

Importance Rating: 2.8 / 3.0

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate determine the effect of an Accidental Gaseous Release in the Aux Bldg will have on the area rad monitors in the Aux Bldg.

Technical Reference: 1,2-47W830-4 rev 48
1,2-47W866-10 rev 19

Proposed references to be provided: None

Learning Objective: OPT200.RM
Obj 4 g

Question Source:
New X
Modified Bank
Bank

Question History: New question written for 1503 ILT exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

23. 068 AK2.01 023

Given the following plant conditions:

- The main control room had to be evacuated and the crew is implementing AOP-C.04, "Control Room Inaccessibility."
- The crew is cooling down Unit 1 to Cold Shutdown, in accordance with AOP-C.04, Section 2.1, "Plant Cooldown from Auxiliary Control Room."

Which ONE of the following identifies the 1-L-10 panel indications that can be monitored directly from inside the Aux Control Room, that the crew will use to continuously monitor the cooldown?

- A. Incore T/Cs *SG Press / TSAT*
 T_{HOT} *T_{COLD}*
 RCS subcooling *PZR Pressure*
- B. PZR Pressure *SG Press / TSAT*
 Incore T/Cs *Incore TIC*
 T_{COLD} *PZR pressure*
- C. RCS subcooling
 SG Press/ T_{SAT}
 T_{COLD}
- D. SG Press/ T_{SAT}
 T_{HOT}
 PZR Pressure

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible because these paramaters are listed in ES-0.2, Natural Circulation Cooldown, to monitor RCS cooldown, however Incore T/Cs and RCS subcooling are not directly available in the Aux Control Room. Also Subcooling is determined by using pZR pressure to determine PZR saturation temperature and subtracting the hottest Thot.*

- B. *Incorrect, Plausible because these paramaters are listed in GO-6, Unit Shutdown from Hot Standby to Cold Shutdown, Continuously Monitor Natural Circulation. however Tcold is not directly available in the Aux Control Room (it must be determined from saturation temperature for the given SG Pressure as per Note on page 20 of 97).*

- C. *Incorrect, Plausible because these paramaters are listed in GO-6, Unit Shutdown from Hot Standby to Cold Shutdown, Continuously Monitor Natural Circulation, however RCS subcooling and Tcold are not directly available in the Aux Control Room. Also Subcooling is determined by using PZR pressure to determine pZR saturation temperature and subtracting the hottest Thot.*

- D. *Correct, All three paramaters are directly available in the Aux Control Room. The Main Steam pressure indicator has a T_{sat} corrolation based which can be used to approximate Tcold. All 4 loops of Thot are monitored directly as well as PZR pressure. (Subcooling is determined by using pZR pressure to determine pZR saturation temperature and subtracting the hottest Thot.)*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 23

Tier: 1 **Group** 2

K/A: 068 Control Room Evacuation
AK2.01 Knowledge of the interrelations between Control Room Evacuation
and the following:
Auxiliary shutdown panel layout.

Importance Rating: 3.9 / 4.0

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matches the K/A because it requires the examinee to recall what instrumentation is available in the Aux Control Room (i.e. after MCR is evacuated) for monitoring a natural circulation cooldown.

Technical Reference: AOP-C.04

**Proposed references
to be provided:** None

Learning Objective: OPL271AOP-C.04

Question Source:

New	<u>X</u>
Modified Bank	<u> </u>
Bank	<u> </u>

Question History: New question written for 1503 ILT exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

24. 076 AG2.1.32 024

no Given the following plant conditions:

- Unit 1 is operating at 100% power.
- Chemistry reports that RCS activity level has risen to the Administrative Limit since the last sample.
- The crew enters AOP-R.06, "High RCS Activity."

In accordance with 1-SO-62-9, "CVCS Purification System," which ONE of the following identifies the **MAXIMUM** flow that can be established through the CVCS Mixed Bed ion exchanger and how the flow will be controlled through the Cation Bed with the current plant conditions?

	<u>Maximum Flow Through Mix Bed</u>	<u>Cation Bed Flow Control</u>
A.	120 gpm	throttling the outlet valve
B✓	120 gpm	throttling the bypass valve
C.	180 gpm	throttling the outlet valve
D.	180 gpm	throttling the bypass valve

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since the first part is correct. Also plausible since throttling the outlet valve is the way that many other flow rates are controlled.*
- B. *Correct, In accordance with AOP-R.06, mixed beds are to be placed in service in accordance with 1,2-SO-62-9, CVCS Purification System. Precaution and limitation B.2 limits the Mixed bed ion exchanger flow rate to between 20 and 120 gpm when in modes 1 - 4. Also in accordance with 1-SO-62-9 when placing the Cation bed in service the flowrate is limited to 72 gpm by throttling the cation bed bypass valve in the closed direction.*
- C. *Incorrect, Plausible if the candidate gets the maximum flow confused for current plant conditions with the maximum flow during Modes 5 or 6. The limit in those modes is 180 gpm. Also plausible since throttling the outlet valve is the way that many other flow rates are controlled.*
- D. *Incorrect, Plausible if the candidate gets the maximum flow confused for current plant conditions with the maximum flow during Modes 5 or 6. The limit in those modes is 180 gpm. Also plausible since the second part is correct.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 24

Tier: 1 **Group** 2

K/A: 076 High Reactor Coolant Activity
AG 2.1.32 Ability to explain and apply all system limits and precautions.

Importance Rating: 3.8 / 4.0

10 CFR Part 55: 41.10

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate apply precaution and limitations to the operation of CVCS ion exchangers during a High RCS Activity event.

Technical Reference: AOP-R.06 rev 12
1-SO-62-9, rev 46

Proposed references to be provided: None

Learning Objective: OPT200.CVCS obj. 6, obj 11

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question

Comments:

QUESTIONS REPORT
for 1503 RO Exam

25. W/E08 EK1.2 025

Given the following plant conditions:

- Unit 1 reactor tripped from 100% power due to a LOCA.
- The crew is performing the actions of FR-P.1, "Pressurized Thermal Shock."
- Conditions can **NOT** be established to terminate SI flow.
- RCS subcooling is 50°F and stable.

Which ONE of the following identifies the basis for starting a RCP at this time?

Starting a RCP will

- A. reduce the thermal stress on the Rx vessel.
- B. eliminate the need to perform a 1 hour soak of the RCS.
- C. reduce the minimum required subcooling to terminate SI.
- D. prevent Rx vessel head voiding as RCS pressure is reduced.

DISTRACTOR ANALYSIS:

- A. *Correct, Starting an RCP results in mixing the warmer water flow from the RCP with the colder ECCS flow, creating a warmer combined flow entering the beltline region of the reactor vessel downcomer which can reduce the stress on the vessel.*
- B. *Incorrect, Plausible if the candidate thinks that by starting an RCP that the mixing will cause the need to soak the RCS temperature for an hour to be not required since flow mixing is occurring, however when in FR-P.1, if a Tcold temperature has decreased greater than 100 °F in less than 60 minutes then a soak is required. (regardless of whether a RCP is running or not)*
- C. *Incorrect, Plausible since subcooling is considered when performing FR-P.1, but the higher subcooling number is to determine if SI should be terminated (>90°F subcooling) vs 40°F required to start a RCP. Also plausible since minimizing subcooling when starting a RCP is correct for other procedures.*
- D. *Incorrect, Plausible since having an RCP running it would be less likely to potentially draw a bubble in the Rx vessel head, but it is not assured.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 25

Tier: 1 **Group** 2

K/A: W/E08 RCS Overcooling - Pressurized Thermal Shock (PTS)
EK1.2 Knowledge of the operational implications of the following concepts as they apply to Pressurized Thermal Shock:
Normal, abnormal and emergency operating procedures associated with (Natural Circulation Operations),

Importance Rating: 3.4 / 4.0

10 CFR Part 55: 41.8 / 41.10

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate determine the operational significance of starting an RCP during conditions of Pressurized Thermal Shock.

Technical Reference: FR-P.1, rev 14
EPM-3-FR-P.1 Basis document rev 5

Proposed references to be provided: None

Learning Objective: OPL271FR-P.1

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question

Comments:

QUESTIONS REPORT
for 1503 RO Exam

26. W/E10 EA2.2 026

Given the following plant conditions:

- Unit 2 Reactor trip occurred with subsequent loss of RCPs.
- Operators have implemented ES-0.2, "Natural Circulation Cooldown."
- A cooldown rate of 25°F/hour has been established.
- RCS depressurization has been initiated.
- The Shift Manager has determined that cooldown shall proceed as quickly as possible due to reduced CST inventory.

Which ONE of the following identifies the procedure that maximizes the allowable cooldown rate for the provided circumstances and maximum cooldown rate allowed by the procedure?

- A. ES-0.2, "Natural Circulation Cooldown"
The cooldown limit is 50°F/hr
- B. ES-0.2, "Natural Circulation Cooldown"
The cooldown limit is 100°F/hr
- C. ES-0.3, "Natural Circulation Cooldown With Steam Voids in Vessel (with RVLIS)"
The cooldown limit is 50°F/hr
- D. ES-0.3, "Natural Circulation Cooldown With Steam Voids in Vessel (with RVLIS)"
The cooldown limit is 100°F/hr

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if student does not remember a transition point to ES-0.3 due to need for cooldown due to low CST inventory and cooldown rate limits for the procedures. Cooldown limit of 50 °F/hr is the normal cooldown limit on natural circulation however, ES-0.3 allows up to 100 °F/hr*
- B. *Incorrect, Plausible if student does not remember a transition point to ES-0.3 due to need for cooldown due to low CST inventory and cooldown rate limits for the procedures. Cooldown limit of 50 °F/hr is the normal cooldown limit on natural circulation however, ES-0.3 allows up to 100 °F/hr*
- C. *Incorrect, Plausible if student does remember a transition point to ES-0.3 due to SM decision to proceed as quickly as possible due to a condition such as CST inventory and student does not know cooldown rate limit ES-0.3. 50 °F/hr is the normal cooldown limit on natural circulation and ES-0.3 allows up to 100 °F/hr*
- D. *Correct, The SM decision to proceed as quickly as possible due to a condition such as CST inventory requires transition to ES-0.3 "Natural Circulation Cooldown - With Steam Void in Vessel (with RVLIS). ES-0.3 limits cooldown to 100 °F/hr.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 26

Tier: 1 **Group** 2

K/A: W/E10 Natural Circulation with Steam Void in the Rx Vessel with/without RVLIS
EA2.2 Ability to determine and interpret the following as they apply to Natural Circulation with Steam Void in Rx Vessel with/without RVLIS:
Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

Importance Rating: 3.4 / 3.9

10 CFR Part 55: 41.10

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate determine the procedure which has an overall mitigation strategy of cooling down at the maximum rate and recalling what the maximum rate allowed.

Technical Reference: ES-0.2 Rev 15
ES-0.3 rev 14

Proposed references to be provided: None

Learning Objective: OPL271ES-0.3

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question used on 1/2008 exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

27. W/E15 EK3.1 027

Given the following plant conditions:

- Large Break LOCA is in progress on Unit 2.
- Containment pressure is 1.9 psig and stable.
- The STA reports an ORANGE condition on the CONTAINMENT (FR-Z) Safety Function Status Tree due to high level in the containment sump.

Which ONE of the following...

(1) describes the action(s) that will be directed by FR-Z.2, "Containment Flooding,"

and

(2) what is the concern if these actions are not successful?

- A. (1) Divert RHR flow from the Containment Sump to the RWST.
(2) Components needed for plant recovery could be damaged and rendered inoperable.
- B. (1) Identify and isolate the source of excess water and determine its quality.
(2) Water reaching the bottom of the reactor vessel could result in thermal shock and vessel failure.
- C. (1) Identify and isolate the source of excess water and determine its quality.
(2) Components needed for plant recovery could be damaged and rendered inoperable.
- D. (1) Divert RHR flow from the Containment Sump to the RWST.
(2) Water reaching the bottom of the reactor vessel could result in thermal shock and vessel failure.

QUESTIONS REPORT
for 1503 RO Exam

Containment design basis flood level takes into account the entire water contents of the RCS, RWST, Ice condenser ice bed melt, and SI accumulators, plus the added mass of a LOCA and a steam line or feedline break inside containment. ERCW and CCW may be major contributors to exceeding "flood" level and causing a loss of equipment required for long term cooling.

DISTRACTOR ANALYSIS:

- A. *Incorrect. Plausible however excess water is not pumped out of containment using the RHR pumps.*
- B. *Incorrect, Plausible since if the flooding gets severe enough, the colder water reaching the Reactor vessel could possibly would not cause thermal shock or vessel failure.*
- C. *Correct, In accordance with EPM-3-FR-Z.2, the source of the excess water is to be identified and isolated as quickly as possible. The quality of the water is needed to be known to determine were the excess water can be transferred.*
- D. *Incorrect, Water is not pumped out of containment using the RHR pumps. Water reaching the Reactor vessel would not cause thermal shock or vessel failure.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 27

Tier: 1 **Group** 2

K/A: WE15 Containment Flooding
EK3.1 Knowledge of the reasons for the following concepts as they apply to Containment Flooding:
Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics.

Importance Rating: 2.7 / 2.9

10 CFR Part 55: 41.7 / 45.7

10CFR55.43.b: Not applicable

K/A Match: This question matches the K/A by having the candidate determine the actions necessary to mitigate a High CNMT sump condition and the reason that a high CNMT sump condition could be detrimental to the Unit.

Technical Reference: FR-Z.2, Containment Flooding, Rev 7
EPM-3-FR-Z.2 rev 3

Proposed references to be provided: None

Learning Objective: OPL271FR-Z.2

Cognitive Level:

Higher _____
Lower X

Question Source:

New _____
Modified Bank _____
Bank X

Question History: Used on 05/2009 audit.

Comments: Modified

QUESTIONS REPORT
for 1503 RO Exam

28. 003 K5.04 028

Given the following plant conditions:

- Unit 1 is at 30% power.
- Loop 3 RCP trips.

Which ONE of the following describes how steam flow and water level in Loop 3 S/G initially responds to the RCP trip?

INITIALLY, Loop 3 S/G steam flow (1) and level (2) .

- A✓ (1) lowers
 (2) lowers
- B. (1) lowers
 (2) rises
- C. (1) rises
 (2) lowers
- D. (1) rises
 (2) rises

DISTRACTOR ANALYSIS:

- A. *Correct, The S/G with the tripped RCP will essentially stop steaming, thus the steam flow will decrease and S/G level will also immediately decrease due to shrink.*
- B. *Incorrect, Plausible since steam flow in S/G #3 will decrease, however S/G level will also decrease due to shrink.*
- C. *Incorrect, Plausible if the candidate thought that the pressure would drop in S/G #3. Also plausible since the second part is correct.*
- D. *Incorrect, Plausible if the candidate thought that the pressure would drop in S/G #3, which in-turn caused level to increase due to swell.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 28

Tier: 2 **Group** 1

K/A: 003 Reactor Coolant Pump
K5.04 Knowledge of the operational implications of the following concepts as they apply to the RCPs:
Effects of RCP shutdown on secondary parameters, such as steam pressure, steam flow, and feed flow.

Importance Rating: 3.2 / 3.5

10 CFR Part 55: 41.5

10CFR55.43.b: not applicable

K/A Match: This question matches the K/A by determining if the candidate knows the effect an RCP trip will have on SG parameters (steam flow and SG level) when the plant is at power.

Technical Reference: AOP-R.04, Step 2.1 Caution

Proposed references to be provided: None

Learning Objective: OPL271AOP-R.04, obj. 6

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: Bank question from 2009 Commanche Peak NRC exam, SQN ILT 1211, SQN ILT 1311 Audit

Comments: Shuffled answers for SQN ILT 1311 Audit

QUESTIONS REPORT
for 1503 RO Exam

29. 004 G2.4.31 029

Given the following plant conditions:

- Unit 1 is operating at 100% power.
- LS-62-129A/B VOLUME CONTROL TANK LEVEL HI-LOW, alarms on (1-M-6, A-3)
- LI-62-129, VCT Level, indicates 35% lowering.
- LI-62-130, VCT Level, indicates 100% on ICS.

Which ONE of the following identifies the effect on the plant?

- A. Suction to the operating CCP will align to the RWST when VCT level lowers to 7%.
- B. Pressurizer level will lower to 17% resulting in letdown system isolation and recovery of VCT level.
- C. VCT level will continue to lower until the operator manually aligns LCV-62-118, Letdown Divert to HUT, to the VCT position.
- D. Auto makeup will initiate to the VCT when LT-62-129, VCT Level Transmitter, lowers to 20% and will raise VCT level back to 41%.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if candidate does not know that failure of LT-62-129 or 130 will prevent swapover to RWST.*
- B. *Incorrect, Plausible if candidate thinks that failure will cause charging flow control valve to go to minimum. If that occurred then PZR level would decrease to 17%.*
- C. *Correct, VCT level will continue to drop, since a failure of LT-62-130 will prevent Auto makeup and auto swapover to RWST. Operators must take manual control of Divert valve and select to VCT position.*
- D. *Incorrect, Plausible if candidate thinks that Auto makeup will occur and maintain VCT level above swap-over value. Auto makeup is not available for this condition.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 29

Tier: 2 **Group** 1

K/A: 004 Chemical and Volume Control System
G 2.4.31 Knowledge of annunciators alarms, indications or response procedures.

Importance Rating: 4.2 / 4.1

10 CFR Part 55: 41.10

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate determine the effect on VCT makeup with a level detector failed and the required operator action to mitigate the failure based on the annunciator response procedure.

Technical Reference: 1-AR-M6-C A-3, Rev 43

Proposed references to be provided: None

Learning Objective: OPT200.CVCS Obj 3

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question

Comments:

QUESTIONS REPORT
for 1503 RO Exam

30. 004 K2.03 030

Given the following plant conditions:

- Unit 1 is in Mode 3 performing a plant shutdown
- Both Unit 1 USSTs are out of service
- An electrical fault occurs which results in a loss of the 1A Start Bus

Which ONE of the following identifies (1) the pump that lost power and (2) if the pump will start if power is restored?

- | <u>(1)</u> | <u>(2)</u> |
|--|-----------------------|
| A. 1A-A CCP | will start |
| B. 1A-A CCP | will NOT start |
| <input checked="" type="radio"/> C. 1B-B CCP | will start |
| D. 1B-B CCP | will NOT start |

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if the candidate thinks that 1A Start Bus feeds the 1A-A Shutdown board. However the 1A-A Shutdown board is supplied by 1B Start Bus. Also the second part is correct.*
- B. *Incorrect, Plausible if the candidate thinks that 1A Start Bus feeds the 1A-A Shutdown board. However the 1A-A Shutdown board is supplied by 1B Start Bus. Also plausible since other ECCS pumps will not start when power is restored unless there is an SI signal present.*
- C. *Correct, The 1A Start bus is the normal power supply to the 1B-B Shutdown Board, thus 1B-B CCP would lose power. Also the CCPs will restart when power is restored to the SDBD.*
- D. *Correct, Plausible since the first part is correct, the 1A Start bus is the normal power supply to the 1B-B Shutdown Board. Also plausible since other ECCS pumps will not start when power is restored unless there is an SI signal present.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 30

Tier: 2 **Group** 1

K/A: 004 Chemical and Volume Control System (CVCS)
K2.03 Knowledge of the bus power supplies to the following:
Charging pumps

Importance Rating: 3.3 / 3.5

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate determine the power supply for the charging pumps and whether the equipment would restart following a restoration of power with out having an SI signal present.

Technical Reference: AOP-P.05 Loss of Unit 1 Shutdown Boards rev 23
TI-28 Attach 9
1,2-1E500-1 rev 41

Proposed references to be provided: None

Learning Objective: OPT200.AC6.9 KV obj. 5
OPT200.CVCS obj. 5

Question Source:

New	<u> X </u>
Modified Bank	<u> </u>
Bank	<u> </u>

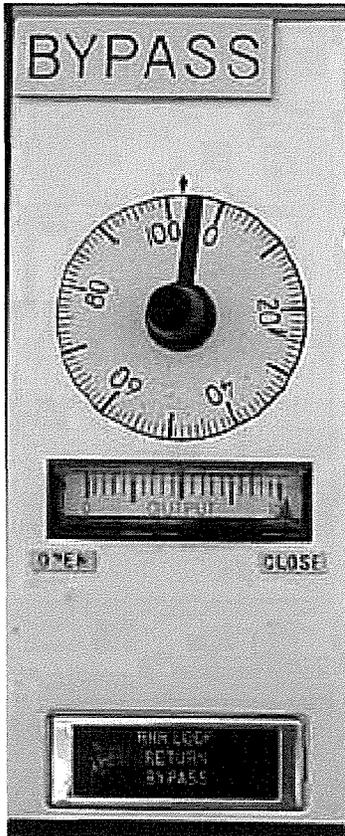
Question History: New question written for 1503 exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

31. Given the following plant conditions:

- Unit 1 is in Mode 4 on RHR with a cooldown to Mode 5 in progress.
- Both trains of RHR are in service.
- The flow is 2500 gpm per train.
- RCS cooldown rate is 25°F/hr.
- The OAC turns the dial for 1-HIC-74-32A, RHR Hx Bypass Flow Controller, from 20% to 40%.



Assuming NO other operator action is taken, which ONE of the following identifies the effect on RCS cooldown rate and on total indicated RHR system flow?

	<u>RCS Cooldown Rate</u>	<u>Indicated RHR Flow</u>
A.	Rises	Remains Constant
B✓	Rises	Lowers
C.	Lowers	Remains Constant
D.	Lowers	Lowers

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since the first part is correct, less bypass flow will cause cooldown rate to increase. Also plausible if the candidate thinks that total system flow will remain constant when the bypass is closed down, since other systems are controlled with that scheme (total system flow remains constant as Hx are bypassed or placed in service). However the outlet valves are manually adjusted and unless manually repositioned, system flow would go down.*
- B. *Correct, The Hx bypass valve is an air operated valve which requires air pressure to close the valve, thus increasing the demand on the controller will cause more air to the valve which causes the bypass valve to close down. This will cause less flow to bypass the Hx, thus cooldown rate will increase. Also since the Hx valves are manually positioned and the sensing line is downstream of where the bypass and Hx outlet come together, by closing the bypass valve less system flow will be seen so indicated flow will decrease.*
- C. *Incorrect, Plausible if the candidate thinks that by changing the controller position from 20% to 40% causes the Hx bypass valve to go open, this would cause more bypass flow and less cooldown. Also if they think the bypass opens then more system flow would be indicated.*
- D. *Incorrect, Plausible if the candidate thinks that by changing the controller position from 20% to 40% causes the Hx bypass valve to go open, this would cause more bypass flow and less cooldown. Also plausible if the candidate thinks that total system flow will remain constant when the bypass is opened, since other systems are controlled with that scheme (total system flow remains constant as Hx are bypassed or placed in service). However the outlet valves are manually adjusted and unless manually repositioned, system flow would go down.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 31

Tier: 2 **Group** 1

K/A: 005 Residual Heat Removal System (RHR)
K4.03 Knowledge of RHR design feature(s) and/or interlock(s) which
provide for the following:
RHR heat exchanger bypass flow control

Importance Rating: 2.9 / 3.2

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate identify the design feature of the RHR Hx bypass flow control valve and how adjustments of the bypass valve effect RCS cooldown rate and system flow.

Technical Reference: 47W610-74-1
0-SO-74-1 rev 94

Proposed references to be provided: None

Learning Objective: OPT200.RHR. Obj. 8.a

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question

Comments:

QUESTIONS REPORT
for 1503 RO Exam

32. 006 K2.01 032

Given the following plant conditions:

- Unit 2 is at 100% power.
- An automatic reactor trip and safety injection occur.
- Concurrent with the reactor trip, the 2B 6.9Kv Unit Board de-energizes due to a differential fault.

Which ONE of the following completes the statement below?

The (1) RHR pump is load shed and it will restart (2) after the DG ties to the affected 6.9Kv SDBD.

- | <u>(1)</u> | <u>(2)</u> |
|------------|------------|
| A. 2A-A | 5 secs |
| B. 2A-A | 10 secs |
| C. 2B-B | 5 secs |
| D. 2B-B | 10 secs |

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since the first part is correct. Also plausible since 5 secs is a start time for an ECCS pump, however SI pumps start at 5 secs and RHR pumps start at 10 secs.*
- B. *Correct, The 2B 6.9Kv Unit board is the normal power supply to the 2A-A Shutdown Board, thus 2A-A RHR would lose power. Also the RHR pump will restart after a 10 sec time delay when power is restored to the SDBD.*
- C. *Incorrect, Plausible if the candidate thinks that the 2B 6.9Kv Unit board is the normal power supply to the 2B-B Shutdown Board, thus they would think that 2B-B RHR would lose power. Also plausible since 5 secs is a start time for an ECCS pump, however SI pumps start at 5 secs and RHR pumps start at 10 secs.*
- D. *Incorrect, Plausible if the candidate thinks that the 2B 6.9Kv Unit board is the normal power supply to the 2B-B Shutdown Board, thus they would think that 2B-B RHR would lose power. Also plausible since the second part is correct.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 32

Tier: 2 **Group** 1

K/A: 006 Emergency Core Cooling System (ECCS)
K2.01 Knowledge of the bus power supplies to the following:
ECCS pumps

Importance Rating: 3.6 / 3.9

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate determine the power supply to each of ECCS pumps and whether the equipment would restart following a restoration of power with an SI signal present.

Technical Reference: TI-28 Attach 9
1,2-1E500-1 rev 41
1,2-45N765-13 rev 20

Proposed references to be provided: None

Learning Objective: OPT200.ECCS obj. 6

Question Source:

New	<u> X </u>
Modified Bank	<u> </u>
Bank	<u> </u>

Question History: New question written for 1503 exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

33. 007 A3.01 033

Which ONE of the following identifies the pressure that relief valve 63-637, "RHR Pump Discharge," will start relieving and the tank where the flow through the valve will be routed?

<u>Pressure</u>	<u>Tank</u>
A. 550 psig	RCDT
B. 550 psig	PRT
C. 600 psig	RCDT
D. 600 psig	PRT

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible because 550 psig is the maximum RHR pump discharge pressure allowed to be maintained in accordance with the System Operating Instruction when RHR system is in service and the RCDT is an RCS tank inside containment (like the PRT) which does receive flow and leakoffs from RCS related components.*
- B. *Incorrect, Plausible because 550 psig is the maximum RHR pump discharge pressure allowed to be maintained in accordance with the System Operating Instruction when RHR system is in service and the PRT being the tank that receives flow passing through the valve is correct.*
- C. *Incorrect, Plausible because 600 psig is the pressure that the valve starts relieving and the RCDT is an RCS tank inside containment (like the PRT) which does receive flow and leakoffs from RCS related components.*
- D. *Correct, the RHR discharge relief valve, 63-637, starts relieving at 600 psig and is routed to the PRT.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 33

Tier: 2 **Group** 1

K/A: 007 Pressurizer Relief Tank/Quench Tank System (PRTS)
A3.01 Ability to monitor automatic operation of the PRTS, including:
Components which discharge to the PRT

Importance Rating: 2.7 /2.9

10 CFR Part 55: 41.7 / 45.5 to 45.8

10CFR55.43.b: Not applicable

K/A Match: K/A is matched because the question requires the ability to monitor the automatic operation of the RHR discharge pressure and PRT level to know if the relief valve is relieving (which did occur at SQN allowing approximately 10,000 gallons to be passed to the PRT prior to termination)

Technical Reference: 1-47W811-1 R74
0-47W813-1 R55
1-SO-74-1, Residual Heat Removal System, rev 0094

Proposed references to be provided: None

Learning Objective: **OPT200.RHR**
18. STATE the RHR design pressure and flow capacities.
OPT200.PRT
19. LIST the components that discharge to the PRT

Cognitive Level:
Higher _____
Lower X

Question Source:
New _____
Modified Bank _____
Bank X

Question History: WBN bank question 007A3.01 33 used on the WBN 06/2011 NRC exam and SQN 1305 NRC exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

34. 008 A1.01 034

Given the following conditions:

- Both Units are at 100% power.
- SFP temperature has risen 4°F over the last 2 shifts.
- SFP HX A is in service with:
 - 2600 gpm SFPC flow, and
 - 2300 gpm CCS flow

Which ONE of the following completes the statement below?

To stabilize SFP temperatures, the crew will raise (1) flow to SFP HX A, and the flow will be limited to **NO** more than (2) .

- | | <u> (1) </u> | <u> (2) </u> |
|----|--------------|--------------|
| A✓ | CCS | 3300 gpm |
| B. | CCS | 3500 gpm |
| C. | SFPC | 3300 gpm |
| D. | SFPC | 3500 gpm |

DISTRACTOR ANALYSIS:

- A. *Correct, In accordance with 0-SO-78-1 SFPC system, the upper limit of flow for the SFPC system is 2600 gpm, thus to increase the cooling of the SFP the CCS system flow will need to be adjusted. Also Limitation B, indicates that the CCS flow is limited to no more than 3300 gpm to avoid potential HX tube vibration.*
- B. *Incorrect, Plausible since the first part is correct. Also plausible if the candidate gets the CCS system flow confused with the CCS pump flow which should be maintained \geq 3500 gpm, vs the SFP HX flow rate.*
- C. *Incorrect, Plausible since there are steps in the procedure for throttling SFPC flow and the candidate may think that SFPC system flow could be adjusted to increase the cooling of the SF Pit, however the SFPC system flow rate is already at the maximum allowed by procedure. Also plausible since the flow rate value in the second part is correct.*
- D. *Incorrect, Plausible that the candidate may think that SFPC system flow could be adjusted to increase the cooling of the SFP, however the SFPC system flow rate is already at the maximum allowed by procedure. Also plausible if the candidate gets the maximum flow confused with the CCS system flow rate.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 34

Tier: 2 **Group** 1

K/A: 008 Component Cooling Water System (CCW)
A1.01 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating CCWS controls including:
CCW flow rate.

Importance Rating: 2.8 / 2.9

10 CFR Part 55: 41.5

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate determine the actions necessary to throttle CCW (CCS) flow to provide additional cooling to the SFPC HX and also determine the maximum flowrate that can be established to prevent possible equipment damage.

Technical Reference: 1-SO-70-1 rev 55
0-SO-78-1 rev 67
2-PI-OPS-000-023.1 rev 77

Proposed references to be provided: None

Learning Objective: OPT200.CCS obj. 12

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question

Comments: Original question was 033 G2.4.46 with the question reworded and answers changed.

QUESTIONS REPORT
for 1503 RO Exam

35. 010 K4.01 035

Given the following plant conditions:

- Unit 1 is in Mode 3.
- RCS Tavg is 547°F and pressurizer pressure is 2235 psig.

Which ONE of the following would result in annunciator 'TS-68-316, 317 PRESSURIZER SPRAY LINES TEMP LOW,' (1-M5-A,) being actuated?

- A. RCP # 3 Trips
- B. RCS Tavg dropping to 534°F
- C. Auxiliary Spray is placed in service
- D. Pressurizer pressure dropping to 1900 psig

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since the alarm could be caused by an idle loop, however only loop 1 or 2 would affect the PZR spray flow not loop #3.*
- B. *Correct, In accordance with 1-AR-M5-A, C-2, this alarm would be caused by placing Auxiliary Spray in service since CVCS temperature would be less than the alarm setpoint of 510°F.*
- C. *Incorrect, Plausible since the alarm could be caused by operator action during Unit cooldown in Modes 3, 4, & 5 however the alarm does not come in until 510°F.*
- D. *Incorrect, Plausible if the candidate thinks that the alarm is associated with the saturation temperature of the PZR, however this temperature would remain much greater than 510°F for a pressure of 1900 psig.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 35

Tier: 2 **Group** 1

K/A: 010 Pressurizer Pressure Control System (PZR PCS)
K4.01 Knowledge of PZR PCS design feature(s) and/or interlock(s) which provide for the following:
Spray valve warm-up

Importance Rating: 2.7 / 2.9

10 CFR Part 55: 41.7

10CFR55.43.b: Not applicable

K/A Match: This question matches the K/A by having the candidate determine which of the actions provided would not provide sufficient flow to maintain the PZR Spray valve above its required warmup limit.

Technical Reference: 1-AR-M5-A C-2 rev 39

Proposed references to be provided: None

Learning Objective: OPT200.PZR-PRT obj. 7

Question Source:

New	<u> </u>
Modified Bank	<u> X </u>
Bank	<u> </u>

Question History: Bank question with modification to stem and 2 distractors. Also changed correct answer from D to C

Comments:

QUESTIONS REPORT
for 1503 RO Exam

36. 012 K3.01 036

Given the following plant conditions:

- Unit 1 is at 100% power.
- MIG is performing the Monthly Functional Test of Train 'A' SSPS.
- BYA (Train A bypass breaker) is racked **in** and **closed**.
- RTA (Train A reactor trip breaker) is racked **in** and **closed**.
- RTB (Train B reactor trip breaker) is racked **in** and **closed**.

- Subsequently, One 48 Vdc power supply to Unit 1 'B' train SSPS fails.

Which ONE of the following identifies the effect this failure will have on the breakers?

- A. RTA, RTB, and BYA Open
- B. RTA, RTB and BYA all remain Closed
- C. RTA and BYA Open; RTB remains Closed
- D. RTA and BYA remain Closed; RTB Opens

DISTRACTOR ANALYSIS:

- A. *Correct, Racking in and closing BYA generates a Train A general warning. The loss of 48Vdc power supply will result in a Train B general warning. A general warning occurring on both trains of SSPS simultaneously will cause an automatic reactor trip signal to be generated in both trains of SSPS. RTB and BYA will receive a trip signal from Train B SSPS. RTA will receive a trip signal from Train A SSPS. Train B SSPS will still function with the loss of one of the two redundant 48Vdc power supplies in the logic cabinet.*
- B. *Incorrect, Plausible if the candidate not realize that the loss of 48Vdc power supply will cause a B train General Warning, thus a reactor trip signal will be sent to both trains of SSPS. With an A train General Warning already present due to racking in and closing BYA, this failure will generate a reactor trip on both trains of SSPS.*
- C. *Incorrect, Plausible since a General Warning exists in A train of SSPS the candidate may think that the General Warning for the loss of 48Vdc power supply will only effect Train A since 2 general warnings now exist and the logic will be made to cause a trip. However the General Warning caused by the failure of the 48Vdc power supply is for Train B but the logic for a trip is a General Warning for trains simultaneously will cause a trip of both trains of SSPS.*
- D. *Incorrect, Plausible since RTB will receive a trip signal. However the candidate may not realize that the loss of 48Vdc caused a B train General Warning. Also, the UV coil on RTB is supplied by 48Vdc. The candidate may think that the loss of one redundant 48Vdc power supply will drop out the RTB UV coil.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 36

Tier: 2 **Group** 1

K/A: 012 Reactor Protection System (RPS)
K3.01 Knowledge of the effect that a loss or malfunction of the RPS will have on the following:
CRDS

Importance Rating: 3.9 / 4.0

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate determine the effect of a malfunction within the RPS has on the power supply to the Control Rod Drive System supply breakers.

Technical Reference: 1-SI-IFT-099-90.8A Reactor Trip Instrumentation
Monthly Functional Test (SSPS) Train A rev 26
45N699-1
47W611-99-1
1-AR-M6-A rev 16

Proposed references to be provided: None

Learning Objective: OPT200RPS obj. 4

Question Source:

New	<u> X </u>
Modified Bank	<u> </u>
Bank	<u> </u>

Question History: New question written for 1503 ILT exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

37. 013 K1.06 037

Given the following plant conditions:

- A Large break LOCA has occurred on Unit 1.
- **"B" train** Safety Injection signal failed to actuate both Automatically and Manually.
- The following alarms are LIT:

LS-63-176 CNTMT LEVEL HI RHR RECIRC, (M6-C, E-4)

LS-63-50A RWST LVL LO, (M6-E, E-3)

- RWST level indications are reported as:
 - LT-63-50: Off scale High
 - LT-63-51: 26%
 - LT-63-52: 28%
 - LT-63-53: 26%

Which ONE of the following identifies the expected condition of 1-FCV-63-72, "CNTMT SUMP SUCT TO RHR PUMP 1A" and 1-FCV-63-73, "CNTMT SUMP SUCT TO RHR PUMP 1B," assuming **NO** operator action?

- A. 1-FCV-63-72 will be opening and 1-FCV-63-73 will remain closed.
- B. 1-FCV-63-72 will remain closed and 1-FCV-63-73 will be opening.
- C. 1-FCV-63-72 and 1-FCV-63-73 will both remain closed.
- D. 1-FCV-63-72 and 1-FCV-63-73 will both be opening.

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *Correct, With the RWST level at <27% on 2/4 channels an automatic CNTMT sump swap over will occur. However with a failed SI signal on the B train the 1-FCV-63-73 will not have an open signal and thus will remain closed, while the A train valve will open.*

- B. *Incorrect, Plausible if the candidate gets the valves confused for A train vs B train since the A train valve is 63-72 (an even number, but A train) and 63-73 (an odd number, but B train) are not normal configuration for odd vs even for train identifiers.*

- C. *Incorrect, Plausible that the candidate could confuse the logic for CNTMT sump swapover with other permissives that require 3/4 signals to cause actuation or reset. With one channel failed high and one level above the setpoint the candidate could determine that sump swapover may not occur thus neither valve would open.*

- D. *Incorrect, Plausible that the candidate could determine that CNTMT sump swapover would occur and that just like many other ESF pieces of equipment either train actuation will cause the function to occur (such as TDAFW, EDG)*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 37

Tier: 2 **Group** 1

K/A: 013 Engineered Safety Features Actuation (ESFAS)
K1.06 Knowledge of the physical connections and/or cause effect
relationship between ESFAS and the following systems:
ECCS

Importance Rating: 4.2 / 4.4

10 CFR Part 55: 41.2 to 41.9

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate determine the effect of a failed ESFAS signal on the ECCS valves associated with CNMT sump swapper during an emergency condition.

Technical Reference: 1-AR-M6-C Rev 43
1-AR-M6-E Rev 29
47W611-88-1
47W611-63-1

Proposed references to be provided: None

Learning Objective: OPT200.ECCS obj. 5

Question Source:

New	<u> </u>
Modified Bank	<u> X </u>
Bank	<u> </u>

Question History: SQN bank question stem data changed from B train RPS to B train ESFAS and changed answer from D to A

Comments:

QUESTIONS REPORT
for 1503 RO Exam

38. 013 K2.01 038

Given the following plant conditions:

- Unit 1 is at 100% power
- A loss of 120V AC Vital Instrument Power Board 1-III has occurred
- Subsequently, an SI occurs on Unit 1

Which ONE of the following identifies the plant response?

- A. Only the "B" train SSPS SI master relays would actuate AND both trains of ECCS equipment would start.
- B. Only the "B" train SSPS SI master relays would actuate AND only "B" train ECCS equipment would start.
- C. SI master relays on both trains of SSPS would actuate AND both trains of ECCS equipment would start.
- D. SI master relays on both trains of SSPS would actuate AND only "B" train ECCS equipment would start.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if the candidate gets the Unit 1 and Unit 2 power supplies confused. Unit 1 uses I & II, while Unit 2 uses III & IV thus if they think Unit 1 is like Unit 2 then, and do not recall that the power to the Master Relays are auctioneered then only the "B" train SSPS would have power (bus IV). Also plausible since the second part is correct.*
- B. *Incorrect, Plausible if the candidate gets the Unit 1 and Unit 2 power supplies confused. Unit 1 uses I & II, while Unit 2 uses III & IV thus if they think Unit 1 is like Unit 2 then, and do not recall that the power to the Master Relays are auctioneered then only the "B" train SSPS would have power (bus IV). Also plausible if the candidate gets the power supply to the Slave relays confused with U-2, since channel III power would be lost to Train A equipment and only Train B equipment would start on Unit 2 for this power configuration.*
- C. *Correct, The SSPS SI Master Relays on both trains will have power since they are supplied with an auctionneering. Train A uses bus I (normal) and bus III (alternate) and Train B uses bus II (normal) and bus IV (alternate). Independantly both trains of Slave relays are will have power, channel I powers Train A and channel II powers train B. Thus both trains of SI equipment will start.*
- D. *Incorrect, Plausible since the first part is correct, Master Relays on both trains will have power. Also plausible if the candidate gets the power supplies to the Slave relays confused with Unit 2 since this would be true if on Unit 2.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 38

Tier: 2 **Group** 1

K/A: 013 Engineered Safety Features Actuation System (ESFAS)
K2.01 Knowledge of the bus power supplies to the following:
ESFAS/Safeguards equipment control

Importance Rating: 3.6 / 3.8

10 CFR Part 55: 41.7

10CFR55.43.b: Not applicable

K/A Match: This question matches the K/A by testing the candidates knowledge of the power supplies for individual channels and the effect a loss of a power supply will have on the associated ESFAS channel signals.

Technical Reference: 47W611-63-1 Rev 4
AOP-P.03 Rev 26

Proposed references to be provided: None

Learning Objective: OPT200.RPS Obj 4.a; Obj. 5

Question Source:

New	<u> </u>
Modified Bank	<u> X </u>
Bank	<u> </u>

Question History: Used on the 1201 ILT NRC Exam, ILT 1311 NRC Exam

Comments: Created a modified bank question by changing the instrument channel that fails in the stem and changing the answer from "D" to "C"

QUESTIONS REPORT
for 1503 RO Exam

39. 022 A2.03 039

Given the following plant conditions:

- Unit 1 is at 100% power.
- The following alarm is received:

MOTOR TRIP OUT PNL 1-M-9 (M6E-E5)

- The RO determines that Lower Compartment Cooling Fan 1B-B control switch WHITE light is LIT.
- Fans 1C-A and 1A-A are running.

Which ONE of the following describes the primary concern related to this failure, and the procedural actions required?

- A. Lower Ice Condenser doors may open due to high DP;
Stop one Upper Compartment Cooling fan to equalize pressure in accordance with the alarm response procedures.
- B. Lower Ice Condenser doors may open due to high DP;
Start any Lower Compartment Cooling fan in standby using the alarm response and 0-SO-30-5, Lower Compartment Cooling.
- C. PZR Enclosure may heat up and cause PZR Safety Valves to leak;
Isolate the tripped cooler TCV and bypass the in-service Lower Compartment Cooler TCVs to increase cooling to the PZR Enclosure in accordance with the alarm response procedures.
- D. PZR Enclosure may heat up and cause PZR Safety Valves to leak;
Start any Lower Compartment Cooling fan in standby using the alarm response and 0-SO-30-5, Lower Compartment Cooling.

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since containment DP is a concern for the other ventilation systems such as purge, or an event such as a LOCA.*
- B. *Incorrect, Plausible since containment DP is a concern for the other ventilation systems such as purge, or an event such as a LOCA. Also the action to start a fan in correct.*
- C. *Incorrect, Plausible since the first part is correct, also plausible since the TCV for the tripped fan is allowed to go open.*
- D. *Correct, In accordance with a Note in the Alarm Response and a Note in 0-SO-30-5 if a containment fan trips the operators are to monitor parameters closely due to the possible effect of increasing temperature in the PZR enclosure. Also with only three fans running initially then one will be in standby and available to start.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 39

Tier: 2 **Group** 1

K/A: 022 Containment Cooling System
A2.03 Ability to (a) predict the impacts of the following malfunctions or operations on CNMT Cooling system and (b) based on those predictions use procedures to correct, control or mitigate the consequences of those malfunctions or operations:
Fan motor thermal overload/high-speed operation

Importance Rating: 2.6 / 3.0

10 CFR Part 55: 41.5

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate recall the effect of CNMT cooling fan trip during normal plant operation on other equipment located inside CNMT.

Technical Reference: AR-M6E, E5
0-SO-30-5

Proposed references to be provided: None

Learning Objective: OPT200.CONTCOOLING Obj. 9

Question Source:
New _____
Modified Bank _____
Bank X

Question History: SQN bank question

Comments:

QUESTIONS REPORT
for 1503 RO Exam

40. 022 K3.02 040

Given the following plant conditions:

- Unit 2 is operating at 100% power.
- Due to a loss of Lower Compartment Cooling, lower containment temperature has risen from 105°F to 125°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 will indicate (1) than actual due to reference leg density (2) .

- A. (1) higher
 (2) lowering
- B. (1) higher
 (2) rising
- C. (1) lower
 (2) lowering
- D. (1) lower
 (2) rising

DISTRACTOR ANALYSIS:

- A. *Correct, When the lower 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.*
- B. *Incorrect, The controlling level channel will indicate higher than actual level. Plausible if the effects of the temperature rise and relationship with the density affect on the reference leg are reversed.*
- C. *Incorrect, Plausible if the effects of the temperature rise and relationship with the density affect on the reference leg are reversed. Also plausible since the second part is correct.*
- D. *Incorrect, The controlling level channel will indicate higher than actual. Plausible if the effect of the temperature rise on the reference leg is reversed.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 40

Tier: 2 **Group** 1

K/A: 022 Containment Cooling System
K3.02 Knowledge of the effect that a loss or malfunction of the CCS will have on the following:
Containment instrumentation readings

Importance Rating: 3.0 / 3.2

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate identify the effects of changing CNMT temperature on PZR level instrumentation which is located inside CNMT.

Technical Reference: BWR -PWR Chapter 7-Sensors and Detectors
-July-2011

Proposed references to be provided: None

Learning Objective: OPT200.CNTMTCLG&PURGE obj. 9

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u>X</u>

Question History: Bank question from 2006 Braidwood exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

41. 025 K6.01 041

Given the following plant conditions:

- Unit 1 is in Mode 3
- Three (3) Ice Condenser INLET Doors are found to be frozen shut.

Which ONE of the following completes the statements below?

LCO 3.6.5.3, "Ice Condenser Door," (1) require entering a 1 hour Tech Spec action entry.

The concern with having INLET doors frozen shut is (2).

- A. (1) will
(2) excessive sublimation occurring in the ice bed
- B. (1) will
(2) an inlet flow maldistribution may occur for very small accidents
- C. (1) will **NOT**
(2) excessive sublimation occurring in the ice bed
- D. (1) will **NOT**
(2) an inlet flow maldistribution may occur for very small accidents

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since the first part is correct. A 1 hour action applies to the ice condenser inlet doors as identified in Tech Spec. 3.6.5.3 Action a. Also plausible since excess sublimation is a concern for ice bed operation but is associated with ice bed temperature not door operability.*
- B. *Correct, If the Inlet doors are incapable of opening, a one hour action is required to restore the doors to operable status. Also, per the FSAR, the purpose of the flow proportioning springs and ice doors opening evenly ensures an even distribution of flow through the ice beds.*
Incorrect, The 1 hour action applies to the ice condenser inlet doors as identified in Tech Spec. 3.6.5.3 Action a. but the intermediate deck doors are not equipped with flow proportioning springs. Plausible because the inlet door are subject to the action and the candidate could reverse the designation of the doors with springs.
- C. *Incorrect, Plausible since Tech Spec. 3.6.5.3 Action "a" 1 hour action does not apply to the intermediate deck doors or upper doors, it applies only to the ice condenser inlet doors. Also the intermediate doors are subject to other Tech Spec action. Also plausible since excess sublimation is a concern for ice bed operation but is associated with ice bed temperature not door operability.*
- D. *Incorrect, Plausible since Tech Spec. 3.6.5.3 Action "a" 1 hour action does not apply to the intermediate deck doors or upper doors, it applies only to the ice condenser inlet doors. Also the intermediate doors are subject to other Tech Spec action. Also plausible since the second part is correct.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 41

Tier: 2 **Group** 1

K/A: 025 Ice Condenser System
K6.01 Knowledge of the effect of a loss or malfunction of the following will have on the ice condenser system:
Upper and lower doors of the ice condenser

Importance Rating: 3.4* / 3.6*

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate recall the specific Ice Condenser doors which are required by Tech Specs and the design of the ice condenser doors which contribute to design of the Ice Condenser system to limit CNMT pressure during design accidents.

Technical Reference: Technical Specification 3.6.5.3 Amendment 277
FSAR chapt 6.5.9

Proposed references to be provided: None

Learning Objective: OPT200.ICE obj. 1

Question Source:

New	<u> X </u>
Modified Bank	<u> </u>
Bank	<u> </u>

Question History: New question written for 1503 NRC exam.

Comments:

QUESTIONS REPORT
for 1503 RO Exam

42. 026 A4.05 042

Given the following plant conditions:

- Unit 1 is at 100% power
- Subsequently, a LOCA occurs
- Containment pressure peaked at 3.0 psig
- Current containment pressure is 1.8 psig and stable

Which ONE of the following identifies the **MINIMUM** action(s) necessary to allow 1B-B Containment Spray Pump to be stopped and prevent it from automatically re-starting?

- A. Reset the Train B Phase B signal and then the Train B Containment Spray signal
- B. Reset the Train B Containment Spray signal **ONLY**
- C. Simultaneously Reset BOTH Trains of Phase B
- D. Reset the Train B Phase B **ONLY**

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since the setpoint for Phase B and CNMT spray is at the same value that the candidate would think that a Phase B signal would cause a CNMT spray actuation. However Phase B is independant of CNMT spray.*
- B. *Correct, In accordance with ES-1.3 when removing Containment Spray pumps from service the operators are directed to Reset just the CNMT spray actuation signal for the train that will be secured, Thus the minimum action would be to reset just CNMT actuation Phase B to secure the B CNMT spray pump.*
- C. *Incorrect, Plausible if the candidate thinks that the reset logic is the same as the initiation logic which requiries the operator to use 2 hands for CNMT spray actuation.*
- D. *Incorrect, Plausible that the candidate would think that by resetting the Phase B signal that it would allow the Train B CNMT spray pump to be shutdown and remain off since the setpoint for Phase B is the same as CNMT Spray.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 42

Tier: 2 **Group** 1

K/A: 026 Containment Spray System
A4.05 Ability to operate and/or monitor in the control room:
Containment spray reset switches

Importance Rating: 3.5 / 3.5

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by asking the how the logic for CNMT spray reset is configured and how the reset is accomplished.

Technical Reference: 47W611-72-1
47W611-88-1

Proposed references to be provided: None

Learning Objective: OPT200.CS obj

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question

Comments:

QUESTIONS REPORT
for 1503 RO Exam

43. 039 A3.02 043

Given the following plant conditions:

- A plant cooldown is in progress on Unit 2.
- RCS pressure is 1850 psig.
- RCS temperature is 505°F.
- All required actions have been taken for the cooldown in accordance with 0-GO-7, "Unit Shutdown From Hot Standby To Cold Shutdown."

An event occurs:

- RCS pressure is 1700 psig and lowering at 10 psi per second.
- SG pressures are 700 psig and lowering at 25 psi per second.
- Containment pressure is 1.2 psig and rising.

Which ONE of the following describes the current ESF actuation status?

- A. Safety Injection AND Main Steam Line Isolation have occurred.
- B. Safety Injection has occurred; Main Steam Line Isolation has NOT occurred.
- C. Main Steam Line Isolation has occurred; Safety Injection has NOT occurred.
- D. NEITHER Main Steam Isolation NOR Safety Injection have occurred.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if the candidate does not recall that SI and MSLI have been both been blocked by actions within 0-GO-7 for a normal plant cooldown.*
- B. *Incorrect, Plausible if the candidate does not recall that the Low pressure SI is blocked by actions in 0-GO-7 before RCS pressure is reduced to approx 1920 psig, thus SI and MSLI would be blocked in the stem.*
- C. *Correct, Since SI was blocked as part of the normal plant cooldown in 0-GO-7 when RCS pressure is approx 1920 psig, and the SI would not actuate due to low Steam Line pressure of 600 psig. However even though the Main Steam Line Isolation is blocked, the Steam Line Pressure Negative rate of change (100 psi change in 50 secs) setpoint is not blocked and would be active. Thus MSLI would occur and SI would be blocked.*
- D. *Incorrect, Plausible if the candidate recalls that both Low RCS pressure SI and Low Steamline Pressure SI and MSLI are blocked due a normal cooldown and forgets that the Main Steamline Neg Rate signal is still active.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 43

Tier: 2 **Group** 1

K/A: 039 Main and Reheat Steam System (MRSS)
A3.02 Ability to monitor automatic operation of the MRSS, including:
Isolation of the MRSS

Importance Rating: 3.1 / 3.5

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate determine if automatic MRSS isolation should occur based on the given parameters.

Technical Reference: TI-28 Attachment 9
47W611-63-1
0-GO-7

Proposed references to be provided: None

Learning Objective: OPT200.RPS; obj. 4

Question Source:
New _____
Modified Bank _____
Bank X

Question History: SQN bank question

Comments:

QUESTIONS REPORT
for 1503 RO Exam

44. 059 A1.07 044

Given the following plant conditions:

- Unit 1 is at 100% power.
- Main Steam Header Pressure transmitter, 1-PT-1-33B is in **BYPASS**.
- Subsequently, Main Steam Header Pressure transmitter, 1-PT-1-33A fails low.

Which ONE of the following completes the statement below?

The main feed pump master speed controller will _____ (1) _____ manual and the operator will need to adjust _____ (2) _____.

- A. (1) automatically shift to
(2) main feed reg valves to restore affected S/Gs to program level
- B. (1) automatically shift to
(2) speed on the master controller to restore feedwater pressure to ~1040 psig
- C. (1) be placed in
(2) main feed reg valves to restore affected S/Gs to program level
- D. (1) be placed in
(2) speed on the master controller to restore feedwater pressure to ~1040 psig

DISTRACTOR ANALYSIS:

- A. *Incorrect: The first part is correct. The second part is plausible as other failures (such as SG level failures) cause the MFW reg valves to shift to auto and level in the SGs would be controlled by adjusting the valves in manual.*
- B. *Correct: failure of 2/3 main steam header transmitters will cause the MFW pump master controller to shift to manual. AOP-S.01 has the operator control speed of the MFW pump to ~ 1040 psig to adequately restore SG level.*
- C. *Incorrect: Plausible if examinee does not understand that the controller will shift to manual automatically on a 2/3 failure. Some DCS circuits will shift from median select to average on one channel failure and from average to last good signal on 2 failures and shift to auto on 3 failures. The second part is plausible as other failures (such as SG level failures) cause the MFW reg valves to shift to auto and level in the SGs would be controlled by adjusting the valves in manual.*
- D. *Plausible if examinee does not understand that the controller will shift to manual automatically on a 2/3 failure. Some DCS circuits will shift from median select to average on one channel failure and from average to last good signal on 2 failures and shift to auto on 3 failures. The second part is correct.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 44

Tier: 2 **Group** 1

K/A: 059 Main Feedwater System
K4.05 Knowledge of MFW design feature(s) and/or interlock(s) which provide for the following:
Control of speed of MFW pump turbine

Importance Rating: 2.5*/2.8*

10 CFR Part 55: 41.7

10CFR55.43.b: not applicable

K/A Match: This question matches the K/A by having the candidate identify the effect of a failed transmitter on the speed control of a MFP and the actions necessary to mitigate the effects of the failure.

Technical Reference: 1-SO-98-1, Distributed Control System
AOP-S.01, Loss of Normal Feedwater

Proposed references to be provided: None

Learning Objective: OPT200.MFW obj. 1.k; 10.c; 12.c

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN ILT 1305 Auit

Comments:

QUESTIONS REPORT
for 1503 RO Exam

45. 059 G2.4.11 045

Given the following plant conditions:

- Unit 1 is holding at 70% power.
- 1C Condensate Booster pump is tagged for maintenance.
- Subsequently the 1B MFW pump trips.

Which ONE of the following completes the statement below?

The 1B MFW pump turbine condenser inlet and outlet valves (1).

and

In accordance with AOP-S.01, "Loss of Normal Feedwater," the crew (2).

- A✓ (1) automatically isolate
(2) must reduce turbine load to maintain power less than 55% power.
- B. (1) automatically isolate
(2) will **NOT** have to reduce load any further since below 72% power.
- C. (1) do **NOT** automatically isolate
(2) must reduce turbine load to maintain power less than 55% power.
- D. (1) do **NOT** automatically isolate
(2) will **NOT** have to reduce load any further since below 72% power.

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *Correct, In accordance with AOP-S.01, if Reactor power is greater than 60%, if a MFW pump trips the MFW pump turbine condenser isolation valves will go closed. Also per AOP-S.01 if there are less than 3 condensate booster pumps in service (3rd pump is started approx 85% power) the operators are directed to reduce power to less than 55% to prevent overloading the remaining feedwater supply.*
- B. *Incorrect, Plausible since the first part is correct. Also plausible since the normally at 100% power the plant would run back or the crew is directed to runback the plant to 72% power. Since the plant is already below that value, the operators could get the this setpoint confused.*
- C. *Incorrect, Plausible if the candidate does recall the setpoint at which the MFW pump turbine condenser isolates. In accordance with AOP-S.01, if Reactor power is greater than 60%, if a MFW pump trips the MFW pump turbine condenser isolation valves will go closed. Also the second part is correct in accordance with AOP-S.01.*
- D. *Incorrect, Plausible if the candidate does recall the setpoint at which the MFW pump turbine condenser isolates. In accordance with AOP-S.01, if Reactor power is greater than 60%, if a MFW pump trips the MFW pump turbine condenser isolation valves will go closed. Also plausible since normally at 100% power the plant would run back or the crew is directed to runback the plant to 72% power. Since the plant is already below that value, the operators could get this setpoint confused.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 45

Tier: 2 **Group** 1

K/A: 059 Main Feedwater System
G2.4.11 Knowledge of Abnormal Condition procedures.

Importance Rating: 4.0 /4.2

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate recall the response of the MFW pump condenser valves based on current power level and the actions required by AOP-S.01 for a trip of a MFW pump at power.

Technical Reference: AOP-S.01 Loss of Normal Feedwater rev 21

Proposed references to be provided: None

Learning Objective: OPL271AOP-S.01

Question Source:

New	<u> X </u>
Modified Bank	<u> </u>
Bank	<u> </u>

Question History: New question written for 1503 ILT exam

Comments:

SQN	MAIN FEEDWATER MALFUNCTIONS	AOP-S.01 Rev. 21
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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<p>2.4 Main Feedwater Pump Trip Below 76% (U-1) or 77% (U-2) Turbine Load</p>		
<p>1. MONITOR at least one MFW pump RUNNING.</p>	<p>IF reactor power is greater than AFW flow capability (~ 3%), THEN TRIP reactor and GO TO E-0, <i>Reactor Trip or Safety Injection.</i></p> <p style="text-align: center;"></p> <p>IF reactor power less than or equal to AFW flow capability (~ 3%), THEN PERFORM the following:</p> <ul style="list-style-type: none"> a. ENSURE main turbine TRIPPED. b. ENSURE AFW Pumps RUNNING. c. CONTROL S/G levels at ~ 33% USING AFW flow. d. ENSURE reactor power stable. e. DISPATCH operator to investigate MFW pump trip. f. GO TO Caution prior to Step 11. <p style="text-align: center;"></p>	

QUESTIONS REPORT
for 1503 RO Exam

46. 061 K5.02 046

Given the following plant conditions:

- 0800 - Unit 2 has tripped from 100% power due to a loss of offsite power.
- 0830 - DGs 2A-A and 2B-B both trip and can **NOT** be started.
 - An AUO has been dispatched to locally control the TDAFW pump.

- 0930 - The AUO reports that TDAFW pump suction pressure has reached the criteria for swapping the suction supply to ERCW.

Given the current plant conditions, which ONE of the following identifies...

(1) where the ERCW suction valves for Unit 2 TDAFW pump can be opened
and

(2) the **MINIMUM** required AFW flow at this time?

REFERENCE PROVIDED

- A. (1) MCR and locally
(2) 240 gpm

- B. (1) MCR and locally
(2) 270 gpm

- C✓ (1) local ONLY
(2) 240 gpm

- D. (1) local ONLY
(2) 270 gpm

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if the candidate thinks that the ERCW valves are DC powered valves vs. AC powered valves and could be opened from the MCR, however since there is no power to operate the valves then Local action would be the only way to open the ERCW valves. Also plausible since the second part is correct, at 1.5 hrs after the trip then ~240 gpm would be the minimum flow required.*
- B. *Incorrect, Plausible if the candidate thinks that the ERCW valves are DC powered valves vs. AC powered valves and could be opened from the MCR, however since there is no power to operate the valves then Local action would be the only way to open the ERCW valves. Also plausible if the candidate thinks that the time clock starts when ECA-0.0 is entered not when the Reactor Trips, thus since the time since ECA-0.0 had been entered was only 1 hour then ~ 270 gpm would be the minimum required flow.*
- C. *Correct, In accordance with ECA-0.0 since there would be no power available to open the suction valves from the MCR, then local action would be the only way to open the ERCW suction valves. Also in accordance with EA-3-7 Appendix C the required AFW flow for 1.5 hours after the trip would be 240 gpm, since the AFW flow listed on the graph is the minimum flow to remove decay but not cause an overfill condition.*
- D. *Incorrect, Plausible since the first part is correct. Also plausible if the candidate thinks that the time clock starts when ECA-0.0 is entered not when the Reactor Trips, thus since the time since ECA-0.0 had been entered was only 1 hour then ~ 270 gpm would be the minimum required flow.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 46

Tier: 2 **Group** 1

K/A: 061 Auxiliary / Emergency Feedwater (AFW) System
K5.02 Knowledge of the operational implications of the following concepts as they apply to the AFW:
Decay heat sources and magnitude

Importance Rating: 3.2 / 3.6

10 CFR Part 55: 41.5

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate determine the required AFW flow to support a secondary heat sink at different times after a reactor trip.

Technical Reference: ECA-0.0 rev 26
EA-3-7 graph of AFW flow vs time after shutdown rev 9

Proposed references to be provided: EA-3-7, Appendix C rev 9 with Notes 1 and 2 redacted

Learning Objective: OPL271ECA-0.0

Question Source:

New	<u> X </u>
Modified Bank	<u> </u>
Bank	<u> </u>

Question History: New question written for 1503 ILT exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

47. 061 K6.02 047

Given the following plant conditions:

- Unit 2 is in Mode 1.
- The TDAFW Pump is tagged out of service.
- A Loss of Feedwater causes a reactor trip.
- Concurrent with the trip, 2B-B 6.9kV SDBD de-energizes on Differential fault.

Assuming **NO** operator actions have been taken, which ONE of the following describes the Auxiliary Feedwater alignment and approximate flowrate?

- A. 1 and 2 SGs being fed at 220 GPM each
- B. 1 and 2 SGs being fed at 440 GPM each
- C. ALL SGs being fed at 110 GPM each
- D. ALL SGs being fed at 220 GPM each

DISTRACTOR ANALYSIS:

- A. *Correct, With a loss of 2B-B SD Board, Only A MDAFW Pump is available. It has a capacity of 440 GPM, and it is aligned to automatically feed 1 and 2 SGs. Thus approximately 220 gpm to each SG.*
- B. *Incorrect, Plausible, since the alignment is correct, however the capacity (440 gpm) is the capacity of the Turbine driven pump, not the motor driven.*
- C. *Incorrect, Plausible if the candidate does not realize that only the A MDAFW is available and it only provides flow to SGs 1 & 2. The capacity would be correct if only one MD AFW pump was running and supplying all 4 SGs.*
- D. *Incorrect, Plausible if the candidate does not realize that 2B-B SDBD will not be re-energized by the EDG, thus only the "A" MDAFW is available and it only provides flow to SGs 1 & 2. The capacity would be correct if the candidate gets the flow of the TD AFW pump confused with the MD AFW pump and supplying all 4 SGs.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 47

Tier: 2 **Group** 1

K/A: 061 Auxiliary / Emergency Feedwater (AFW) System
K6.02 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

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate determine the effect that a loss of AFW pumps will have during an accident.

Technical Reference: 1,2-45N765-6
1,2-47W803-2

Proposed references to be provided: None

Learning Objective: OPT200.AFW obj 1.a, b; 7.a

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question used on Sept 2010 exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

48. 062 G2.2.39 048

Given the following plant conditions:

- Both units operating at 100% power
- At 0200, the weekly performance of 0-SI-OPS-082-007.W, "AC Electrical Power Source Operability Verification," is completed

- 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

- At 0902:
 - All shutdown boards are at normal voltage
 - All EDGs are running
 - SELD reports that the grid remains QUALIFIED

Which ONE of the following completes the statements below?

(1) The requirements of LCO 3.8.1.1 AC Sources, (1) met.

(2) 0-SI-OPS-082-007.W (2) be required to be performed within 1 hour.

- A. (1) are
 (2) will
- B. (1) are
 (2) will NOT
- C✓ (1) are NOT
 (2) will
- D. (1) are NOT
 (2) will NOT

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since the candidate could miss the requirement to enter T.S 3.8.1.1 actions. Additionally T.S.3.8.1.1 requires that 0-SI-OPS-082-007.W be performed within 1 hr when only one source of offsite is inoperable.*

- B. *Incorrect, Plausible since the first part is correct. Also plausible that since the pervious crew had performed 0-SI-OPS-082-007.W within the last 8 hrs that the candidate may conclude that the surveillance does not need to be performed again at this time.*

- C. *Correct, Voltage less than 80% (5520v) on any 6.9kV Shutdown Board will cause all 4 EDGs to start via the common emergency start relay and additionally the A train EDGs would tie onto their associated shutdown boards. Thus 1 offsite power supply is inoperable and T/S 3.8.1.1 actions are required. Additionally T.S.3.8.1.1 requires that 0-SI-OPS-082-007.W be performed within 1 hr.*

- D. *Incorrect, Plausible since the candidate could miss the requirement to perform the 1hr LCO action. Also plausible since the previous crew had performed 0-SI-OPS-082-007.W within the last 8 hrs the candidate may conclude that the surveillance does not need to be performed again at this time. Also the candidate could determine that both trains of offsite power are inoperable. This condition would not require the 0-SI-OPS-082-007.W to be performed.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 48

Tier: 2 **Group** 1

K/A: 062 AC Electrical Distribution
G2.2.39 Knowledge of less than one hour technical specification action statements for systems.

Importance Rating: 3.9 / 4.5

10 CFR Part 55: 41.7 / 41.10

10CFR55.43.b: n/a

K/A Match: The question matches the KA because it requires the applicant to know required TS lineups for loss of offsite power and required 1hr or less action statements.

Technical Reference: Unit 1 Technical Specifications 3.8.1.1,
AOP-P.07, rev 5
0-SI-OPS-082-007.W rev 39

Proposed references to be provided: None

Learning Objective: OPT200.SWYD 7 & 11

Question Source:

New	<u> X </u>
Modified Bank	<u> </u>
Bank	<u> </u>

Question History: New Question written for 1503 IL T exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

49. 063 K1.03 049

Given the following plant conditions:

- Units 1 and 2 are operating at 100% power.
- Offsite power is lost.
- 1A-A and 2B-B diesel generators start and load.
- 1B-B and 2A-A diesel generators do **NOT** start.
- **NO** operator action has yet been taken.

Which ONE of the following describes the effect of this failure on the 125V DC system?

- A. ALL Vital boards are energized by their associated battery.
- B. Vital boards I and IV are energized by their battery.
- C. Vital boards II and III are energized by their battery.
- D. All vital 125V DC boards are energized from a battery charger powered from an operating diesel.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if the candidate gets the Loss of Offsite power confused with the Loss of All AC (ECA-0.0) since the loss of all AC has actions for the operators to rapidly reduce the loads on the the battery bus to extend the life of the batteries.*
- B. *Incorrect, Plausible if the candidate gets the power supplies to the DC boards confused and thinks that Board II would be powered from 2B-B and Board III would be powered from 1A-A.*
- C. *Correct, With the 1A-A EDG supplying its associated bus then Battery charger I is powered from the 1-A Shutdown Board and with 2B-B EDG powering its associated bus then Battery Charger 4 is powered from bus 2-B Shutdown Board. Battery chargers II and III would not be powered from their normal source and the batteries would be powering those DC buses.*
- D. *Incorrect, Plausible if the candidate thinks that Battery Charger I & III would be powered from an 'A' train EDG and chargers II & IV would be powered from a 'B' train EDG.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 49

Tier: 2 **Group** 1

K/A: 063 DC Electrical Distribution
K1.03 Knowledge of the physical connections and/or cause effect relationship between DC Electrical Distribution system and the following systems:
Battery charger and battery

Importance Rating: 2.9 / 3.5

10 CFR Part 55: 41.5

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate recall the emergency power supply for the Battery Chargers and which DC loads will be powered from the battery during a Loss of Offsite Power.

Technical Reference: 1,2-45N700-1

Proposed references to be provided: None

Learning Objective: OPT200.DC obj. 4, 5

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question

Comments:

QUESTIONS REPORT
for 1503 RO Exam

50. 064 K1.02 050

Given the following plant conditions:

- Both Units are at 100% power.
- A loss of off-site power occurs

Which ONE of the following completes the statement below?

The Jacket Cooling water flow for each EDG will be initiated when the EDG (1)
and the EDG (2) trip if the High Jacket Water Temp Alarm is received.

- A. (1) starts
 (2) will
- B. (1) starts
 (2) will **NOT**
- C. (1) reaches 200 rpm
 (2) will
- D. (1) reaches 200 rpm
 (2) will **NOT**

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since the first part is correct. Also plausible if the candidate does not recognize that an emergency start (whether manually initiated or in an emergency) will bypass the high jacket water temperature trip, thus the EDG will not trip on high temperature.*

- B. *Correct, The Jacket cooling water pump is a shaft driven pump and thus will start when the EDG starts. Also when the EDG is started in Emergency the jacket water high temp will not cause an automatic trip of the EDG.*

- C. *Incorrect, Plausible if the candidate does not recognize that the jacket cooling water pump is a shaft driven pump and thinks that the pump will start at 200 rpm since there are other actions that occur at 200 rpm increasing, (such as setpoint for air start motors, muffler room exhaust fan starts). Also plausible if the candidate does not recognize that an emergency start (whether manually initiated or in an emergency) will bypass the high jacket water temperature trip, thus the EDG will not trip on high temperature.*

- D. *Incorrect, Plausible if the candidate does not recognize that the jacket cooling water pump is a shaft driven pump and thinks that the pump will start at 200 rpm since there are other actions that occur at 200 rpm increasing, (such as setpoint for air start motors, muffler room exhaust fan starts). Also plausible since the second part is correct.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 50

Tier: 2 **Group** 1

K/A: 064 Emergency Diesel Generator (EDG)
K1.02 Knowledge of the physical connections and/or cause effect relationship between EDG and the following systems:
D/G cooling water system

Importance Rating: 3.1 / 3.6

10 CFR Part 55: 41.5

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate recall the interface of Jacket cooling water and the EDGs and how the high temperature condition will affect the EDG.

Technical Reference: 0-SO-82-1 rev 48
0-AR-M26A-C-4 rev 35

Proposed references to be provided: None

Learning Objective: OPT200.DG obj. 1.c; 6.d

Question Source:

New	<u>X</u>
Modified Bank	<u> </u>
Bank	<u> </u>

Question History: New question written for 1503 ILT exam.

Comments:

QUESTIONS REPORT
for 1503 RO Exam

51. 073 K3.01 051

Given the following plant conditions:

- Unit 1 is operating at 100% power.
- Annunciator 1-RA-120A/121A STM GEN BLDN LIQ SAMP MON HI RAD (0-M12-A, B-5) is in alarm.
- The indicator for 1-RM-90-120 is reading pegged high and the red light is LIT.
- **NO** other radiation monitor reads abnormally.
- 1-RM-90-121 responds properly to a source check.

Which ONE of the following identifies the actions to take under these conditions?

- A✓ Ensure 1-FCV-15-44 closed to stop blowdown flow. Notify Chemistry. If monitor has failed, place pink off-normal tags.
- B. Ensure 1-FCV-15-44 closed to stop blowdown flow. Entry into AOP-R.01, "Steam Generator Tube Leak", is required.
- C. Since 1-RM-90-121 is reading normally blowdown should not have isolated. Notify Chemistry. If monitor has failed, place pink off-normal tags.
- D. Since 1-RM-90-121 is reading normally blowdown should not have isolated. Entry into AOP-R.01, "Steam Generator Tube Leak", is required.

DISTRACTOR ANALYSIS:

- A. *Correct, Either 120 or 121 will isolate SGBD via 1-FCV-44. Per ARP, the crew ensures SGBD is isolated, validate alarm. Alarm is not valid since the parrallel RM is not in alarm and source checks. If alarm is not valid, then place an equipment inop or off normal tag.*
- B. *Incorrect, Plausible since the first action is required, however entry in to the AOP-R.01 is only required if for a valid RM alarm not just for a single alarm with no other indications.*
- C. *Incorrect, Plausible since either of the two monitors can cause blowdown to isolate and if the candidate thinks that both 120 and 121 monitors are in service in parallel operation, however normally only monitor is aligned at any one time and with 120 aligned as per the question stem it does not take both in alarm to cause an isolation.*
- D. *Incorrect, Plausible since either of the two monitors can cause blowdown to isolate and if the candidate thinks that both 120 and 121 monitors are in service in parallel operation, however normally only monitor is aligned at any one time. Also entry into AOP-R.01 is only required if there is a valid (backed up by sample) High Rad alarm.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 51

Tier: 2 **Group** 1

K/A: 073 Process Radiation Monitoring
K3.01 Knowledge of the effect that a loss or malfunction of the PRM system will have on the following:
Radioactive effluent releases

Importance Rating: 3.6 / 4.2

10 CFR Part 55: 41.7

10CFR55.43.b: not applicable

K/A Match: This question matches the K/A by having the candidate determine the affect on the effluent release (SG Blowdown) with a failed rad monitor in alarm.

Technical Reference: 0-AR-M12-A B-5

Proposed references to be provided: None

Learning Objective: OPT200.SGBD, Obj. 1.g & h; 5.c

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question, SQN ILT 1211, SQN ILT 1311 Audit

Comments:

QUESTIONS REPORT
for 1503 RO Exam

52. 076 A3.02 052

Given the following plant conditions:

- Both Units are at 100% power
- An inadvertent SI occurs on Unit 2

Which ONE of the following identifies the expected ERCW system response?

- A. ERCW to the lower compartment coolers receive a CLOSE signal.
- B. ERCW supply valves to DGs receive an OPEN signal.
- C. ERCW to incore instrument room coolers receive a CLOSE signal.
- D. ERCW to CNTMT Spray Heat Exchangers receive an OPEN signal.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if the candidates get the isolation signal confused since the ERCW valves for the lower coolers do receive a close signal but only when phase B signal is present not a phase A which could be initiated by the inadvertent SI.*
- B. *Correct, The ERCW to the EDGs all receive an OPEN signal when either unit has an SI actuation. These valves then stroke open to supply cooling water to the EDGs.*
- C. *Incorrect, Plausible if the candidate gets the isolation signals confused since the chill water and the Incore coolers trip on a phase A which is initiated by an SI signal, however the ERCW valves are not affected by these trip signals.*
- D. *Incorrect, Plausible since this a required ERCW alignment for safe guards equipment using EA-67-1, however this is a manual alignment not an automatic alignment for heat removal.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 52

Tier: 2 **Group** 1

K/A: 076 Service Water System:
A3.02 Ability to monitor automatic operation of the Service Water System,
including:
Emergency Heat Loads.

Importance Rating: 3.7 / 3.7

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate recall the emergency heat loads that will be serviced by ERCW during an event in which SI as been actuated.

Technical Reference: 45N771 sheet 1 rev 23
45N767 sheet 3 rev 24
45N767 sheet 5 rev 20

Proposed references to be provided: None

Learning Objective: OPT200. ERCW obj. 6

Question Source:

New	<u>X</u>
Modified Bank	_____
Bank	_____

Question History: New question written for 1503 ILT exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

53. 076 K4.03 053

Given the following plant conditions:

- Unit 1 was at 100% power when a manual SI is initiated.

Which ONE of the following identifies the automatic response of the ERCW system?

1-FCV-67-146, "CCS Hx 1A1 and 1A2 ERCW Return to Header B" (1) and
0-FCV-67-152, "CCS HXs 0B1 and 0B2 Discharge to B Discharge Header" (2).

- A. (1) CLOSES
(2) REPOSITIONS to 35% position
- B. (1) remains AS IS
(2) remains CLOSED
- C. (1) remains AS IS
(2) REPOSITIONS to 35% position
- D. (1) OPENS fully
(2) remains CLOSED

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible based on the misconception that 1-FCV-67-146, **CLOSES** and 0-FCV-67-152 **OPENS** to 35% position would provide for opening the outlet which allows more cooling for additional SI component heat loads.*
- B. *Incorrect, Plausible if candidate thinks that maintaining status quo, 1-FCV-67-146 and 0-FCV-67-152 remaining in their normal conditions, unchanged, considering that SI loads contribute to Component Cooling additional heat load only.*
- C. *Correct, Per 1,2-47W611-67-5; 1-FCV-67-146, remains **THROTTLED** and 0-FCV-67-152 **OPENS** to 35% position. This arrangement assures adequate cooling water under both normal and emergency conditions.*
- D. *Incorrect, Plausible based on potential confusion with the cross-tie valve FCV-67-151 which does remain closed to prevent unbalance and maintain header supply independence, thus leading to the confusion that 1-FCV-67-146, **OPENS** fully; and 0-FCV-67-152, remains **CLOSED**, to provide enough ERCW flow to the emergency heat loads.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 53

Tier: 2 **Group** 1

K/A: 076 Service Water
K4.03 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 exchangers.

Importance Rating: 2.9 / 3.4

10 CFR Part 55: 41.7

10CFR55.43.b: N/A

K/A Match: This question matches the K/A by having the operator determine the automatic opening/repositioning of ERCW (Service Water) valves to the CCS heat exchangers during an emergency event.

Technical Reference: 1,2-47W611-67-5;
1,2-45N779-31, 38

Proposed references to be provided: None

Learning Objective: OPT200.ERCW obj. 1.b; 8.c

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question originally 076 A3.02 used on 2007 audit exam, SQN ILT 1211 Audit, SQN ILT 1305 Audit

Comments: stem wording modified to make more operationally valid

QUESTIONS REPORT
for 1503 RO Exam

54. 078 A4.01 054

Given the following plant conditions:

- A large air leak has been reported in the Turbine Building
- The following indications are noted on panel 1-M-15 in the Control Room:
 - Aux Cont Air Hdr A Press 90 psig and slowly rising
 - Aux Cont Air Hdr B Press 90 psig and slowly rising
 - Cont Air Hdr Press 95 psig and slowly rising
 - Serv Air Hdr Press 75 psig and slowly lowering

Which ONE of the following completes the statement below?

Service Air Isolation valve 0-PCV-33-4 is (1) and Aux Air Compressors A & B are (2).

- A. (1) OPEN
(2) RUNNING
- B. (1) OPEN
(2) OFF
- C. (1) CLOSED
(2) RUNNING
- D. (1) CLOSED
(2) OFF

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if the candidate does not recognize which systems get isolated by 0-PCV-33-4 and thinks that since Control Air header pressure is rising that the isolation valve is open. However it would be closed. Also plausible if the candidate got confused as to where the sensing pressure to start the Aux Air compressors is from. If they think its Service Air then its header pressure is below the value to start the Aux Air compressors (77 psig) thus they would think that both Aux Air compressors would be running.*

- B. *Incorrect, Plausible if the candidate does not recognize which systems get isolated by 0-PCV-33-4 and thinks that since Control Air header pressure is rising that the isolation valve is open. However it would be closed. Also plausible since the second part is correct.*

- C. *Incorrect, Plausible since the first part is correct, 0-PCV-33-4 would be closed at this point. Also plausible if the candidate got confused as to where the sensing pressure to start the Aux Air compressors is from. If they think its Service Air then its header pressure is below the value to start the Aux Air compressors (77 psig) thus they would think that both Aux Air compressors would be running.*

- D. *Correct, In accordance with AOP-M.02, at 88 psig in the service air header 0-PCV-33-4 closes to attempt to isolate a service air header leak from the instrument air system. As indicated in the stem, with Control air header pressure rising the leak must be isolated. Also with the leak isolating at 88 psig, the Aux Air compressors would not have reached their starting pressure (77 psig and lowering) thus they would not be running.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 54

Tier: 2 **Group** 1

K/A: 078 Instrument Air System
A4.01 Ability to manually operate and/or monitor in the control room:
Pressure gauges.

Importance Rating: 3.1 / 3.1

10 CFR Part 55: 41.7

10CFR55.43.b: Not applicable

K/A Match: This question matches the K/A by having the candidate evaluate the indications of Station air and Instrument air in the MCR and determine the expected system alignment based on those indications

Technical Reference: AOP-M.02
0-SO-32-2 rev 20
0-SO-33-1 rev 18

Proposed references to be provided: None

Learning Objective: OPL271CSA, Obj. 7

Question Source:
New X
Modified Bank
Bank

Question History: New question written for 1503 NRC exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

55. 103 A2.04 055

Given the following plant conditions:

- Unit 1 is in Mode 6.
- Reactor vessel head lift is in progress.
- A steady buzzing horn can be heard in containment.
- The alarm has been verified valid.

Which ONE of the following identifies the event and the required action?

<u>Event</u>	<u>Action</u>
A. Site accountability alarm	Place equipment in safe condition and Evacuate Containment
B. Site accountability alarm	Stop reactor vessel head lift and listen for instructions
<input checked="" type="checkbox"/> C. Source Range High Flux Level at Shutdown Alarm	Place equipment in safe condition and Evacuate Containment
D. Source Range High Flux Level at Shutdown Alarm	Reset Shutdown Monitor

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since a Site accountability alarm does alarm inside containment however it is an undulating alarm that lasts ~ 3 min. Also plausible since the second part is correct.*
- B. *Incorrect, Plausible since a Site accountability alarm does alarm inside containment however it is an undulating alarm that lasts ~ 3 min. Also plausible since the direction given for a Site accountability alarm is to place equipment in a safe condition prior to evacuation.*
- C. *Correct, A Source Range High Flux at Shutdown alarm condition indicates that while the reactor is shutdown there has been an unexpected rise in Source Range counts of 3X normal. This is an anticipatory alarm of a potential for an expected criticality and all personnel must evacuate containment.*
- D. *Incorrect, Plausible since the first part is correct, Also plausible if the candidate thinks that the shutdown monitor will need to reset, however all personnel are to evacuate containment.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 55

Tier: 2 **Group** 1

K/A: 103 Containment System
A2.04 Ability to (a) predict the impacts of the following malfunctions or operations on the containment system and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:
Containment evacuation (including recognition of the alarm)

Importance Rating: 3.5 / 3.6

10 CFR Part 55: 41.5

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate recall the alarm sound inside CNMT for High Flux at Shutdown and the required actions to be performed.

Technical Reference: 1-AR-M4-B, window B-1

Proposed references to be provided: None

Learning Objective: POT200.NIS obj 1.n; 4.b

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN Bank NIS-B.5.C 017 for 6/2009 Audit Exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

56. 001 K2.01 056

Given the following plant conditions:

- Unit 1 at 100% power.
- 480v Common Emergency Transformer is tagged out for replacement.
- 6900v Unit Board 1D is de-energized by relay operation.

Which ONE of the following describes the effect on the Control Rod Drive MG Sets?

- A. Both MG sets lose power to the motor.
- B. Neither MG set loses power to the motor.
- C. Only 1A MG set loses power to the motor.
- D. Only 1B MG set loses power to the motor.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible because the condition will cause a reactor trip but will not cause the Control Rod MG sets to trip.*
- B. *Incorrect, Plausible because if the board loss had been the B or C board neither of the MG sets would have lost power.*
- C. *Incorrect, Plausible because if the board loss had been the A board the 1A MG set would have lost power.*
- D. *Correct, the 1B MG set is supplied from 480v Unit board 1B which is supplied from the 6900v Unit Board 1D.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 56

Tier: 2 **Group** 2

K/A: 001 Control Rod Drive System
K2.01 Knowledge of bus power supplies to the following:
One-line diagram of power supply to M/G sets

Importance Rating: 3.5 / 3.6

10 CFR Part 55: 41.7

10CFR55.43.b: Not applicable

K/A Match: Question matches K/A because knowledge of Bus power supply to M/G sets are required to answer the question.

Technical Reference: 1,2-45N747-1 Rev 21
1,2-45N747-2 Rev 25

Proposed references to be provided: None

Learning Objective: OPT200RDCNT obj. 8.a

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: WBN bank question

Comments:

QUESTIONS REPORT
for 1503 RO Exam

57. 015 G2.2.40 057

Given the following plant conditions:

- Unit 1 is in Mode 2 during a plant startup
- Reactor power at $5 \times 10^{-5}\%$ on N-35 and N-36
- Intermediate Range N-35 fails Low.

Which ONE of the following identifies the required action(s), if any, for this failure?

- A. Power must remain above $5 \times 10^{-5}\%$ until N-35 is returned to OPERABLE.
- B. Enter E-0, "Reactor Trip or Safety Injection," and manually place SRM TRIP RESET : BLOCK switches to RESET.
- C. Place the level trip switch for N-35 to BYPASS and continue with plant startup.
- D. Restore N-35 to OPERABLE prior to increasing power above the P-6 setpoint.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if the candidate thinks that the Rx is above the P-6 setpoint ($10^{-4}\%$ power) and applies the direction for a failed intermediate range NI above P-6 which would allow the startup to continue.*
- B. *Incorrect, Plausible if the candidate gets the failure Low confused with a High failure of N-35 since a high failure of one channel would cause a Rx Trip and would prevent the SRMs from energizing when below P-6.*
- C. *Incorrect, Plausible since this action is performed for a failed N-35 detector to remove it from service, and since it has been removed from service the action to continue would apply to either a Source Range or Power Range detector for this power level.*
- D. *Correct, In accordance with Tech Spec 3.3.1.1 Action 3 specifies that with Rx power below P-6 if an intermediate range NI fails then the intermediate range channel must be returned to service prior to exceeding P-6.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 57

Tier: 2 **Group** 2

K/A: 015 Nuclear Instrumentation System (NIS)
G 2.2.40 Ability to apply technical specifications for a system.

Importance Rating: 3.4 / 4.7

10 CFR Part 55: 41.10

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate identify actions from Tech Specs for a failed Intermediate Range NI.

Technical Reference: AOP-I.01 rev 12
Tech Spec table 3.3.1.1

Proposed references to be provided: None

Learning Objective: OPT200.NIS obj. 11.a; 13.a

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question

Comments:

SQN Unit 1 & 2	NUCLEAR INSTRUMENT MALFUNCTION	AOP-I.01 Rev. 0012
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Step	Action/Expected Response	Response Not Obtained
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2.2 Intermediate Range Failure

CAUTIONS

- 1) If reactor power is below P-6 ($10^{-4}\%$), Tech Specs require restoring inoperable channel prior to raising power above P-6.
- 2) If reactor power is above P-6 but below 5% power, Tech Specs require restoring inoperable channel prior to raising power above 5%.

NOTES

- 1) If Intermediate Range channel is failed high, reducing reactor power to less than P-10 (10%) will result in a reactor trip. If control power is available, this condition will be corrected when the channel is bypassed in Step 6.
- 2) If any IR channel has failed high, then automatic re-enabling of Source Range indication may be disabled. SRMs may require manual reinstating.
- 3) Failure of Intermediate Range Channel may affect associated Source Range Channel.

1. **IF** unit is in Mode 2,
THEN
STABILIZE reactor power
at current level.

2. **EVALUATE** the following Tech Specs
for applicability:
 - 3.3.1.1 (3.3.1), Reactor Trip
System Instrumentation
 - 3.3.3.5, Remote Shutdown
Instrumentation
 - 3.3.3.7, Accident Monitoring
Instrumentation
 - 3.9.2, Refueling Operations
Instrumentation

QUESTIONS REPORT
for 1503 RO Exam

58. 016 A3.01 058

Given the following plant conditions:

- Unit 1 is at 60% power.
- Rod control is in MANUAL.
- Charging flow control valve 1-FCV-62-93A is in MANUAL.
- A temperature instrument failure results in a greater than 5% difference between Actual and Program pressurizer level.

Assuming **NO** operator action, which ONE of the following identifies the RTD failure ?

- A. Thot RTD #1 failed High
- B. Thot RTD #1 failed Low
- C. Tcold RTD #1 failed High
- D. Tcold RTD #1 failed Low

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible because the Thot failure would cause a change in the loop Tavg, however the automatic circuit will reject a single failed Thot signal and will not be passed through to the control system.*
- B. *Incorrect, Plausible because the Thot failure would cause a change in the loop Tavg, however the automatic circuit will reject a single failed Thot signal and will not be passed through to the control system.*
- C. *Correct, A single Tcold failure high will not be rejected by the Eagle 21 logic and will cause the Auctioneered High RCS Tavg signal to rise. This signal adjusts the pressurizer level control program setpoint resulting in an increase in the setpoint, compared to the actual level.*
- D. *Incorrect, Plausible since a single Tcold failure is not rejected by the Eagle 21 logic and will cause a change in loop Tave and will cause the loop Tave to decrease. The Auctioneered signal is High Auctioneered not Low Auctioneered thus the signal would not cause a deviation.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 58

Tier: 2 **Group** 2

K/A: 016 Non-Nuclear Instrumentation System (NNIS)
A3.01 Ability to monitor automatic operation of the NNIS, including:
Automatic selection of NNIS inputs to control systems

Importance Rating: 2.9* / 2.9*

10 CFR Part 55: CFR: 41.7 / 45.5

10CFR55.43.b: Not applicable

K/A Match: This question matches the K/A by testing the candidates knowledge of how the inputs from loop temperature RTDs are selected automatically under a failure condition.

Technical Reference: 1-AR-M5-A D-6 R39
47W610-68-1 thru 10

Proposed references to be provided: None

Learning Objective: OPT200.EAGLE 21 Obj 4.a

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: WBN 06/2011 NRC exam

Comments: Revised the question to change from 2 part to 1 part and revised the question to ask which RTD failed. Eliminated the PZR heater portion.

QUESTIONS REPORT
for 1503 RO Exam

59. 028 A2.02 059

Given the following plant conditions:

- Unit 2 was at 100% power when a large-break LOCA occurred.
- Containment hydrogen concentration reads 0.4% on both hydrogen analyzers.

Which ONE of the following identifies the operation of the hydrogen igniters and hydrogen recombiners, in accordance with E-1, "Loss of Reactor or Secondary Coolant," if containment hydrogen concentration remains at 0.4% throughout the accident?

Hydrogen igniters will be (1) and Hydrogen recombiners will (2).

- A. (1) off
(2) remain in standby
- B. (1) off
(2) be placed in service
- C. (1) on
(2) remain in standby
- D. (1) on
(2) be placed in service

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if the candidate gets the minimum setpoint for energizing the igniters confused with the minimum setpoint for the recombiners and thinks that both will not be needed until Hydrogen concentration is greater than 0.5%*
- B. *Incorrect, Plausible if the candidate gets the use of the Hydrogen igniters confused with the recombiners and thinks that the recombiners will be placed in service first and the igniters are still in standby during the given plant conditions.*
- C. *Correct, Per E-0 all Hydrogen Igniters are energized and the hydrogen analyzers are turned on (ES-05). If Hydrogen concentration is greater than 0.5% but less than 6% while monitoring during E-1 actions then the Hydrogen Recombiners are also turned on. Thus with Hydrogen concentration less than 0.5% the recombiners would remain in standby.*
- D. *Incorrect, Plausible since the first part is correct, the Hydrogen Igniters are placed in service during LOCA events. Also plausible if the candidate does not recognize that the Hydrogen Recombiners are not placed in service until hydrogen concentration is greater than 0.5%.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 59

Tier: 2 **Group** 2

K/A: 028 Hydrogen Recombiner and Purge Control System (HRPS)
A2.02 Ability to (a) predict the impacts of the following malfunctions or operations on HRPS and (b) based on those predictions use procedures to correct, control or mitigate the consequences of those malfunctions or operations:
LOCA condition and related concern over hydrogen.

Importance Rating: 3.5 / 3.9

10 CFR Part 55: 41.5

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by requiring applicant to determine the equipment designed to mitigate hydrogen that should be in operation, based on containment hydrogen concentration.

Technical Reference: E-0, Reactor Trip or Safety Injection rev 36
ES-0.5 Equipment Verifications rev 8
E-1 Loss of Reactor or Secondary Coolant rev 26

Proposed references to be provided: None

Learning Objective: OPL271.E-0 obj.7
OPL271.E-1 obj. 9

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: WBN Bank question

Comments:

QUESTIONS REPORT
for 1503 RO Exam

60. 034 K6.02 060

Given the following plant conditions:

- Unit 1 core has been off-loaded.
- 0800 - Irradiated fuel shuffles are in progress in the spent fuel pool.
- 0805 - Main Control Room Radiation Monitors, 0-RM-90-125 and 0-RM-90-126 both fail and are declared INOPERABLE.
- 0930 - Control Room Emergency Ventilation (CREVs) has **NOT** been placed in recirc mode.

For the previously listed conditions, which ONE of the following completes the statement below?

The actions of Tech Spec 3.3.3.1, "Radiation Monitoring Instrumentation," (1) being met, and the movement of irradiated fuel in the spent fuel pit (2).

LCO actions

Fuel Movement

- | | |
|-------------------|-----------------|
| A. are | can continue |
| B. are | must be stopped |
| C. are NOT | can continue |
| D. are NOT | must be stopped |

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since with only one rad monitor out of service, at least one train of CREVS needs to be placed in service within 7 days. Also movement of irradiated fuel may continue during those 7 days even without CREVS in service.*
- B. *Incorrect, Plausible that the candidate may get the requirements of actions for Control Room rad monitors confused, since there is a seven day LCO for placing CREVS in service with only one rad monitor out of service. Also plausible since the second part is correct.*
- C. *Incorrect, Plausible since the first part is correct. Also plausible if the candidate gets the time for stopping fuel movement confused since movement may continue for up to 7 days while CREVS is being placed in service.*
- D. *Correct, In accordance with TS 3.3.3.1, with both control room rad monitors OOS at least one train of CREVS must be placed in service within 1 hr. If at least one train is placed in service in recirc mode, then fuel movement may continue. However, since it has been longer than 1 hr, fuel movement must be stopped.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 63

Tier: 2 **Group** 2

K/A: 034 Fuel Handling
K6.02 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

10 CFR Part 55: 41.7 / 45.7

10CFR55.42.b: Not applicable

K/A Match: Question requires knowledge of the radiation monitoring system requirements during irradiated fuel movement in accordance with Technical Specifications thus requiring the knowledge that a malfunction of a monitor would require compliance with required action of the LCO (i.e. the effect of the loss)

Technical Reference: Technical Specification LCO 3.3.3.1, Radiation Monitoring Instrumentation, 0-AR-MI2-B, rev 30

Proposed references to be provided: None

Learning Objective: OPT200.FH obj. 6.
OPT200.CBVENT obj. 6. ; 12

Question Source:

New	<u> </u>
Modified Bank	<u> X </u>
Bank	<u> </u>

Question History: SQN question 034 K6.02 061(used on 2009 retake exam) modified.

Comments:

QUESTIONS REPORT
for 1503 RO Exam

61. 041 K3.02 061

Given the following plant conditions:

- Unit 1 is at 100% power when turbine impulse pressure PT-1-73 fails high.
- Thirty (30) seconds after the failure, a reactor trip is initiated by operator action.

Which ONE of the following identifies the expected response of the steam dump system?

The steam dumps will

- A. attempt to maintain the RCS Tavg at 552 °F with the reactor trip controller.
- B. attempt to maintain the RCS Tavg at 552 °F with the load rejection controller.
- C. attempt to maintain the RCS Tavg at 547 °F with the load rejection controller.
- D. fully open and remain open until RCS Tavg decreased below 540 °F.

DISTRACTOR ANALYSIS:

- A. *Correct, The initial effect of PT-1-73 failing high would be that the steam dumps would not open due to not being armed. However if they were armed then the steam dumps would open and lower RCS temperature. When a Rx trip occurs the Rx Trip controller takes over and attempts to modulate the steam dumps such that RCS temp is maintained at 552°F.*
- B. *Incorrect, Plausible if the candidate thinks that the steam dumps would be controlled by the load reject controller, and confuses the temperature which would maintain RCS temp at 552°F, however the temperature would be controlled by the reactor trip controller. The load rejection controller maintains 547°F*
- C. *Incorrect, Plausible if the candidate thinks that the RCS temperature would be controlled by the load reject controller and attempted to maintain 547°F following the Rx Trip.*
- D. *Incorrect, Plausible if the candidate does not recognize that PT-1-73, which is a normal input to steam dump control is not part of the controlling signal when a reactor trip occurs. If the failed signal were still controlling the steam dumps this would be the correct answer, the steam dumps would stay open until closed by low temperature interlock.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 61

Tier: 2 **Group** 2

K/A: 041 Steam Dump/Turbine Bypass Control
K3.02 Knowledge of the effect that a loss or malfunction of the Steam Dump/ Turbine Bypass Control System will have on the following:
RCS

Importance Rating: 3.8 / 3.9

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by testing if the candidate knows the effect of a failure of a pressure instrument on Steam Dump control and the required operator actions to mitigate the effects of the failure on RCS temperature following a reactor trip.

Technical Reference: TI-28 Attach 9 pg 8 & 14
47W611-1-2 rev 13

Proposed references to be provided: None

Learning Objective: OPT200.SDCS obj. 7

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank

Comments:

QUESTIONS REPORT
for 1503 RO Exam

62. 071 A1.06 062

Given the following plant conditions:

- Both Units are at 100% power.
- Waste Gas Decay Tank (WGDT) 'C' is to be released.
- ABGTS fan 'A' is tagged for maintenance.
- Neither of the Waste Gas Compressors are running.

Which ONE of the following identifies how readings on the listed radiation monitors would respond to an increase in the radiation level of the gas being released?

	<u>0-RM-90-118</u> <u>Waste Gas Effluent Monitor</u>	<u>Shield Building Vent Monitors</u>
A.	Remain Constant	1-RM-90-400 would increase
B.	Remain Constant	2-RM-90-400 would increase
C.	Increase	1-RM-90-400 would increase
D. ✓	Increase	2-RM-90-400 would increase

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if the candidate does not recognize that the waste gas radiation monitor, 0-RM-90-118, would remain in the flow path for the given alignment, and since it is in the flow path, it would see the release. Also, 1-RM-90-400 would NOT show an increase because the release would be out the Unit 2 Shield Building vent.*
- B. *Incorrect, Plausible if the candidate does not recognize that the waste gas radiation monitor, 0-RM-90-118, would remain in the flow path for the given alignment, and since it is in the flow path, it would see the release, also the release would be out the Unit 2 vent and 2-RM -90-400 monitor would show an increase.*
- C. *Incorrect, Plausible since the 0-RM-90-118 would show an increase but 1-RM-90-400 would NOT show an increase because the release would be out the Unit 2 Shield Building vent.*
- D. *Correct, with ABGTS a being tagged the release would be out the Unit 2 stack. the gas would pass both the 0-RM-90-118 and the 2-RM -90-400 monitors, thus both would show an increase.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 62

Tier: 2 **Group** 2

K/A: 071 Waste Gas Disposal System (WGDS)
A1.06 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with Waste Gas Disposal System operating controls including:
Ventilation system.

Importance Rating: 2.5 / 2.8

10 CFR Part 55: 41.5

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by testing the candidates knowledge of how the rad monitors associated with Aux Bldg Gas Treatment System would respond given the ventilation lineup provided.

Technical Reference: 0-SO-77-15, Waste Gas Decay Tank Release, Rev 18
1, 2-47W830-4, R48

Proposed references to be provided: None

Learning Objective: OPT200.GRW obj. 4

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank quesiton used on 1/2009 Audit

Comments:

QUESTIONS REPORT
for 1503 RO Exam

63. 072 K1.03 063

Given the following plant conditions:

- Both Units are at 100% power.
- 0-RM-90-103A, Spent Fuel Pit Radiation Monitor, fails HIGH.

Which ONE of the following identifies the expected plant response?

- A. ONLY Train B Aux. Building Isolation dampers close;
ONLY Train B Aux. Building General Supply, Exhaust and Fuel Handling exhaust fans trip.
- B. ONLY Train B Aux. Building Isolation dampers close;
ALL Aux. Building General Supply, Exhaust and Fuel Handling exhaust fans trip.
- C. BOTH Train A and Train B Aux. Building Isolation dampers close;
ONLY Train B Aux. Building General Supply, Exhaust and Fuel handling exhaust fans trip.
- D. BOTH Train A and Train B Aux. Building Isolation dampers close;
ALL Aux. Building General Supply, Exhaust, and Fuel handling exhaust fans trip.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since the first part of answer is correct and if the candidate thinks that the entire Aux Bldg vent system is train specific then only the train B components will actuate. However due to relaying both Aux Building General Supply, Exhaust and Fuel Handling Exhaust fans will trip.*
- B. *Correct, The Fuel Pool Area Rad monitors are train specific. 0-RM-90-103A will cause a Train B Aux Building Isolation dampers to close. And due to non-train specific relays, both Aux Building General Supply, Exhaust and Fuel Handling exhaust fans trip. It would take both monitors (RM-90-102 and 103) to have both trains of isolation dampers to close.*
- C. *Incorrect, Plausible if the candidate does not know that RM-90-102 would actuate Train A and RM-90-103 will actuate Train B of the Aux Bldg Isolation Dampers to close. This is unlike other automatic isolations. Also plausible however due to relaying both Aux Building General Supply, Exhaust and Fuel Handling Exhaust fans will trip.*
- D. *Incorrect, Plausible if the candidate doesn't know that RM-90-102 and 103 are train specific which is unlike other automatic isolations. Also the second part is correct.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 63

Tier: 2 **Group** 2

K/A: 072 Area Radiation Monitoring(ARM) system
K1.03 Knowledge of the physical connections and/or cause-effect relationships between the ARM and the following systems:
Fuel Building Isolation

Importance Rating: 3.6* / 3.7*

10 CFR Part 55: 41.2 to 41.9

10CFR55.43.b: not applicable

K/A Match: This question matches the K/A by having the candidate identify the cause-effect relationship associated with Fuel Pool Area Radiation monitors as they apply to Fuel Handling Area Isolation.

Technical Reference: 0-AR-M12b, Windows B-3, B-5
45N630-4
45W657-31

Proposed references to be provided: None

Learning Objective: OPT200.RM obj. 4 & 6

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: Question used on 2008 Audit exam.

Comments: SQN bank question modified such that RM-90-103A is rad monitor in stem vs RM-90-102.

QUESTIONS REPORT
for 1503 RO Exam

64. 075 K4.01 064

Which ONE of the following is a direct input to the 'C-9 CONDENSER AVAILABLE' permissive on 1-XA-55-4A, BYPASS AND PERMISSIVE panel on 1-M-4?

- A. At least one CCW pit level above setpoint.
- B. At least one CCW pump breaker must be closed.
- C. At least one CCW pump discharge valve must be fully open.
- D. At least one waterbox must have both the inlet and outlet MOVs open.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if the candidate thinks that CCW pit level above alarm setpoint would be required to assure a heat sink condition exists for dumping steam to the condenser, however this is not the interlock signal for C-9.*
- B. *Correct, For the C-9 Condenser Interlock to be met, at one of the CCW pump breakers must be closed. (it is assumed that if the breaker is closed the pump is running). Only one CCWP is needed to provide a heat sink for steam dump operation.*
- C. *Incorrect, Plausible if the candidate gets confused on the interlock for starting a CCWP instead of making the condenser available since the discharge valves being open if pumps are running or mostly closed is an interlock that needs to be met in order to start a CCWP.*
- D. *Incorrect, Plausible if the candidate gets confused on the interlock for starting a CCWP instead of making the condenser available since water box inlet and outlet MOVs being open is an interlock to starting a CCWP.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 64

Tier: 2 **Group** 2

K/A: 075 Circulating Water System
K4.01 Knowledge of circulating water system design feature(s)
and interlock(s) which provide for the following:
Heat sink

Importance Rating: 2.5 / 2.8

10 CFR Part 55: 41.7

10CFR55.43.b: not applicable

K/A Match: This question matches the K/A by having the candidate determine what interlock associated with the CCW pumps affect the heat sink available for use of the Steam Dumps.

Technical Reference: 1-47W611-1-2 rev 13
1,2-45N763-3 rev 19

Proposed references to be provided: None

Learning Objective: OPT200.CCW obj. 5.i

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN ILT 1211, SQN ILT 1311 Audit

Comments:

QUESTIONS REPORT
for 1503 RO Exam

65. 086 A4.01 065

Given the following plant conditions:

- The Electric Fire Pump is out of service for maintenance.
- A scrap lumber fire exists on site but is not affecting any plant equipment or structure(s).
- The Fire Brigade Leader calls the MCR and requests the Diesel Fire Pump be started.

Which ONE of the following identifies,

- (1) the action required to start the diesel fire pump
and
- (2) the effect on the High Pressure Fire Protection system if the pump were to overspeed after starting with the overspeed trip mechanism failing to function?

- A✓ (1) The MCR operator can start the pump from the MCR.
(2) HPFP header pressure would increase and remain high.
- B. (1) The MCR operator can **NOT** start the pump from the MCR, an AUO would have to start the pump locally.
(2) HPFP header pressure would increase and remain high.
- C. (1) The MCR operator can start the pump from the MCR.
(2) The pressure would increase until the pump automatically shuts down after a time delay.
- D. (1) The MCR operator can **NOT** start the pump from the MCR, an AUO would have to start the pump locally.
(2) The pressure would increase until the pump automatically shuts down after a time delay.

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *Correct, The Operator can start the Pump from the MCR. The DFP has a relief valve that will lift on high pressure. The Pump does have a timed delay high pressure trip but it is normally not in service. The DFP has a relief valve that will lift on high pressure.*
- B. *Incorrect, The Operator can start the Pump from the MCR. Plausible if the student does not know the pump can be started from the MCR. The Pump does have a timed delay high pressure trip but it is normally not in service. The DFP has a relief valve that will lift on high pressure.*
- C. *Incorrect, The Operator can start the Pump from the MCR. The Pump does have a timed delay high pressure trip but it is normally not in service. Also the fire protection Jockey pump has a time delay high pressure shutoff. However the DFP has a relief valve that will lift on high pressure and remains relieving until the DFP is shut-down.*
- D. *Incorrect, The Operator can start the Pump from the MCR. Plausible since the Pump does have a timed delay high pressure trip but it is normally not in service. Also the fire protection Jockey pump has a time delay high pressure shutoff. However the DFP has a relief valve that will lift on high pressure and remains relieving until the DFP is shut-down.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 65

Tier: 2 **Group** 2

K/A: 086 Fire Protection System (FPS)
A4.01 Ability to operate and/or monitor in the control room:
Fire Water pumps

Importance Rating: 3.3 / 3.3

10 CFR Part 55: 41.7

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by testing the candidates knowledge of the Fire Water System pumps which can be started from the MCR and the effect of starting the pump remotely.

Technical Reference: 0-SO-26-2 rev 13
AOP-N.01 rev 40
1,2-47W850-27 rev 8

Proposed references to be provided: None

Learning Objective: OPT200.HPFP obj. 1; 7

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: SQN bank question used on 1/2008 exam

Comments:

QUESTIONS REPORT

for 1503 RO Exam

66. G 2.1.14 066

Following a Safety Injection on Unit 2, which ONE of the following identifies the '**Procedural Requirement**' to ensure a plant announcement has been made regarding the reactor trip/safety injection?

- A. Immediately after completing the Immediate Action Steps in E-0, "Reactor Trip or Safety Injection".
- B. Immediately after transitioning from E-0, "Reactor Trip or Safety Injection" to another Emergency procedure.
- C. When directed to by a step in ES-0.1, "Reactor Trip Response".
- D. When directed to by a step in ES-0.5, "Equipment Verifications".

DISTRACTOR ANALYSIS:

- A. *Incorrect, ES-0.5 contains the direction for making a plant announcement. Plausible because the step following the Immediate Actions in E-0 is to perform ES-0.5 which contains the direction for making a plant announcement.*
- B. *Incorrect, ES-0.5 contains the direction for making a plant announcement. Plausible since other actions are often performed at procedure transitions, such as monitoring status trees and conducting crew briefs.*
- C. *Incorrect, ES-0.5 contains the direction for making a plant announcement. Plausible based on similarity of procedure designation as an ES type procedure.*
- D. *Correct, The Operator performing ES-0.5 is directed at Step 15 to ensure a plant announcement is made regarding Reactor Trip and SI.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 66

Tier: 3 **Group** _____

K/A: G 2.1.14 Knowledge of the criteria or conditions that require plant-wide announcements, such as pump starts, reactor trip, mode changes, etc.

Importance Rating: 3.1 / 3.1

10 CFR Part 55: 41.10

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by testing the candidates knowledge of the procedural requirements for making a plant announcement following initiation of a Safety Injection.

Technical Reference: ES-05 rev 8

Proposed references to be provided: None

Learning Objective: OPL271E-0 obj. 7

Question Source:

New	_____
Modified Bank	_____
Bank	<u>X</u>

Question History: SQN bank question from 1/2009 ILT exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

67. G 2.1.34 067

In accordance with Technical Specifications, which ONE of the following identifies the specific activity limits for the primary coolant in Mode 1?

	<u>Gross Activity</u>	<u>Dose Equivalent I-131</u>
A.	$\leq 100/E$ microcuries/gram	≤ 0.10 microcuries/gram
B✓	$\leq 100/E$ microcuries/gram	≤ 0.35 microcuries/gram
C.	$\leq 50/E$ microcuries/gram	≤ 0.10 microcuries/gram
D.	$\leq 50/E$ microcuries/gram	≤ 0.35 microcuries/gram

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since the first part is correct. Also plausible since the candidate could get the setpoint for administrative limit (≤ 0.10 microcuries/gram DOSE EQUIVALENT I-131) confused with the Tech Spec limit.*
- B. *Correct, In accordance with Tech Spec 3.4.8 the specific activity limits for the RCS gross activity is $\leq 100/E$ microcuries/gram and 0.35 microcuries/gram DOSE EQUIVALENT I-131.*
- C. *Incorrect, Plausible if the candidate gets the administrative limit for RCS activity, 50/E, confused with the Tech Spec limit. 50/E, is also the RCS activity limit which requires entry into AOP-R.06, High RCS Activity. Also plausible for the same reason, the candidate could get the administrative limit confused with the tech spec limit.*
- D. *Incorrect, Plausible if the candidate gets the administrative limit for RCS activity, 50/E, confused with the Tech Spec limit. 50/E, is also the RCS activity limit which requires entry into AOP-R.06, High RCS Activity. Also plausible since the second part is correct.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 67

Tier: 3 **Group** _____

K/A: G 2.1.34 Knowledge of the primary and secondary chemistry limits.

Importance Rating: 2.7 / 3.5

10 CFR Part 55: 41.10

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate recall the specific chemistry limits for both the primary and secondary coolant.

Technical Reference: Tech Spec 3.4.8 Reactor Coolant System - Specific Activity,
AOP-R.06, High RCS Activity, rev 12

Proposed references to be provided: None

Learning Objective: OPT200.TS-APP obj. 5

Question Source:

New	<u>X</u>
Modified Bank	_____
Bank	_____

Question History: New question written for 1503 ILT exam

Comments:

QUESTIONS REPORT
for 1503 RO Exam

68. G 2.1.5 068

Given the following plant conditions:

- Unit 1 is at 100% power
- Unit 2 is in Mode 3

In accordance with OPDP-1, "Conduct of Operations," which ONE of the following would meet the **minimum** requirements for Operation's shift staffing requirements for SROs and ROs?

(**EXCLUDING** the SM and the unexpected absence allowance)

- A. 2 SROs
3 UOs
- B. 2 SROs
4 UOs
- C. 4 SROs
3 UOs
- D. 4 SROs
4 UOs

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if the candidate gets the minimum shift staffing required by 10CFR50.54 (2 SROs and 3 ROs for 2 Units with shared Control Room), however the OPDP-1 requirements are more restrictive.*
- B. *Incorrect, Plausible if the candidate gets the minimum shift staffing required by 10CFR50.54 confused with OPDP-1 requirements. Also plausible since the number of UOs is correct.*
- C. *Incorrect, Plausible since the number of required SROs is correct. Also plausible if the candidate gets the minimum required number of UOs required by 10CFR50.54 (2 for the operating unit, 1 for the shutdown unit = 3) confused with the station minimum requirements which is 2 UOs per Unit.*
- D. *Correct, In accordance with OPDP-1, minimum staffing requirements comply with App R staffing requirements. It requires that 4 SROs (2 Unit Supervisors, 1 STA, and 1 Incident Commander). Also a minimum of 4 UOs (2 per unit) is required.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 68

Tier: 3 **Group** _____

K/A: G 2.1.5 Ability to locate and use procedures related to shift staffing, such as minimum crew compliment, overtime limitations, etc.

Importance Rating: 2.9/ 3.9

10 CFR Part 55: 41.10

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate identify the minimum shift staffing required by the site's Conduct of Operations procedure.

Technical Reference: OPDP-1, Conduct of Operations, rev 33
10CFR50.54

Proposed references to be provided: None

Learning Objective: OPL271.ADMINWKBK

Question Source:

New	_____
Modified Bank	<u> X </u>
Bank	_____

Question History: Modified bank question updated for latest revision of OPDP-1 (rev 33)

Comments:

QUESTIONS REPORT

for 1503 RO Exam

69. G 2.2.13 069

Given the following plant conditions:

- Unit 1 in Mode 5.
- 1-FCV-62-93, "Charging Flow Control Valve", is selected as a boundary isolation valve for a clearance on the CVCS charging header.

In accordance with NPG-SPP-10.2, "Clearance Procedure to Safely Control Energy", which ONE of the following is an acceptable method for tagging 1-FCV-62-93?

- A. Ensure the air isolation valve in the open position, place handswitch in closed position and tag both the air isolation valve and the handswitch.
- B. ✓ Close the valve, install a jacking device, isolate the air supply and tag both the jacking device and the air isolation valve.
- C. Dog the valve closed with its handwheel, isolate the air supply and tag both the handwheel and the air isolation valve.
- D. Isolate the air supply to the valve, place handswitch in closed position and tag both the air isolation valve and the handswitch.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since this action would close the valve, but it does not provide a safe work boundary. NPG-SPP-10.02 does not allow tagging an air supply valve open and tagging the control switch in the closed position to keep a fail open valve closed. A jacking device is required.*
- B. *Correct, Since FCV-62-93 is a fail open valve a jacking device must be installed to keep the valve in the closed position and the jacking device must be tagged with a hold order card. This would meet the requirements of NPG-SPP-10.02.*
- C. *Incorrect, Plausible however FCV-62-93 does not have a handwheel to dog the valve closed. Examinee may select since some valves do have dogs associated with them and that would be an acceptable method for tagging the valve.*
- D. *Incorrect, Plausible however FCV-62-93 fails open and this method would not close the valve, but examinee may confuse the failure mode of the valve and select this option.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 69

Tier: 3 **Group** _____

K/A: G 2.2.13 Knowledge of tagging and clearance procedures

Importance Rating: 4.1 / 4.2

10 CFR Part 55: 41.10

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate recall the tagging procedure requirements for an air operated valve that fails open.

Technical Reference: 1,2-47W610-62-2 rv 48
NPG-SPP-10.02, Clearance Procedure to Safely Control Energy, rev 9

Proposed references to be provided: None

Learning Objective: OPL271SPP-10.2 obj. 3

Question Source:

New	_____
Modified Bank	_____
Bank	<u>X</u>

Question History: Watts Bar bank question

Comments:

QUESTIONS REPORT
for 1503 RO Exam

70. G 2.2.2 070

Given the following plant conditions:

- Unit 2 is at 40% power.
- A steam leak develops on the common main steam header.
- The crew is preparing for a 1%/minute rapid shutdown.
- The turbine controls are in MANUAL due to an EHC circuit card failure.
- The following indications are present on the EHC control panel:
 - VALVE POSITION LIMIT light is DARK
 - OPER AUTO light is DARK
 - TURB MANUAL light is LIT

In accordance with AOP-C.03, "Rapid Shutdown or Load Reduction," which ONE of the following identifies how Turbine load will be reduced?

- A. Intermittently depressing the GV LOWER pushbutton.
- B. Intermittently depressing the Valve Position Limiter (VPL) lower pushbutton.
- C. Set the load rate to 1%, adjust the setter to 20, and depress the GO pushbutton.
- D. Turbine load cannot be reduced, a Turbine trip will be required.

DISTRACTOR ANALYSIS:

- A. *Correct, In accordance with AOP-C.03, the operators will use Appendix M to lower Turbine load if turbine controls are in manual. The turbine load is reduced by intermittently depressing the GV Lower pushbutton until desired load is achieved.*
- B. *Incorrect, Plausible because other AOPs/EOPs direct the use of VPL to rapidly reduce turbine load. AOP-S.01, and FR-S.1 both use the VPL to reduce load.*
- C. *Incorrect, Plausible since this the method normally used to reduce turbine load. However this method cannot be used if the OPER AUTO light is Dark on the EHC panel. This method would not function with EHC controls in Manual.*
- D. *Incorrect, Plausible if the examinee thinks that manual control would not be available and in accordance with AOP-C.03, if turbine load cannot be reduced then a turbine trip would be required.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 70

Tier: 3 **Group** _____

K/A: G 2.2.2 Ability to manipulate the console controls as required to operate the facility between shutdown and designed power levels.

Importance Rating: 4.6 / 4.1

10 CFR Part 55: 41.6

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by testing the candidates knowledge of to operate the Mn Turbine controls with a failure in the EHC control circuit as indicated by the specific lights being LIT or DARK on the EHC control panel.

Technical Reference: AOP-C.03, Rapid Shutdown or Load Reduction rev 29

Proposed references to be provided: None

Learning Objective: OPL271AOP-C.03

Question Source:

New	<u>X</u>
Modified Bank	_____
Bank	_____

Question History: New question written for 1503 ILT exam.

Comments:

QUESTIONS REPORT
for 1503 RO Exam

71. G 2.2.41 071

Given the following plant conditions:

- Unit 1 was operating at 100% when a Large Break LOCA occurs.
- It has been 2 hrs since the start of the event
- Containment pressure is 6 psig and stable for the last 30 minutes.
- Control power fuse (1-FU2-30-39B) for Containment Air Return Fan 1B-B has blown.
- The associated MCR handswitch (1-HS-30-39A) is in A-Auto.
- The OSC has dispatched a team to replace the blown control power fuse.

Using the associated electrical print in the reference package, which ONE of the following identifies:

- (1) when the Air Return Fan will Automatically start after the fuse is replaced,
and
- (2) where a copy of the current revision of an electrical print is required to be verified?

REFERENCE PROVIDED

- A. (1) immediately
(2) BSL
- B. (1) immediately
(2) Maximo
- C. (1) after a 10 minute time delay
(2) BSL
- D. (1) after a 10 minute time delay
(2) Maximo

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since the > 10 min time delay has elapsed since CNMT pressure is above phase B actuation setpoint. However, if the control power fuse blows, the TDPU relay will reset. BSL is the correct place to verify the current revision IAW NPG-SPP-31.1.*
- B. *Incorrect, Plausible since the > 10 min time delay has elapsed since CNMT pressure is above phase B actuation setpoint. However, if the control power fuse blows, the TDPU relay will reset. Also plausible since copies of prints can be found in Maximo, however these are not kept up to date and not the location for approved drawings.*
- C. *Correct, When the control power fuse is replaced, the TDPU will energize. After a 10 min time delay the fan will auto start. BSL is the correct place to verify the current revision IAW NPG-SPP-31.1.*
- D. *Incorrect, Plausible since the first part is correct. Also plausible since copies of prints can be found in Maximo, however these are not kept up to date and not the location for approved drawings.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 71

Tier: 3 **Group** _____

K/A: G 2.2.41 Ability to obtain and interpret station electrical and mechanical drawings.

Importance Rating: 3.5 / 3.9

10 CFR Part 55: 41.10

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate use an electrical drawing to determine how a piece of equipment will respond following the replacement of a blown fuse and also their knowledge of where the current copies of electrical drawings are located.

Technical Reference: NPG-SPP-31-1 rev 2
1,2-45N779-5 rev 19

Proposed references to be provided: 1,2-45N779-1 Detail A only
1,2-45N779-5 Containment Air Return Fan circuit only

Learning Objective: OPT200.Elect Print Reading obj. 13

Question Source:

New	<u>X</u>
Modified Bank	_____
Bank	_____

Question History: New question written for 1503 ILT exam

Comments:

QUESTIONS REPORT

for 1503 RO Exam

72. G 2.3.5 072

Given the following plant conditions:

- A source check is to be performed on CCS radiation monitor 1-RE-90-123.

Which ONE of the following completes the statements below?

The source check is verified by observing the _____ (1) _____ on 0-M-12.

The isolation function of the Surge Tanks' vent _____ (2) _____ be manually blocked during the source check in accordance with 1-SO-90-1, "Liquid Process Radiation Monitors."

- A. (1) analog rate meter trending upscale
(2) can
- B. (1) analog rate meter trending upscale
(2) can NOT
- C. (1) bargraph display responds upscale
(2) can
- D. (1) bargraph display responds upscale
(2) can NOT

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since observing the rate meter trending upscale is correct for different radiation monitors and because some radiation monitors outputs can be blocked during the performance of a source check but not this one.*
- B. *Incorrect, Plausible since observing the rate meter trending upscale is correct for different radiation monitors and because the isolation function can not be blocked on this meter during the source check is correct.*
- C. *Incorrect, Plausible since a successful source check being determined by observing the bargraph trending upscale is correct and some radiation monitors' outputs can be blocked during the performance of a source check but not this one.*
- D. *Correct, a successful source check is determined by observing the bargraph trending upscale. Also the isolation function is not available on this type monitor thus the valves could automatically isolate during the source check requiring them to be checked open after the source check is performed.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 72

Tier: 3 **Group** n/a

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

10 CFR Part 55: 41.11

10CFR55.43.b: Not applicable

K/A Match: This question matches the K/A by requiring the applicant to identify how to perform a source check on fixed radiation monitoring equipment and to determine how functions performed by the monitor are affected by the source check.

Technical Reference: 1-SO-90-1, Liquid Process Radiation Monitors, Rev 13
1,2-45N657-18 rev 14
1,2-45N670 rev 5

Proposed references to be provided: None

Learning Objective: OPT200RM Obj 7.a

Question Source:

New	<u> </u>
Modified Bank	<u> </u>
Bank	<u> X </u>

Question History: Original question used on Feb 2010 NRC exam

Comments:

QUESTIONS REPORT

for 1503 RO Exam

73. G 2.3.7 073

Which ONE of the following identifies when Radiation Protection approval is required prior to accessing overhead areas in the Auxiliary Building?

Areas greater than ...

- A. 4 feet off the floor except for permanently installed platforms.
- B. 4 feet off the floor including permanently installed platforms.
- C. 6 feet off the floor except for permanently installed platforms.
- D. 6 feet off the floor including permanently installed platforms.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if the candidate gets the height above the floor confused with the requirement for fall protection which is 4 ft. Also plausible since the second part is correct.*
- B. *Incorrect, Plausible if the candidate gets the height above the floor confused with the requirement for fall protection which is 4 ft. Also plausible if the candidate gets confused as to whether permanent platforms are exempt from this requirement or not.*
- C. *Correct, In accordance with RCI-01, General requirement "R" when working in the Aux Bldg RCA overhead areas, Radiation Protection must be contacted when ever an area 6 ft off the floor is to be accessed. This requirement does not apply to permanently installed platforms such as Thermal Barrier Booster Pump platforms.*
- D. *Incorrect, Plausible since the first part is correct areas greater than 6 ft off the floor requires that Rad Protection be contacted prior to access. Also plausible if the candidate gets confused as to whether permanent platforms are exempt from this requirement or not.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 73

Tier: 3 **Group** _____

K/A: G 2.3.7 Ability to comply with radiation work permit requirements during normal and abnormal conditions.

Importance Rating: 3.5 / 3.6

10 CFR Part 55: 41.12

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate recall radiation work permit requirements for working above the floor in the Radiological Control Area of the plant.

Technical Reference: RCI-01 Radiation Protection Program, rev 79

Proposed references to be provided: None

Learning Objective: OPL271C260, Obj B.9

Question Source:

New	_____
Modified Bank	_____
Bank	<u> X </u>

Question History: SQN bank question used on 1/2009 Audit

Comments:

QUESTIONS REPORT
for 1503 RO Exam

74. G 2.4.39 074

Given the following plant conditions:

- The Unit 1 CRO is in the Cafeteria eating lunch with an AUO who is assigned as an OSC responder.
- A Site Area Emergency has been declared due an earth quake.

In accordance with EPIP-8 "Personnel Accountability And Evacuation", which ONE of the following identifies responsibilities of the CRO and the AUO following the initiation of Assembly and Accountability.

- A✓ CRO - Swipe badge in the MCR card reader and report to the MCR.
AUO - Swipe badge in the Cafeteria card reader and report to the OSC.
- B. CRO - Swipe badge in the MCR card reader and report to the MCR.
AUO - Swipe badge in the MCR card reader, report to the MCR and wait to be transferred to the OSC by SED.
- C. CRO - Swipe badge in the Cafeteria card reader and report to the MCR.
AUO - Swipe badge in the Cafeteria card reader and report to the OSC.
- D. CRO - Swipe badge in the Cafeteria card reader, report to the OSC and wait to be transferred to the MCR by SED.
AUO - Swipe badge in the MCR card reader and report to the OSC.

QUESTIONS REPORT
for 1503 RO Exam

DISTRACTOR ANALYSIS:

- A. *CORRECT, the CRO 's designated assembly area is the Main Control Room and EPIP-8 directs the operator to report to the designated assembly area and to swipe badge in the card reader. The cafeteria is the designated assembly area for an AUO assigned to the OSC and the cafeteria card reader would be where their badge is to be swiped.*
- B. *Incorrect, Plausible since the CRO actions are correct, but the AUO would not report to the main Control Room to swipe their badge. The AUO would report to the OSC and swipe in at the cafeteria card reader. Also plausible since during emergencies AUOs are called to MCR to perform actions during EOPs, and EPIP-8 provides guidance on how personnel can be transferred from one station to another as the need arises with the SED concurrence.*
- C. *Incorrect, Plausible since there is an accountability card reader in the cafeteria and the candidate may think that they are to card into the nearest card reader so as not to delay the accounting of all site personnel. Also the AUO actions are correct, but the CRO would not swipe the card reader in the cafeteria. The CRO would report to the main control room and card in at the card reader in the MCR.*
- D. *Incorrect, Plausible since there is an accountability card reader in the cafeteria and the candidate may think that they are to card into the nearest card reader so as not to delay the accounting of all site personnel. However the CRO actions are incorrect. The CRO would report to the MCR and swipe in and the AUO would report to the OSC and swipe in the cafeteria card reader.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 74

Tier: 3 **Group** _____

K/A: G 2.4.39
Knowledge of RO responsibilities in emergency plan implementation.

Importance Rating: 3.9 / 3.8

10 CFR Part 55: 41.10

10CFR55.43.b: n/a

K/A Match: This question matches the K/A by having the candidate recall their responsibilities for accountability as defined by Emergency Plan procedures.

Technical Reference: EPIP-8, Personnel Accountability and Evacuation, Rev 20

Proposed references to be provided: None

Learning Objective: OPL271REP obj. 8

Question Source:

New	_____
Modified Bank	_____
Bank	<u> X </u>

Question History: SQN bank question used on Jan 2009 NRC exam with distractors re-worded for better psychometric balance and plausibility

Comments:

QUESTIONS REPORT
for 1503 RO Exam

75. G 2.4.4 075

Given the following plant conditions:

- Unit 1 is cooling down for refueling.
- RCS pressure is 340 psig.
- Tavg is 210°F.
- 1A-A D/G is tagged for maintenance.
- A loss of Off-Site power occurs.
- 1B-B D/G fails to start.

Which ONE of the following identifies the plant procedure that the crew is required to enter to mitigate the event?

- A. ECA-0.0, "Loss of All AC Power"
- B. AOP-P.01, "Loss of Offsite Power"
- C. AOP-P.05, "Loss of Unit 1 Shutdown Boards"
- D. AOP-P.07, "Degraded Grid Conditions or Generator Voltage Regulator Malfunction"

DISTRACTOR ANALYSIS:

- A. *Correct, In accordance with ECA-0.0 if all shutdown boards are de-energized and the unit is in Modes 1-4, then ECA-0.0 would be the controlling procedure and has a direct entry for loss of all power during Mode 4 conditions. ECA-0.0 contains the immediate operator actions for the loss of all AC power while in Modes 1-4.*
- B. *Incorrect, Plausible since parts of AOP-P.01 would be used as directed by ECA-0.0, however AOP-P.01 does not have direct entry for this conditions. If entered the AOP would immediately direct the operators to ECA-0.0.*
- C. *Incorrect, Plausible since AOP-P.05 does deal with loss of power to the SD boards, however the first step of the AOP transitions the operators to ECA-0.0.*
- D. *Incorrect, Plausible since AOP-P.07 does deal with Offsite power conditions that are off-normal or offsite power that is Inoperable, however the first step of the AOP transitions the operators to ECA-0.0.*

QUESTIONS REPORT
for 1503 RO Exam

Question Number: 75

Tier: 3 **Group** _____

K/A: G 2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.

Importance Rating: 4.5 / 4.7

10 CFR Part 55: 41.10

10CFR55.43.b: not applicable

K/A Match: This question matches the K/A by determining if the candidate can recognize the correct procedure to enter for the given plant conditions.

Technical Reference: ECA-0.0, rev 26
EPM-4, rev 24

Proposed references to be provided: None

Learning Objective: OPL271AOP-P.01 obj 2

Question Source:

New	_____
Modified Bank	<u> X </u>
Bank	_____

Question History: Modified bank question from 12/01 exam to change plant operating mode, which changed answer from B to A, also changed distractor C due to plausibility. SQN bank question with distractors C & D changed to increase the plausibility.

Comments: