

76. 007 EA2.02 076

Given the following plant conditions:

- Unit 1 was operating at 100% power with MD AFW pump 1B-B out of service for maintenance when an inadvertent reactor trip occurs.
- MD AFW pump 1A-A fails to start and could not be started manually.
- Upon entry into ES-0.1, "Reactor Trip Response," the CRO reports the TD AFW pump has tripped on overspeed.
- The operating crew is unable to restore any AFW flow.
- Current SG Narrow Range levels are:

<u>SG 1</u>	<u>SG2</u>	<u>SG3</u>	<u>SG4</u>
14%	4%	9%	18%

Which ONE of the following completes the statement below?

To restore water to the steam generators, the operating crew will implement (1) while continuing in ES-0.1 and a transition to FR-H.1, "Loss of Secondary Heat Sink," would be first required when (2) dropped below 10% narrow range.

- A. (1) FR-H.5, "Steam Generator Low Level,"
(2) one additional SG Level
- B. (1) FR-H.5, "Steam Generator Low Level,"
(2) all four SG levels
- C. (1) EA-2-2, "Establishing Secondary Heat Sink Using Main Feedwater or Condensate System"
(2) one additional SG Level
- D✓ (1) EA-2-2, "Establishing Secondary Heat Sink Using Main Feedwater or Condensate System"
(2) all four SG levels

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible because the conditions for implementing FR-H.5 do exist but the FR will not establish any flow but AFW which is not available and there is action required when 3 of the 4 SG get below a setpoint level but that is wide range levels identifying when feed and bleed is required not when FR-H.1 is to be entered*
- B. *Incorrect, Plausible because the conditions for implementing FR-H.5 do exist but the FR will not establish any flow but AFW which is not available and all four SG narrow range levels being less than 10% is correct.*
- C. *Incorrect, Plausible because implementing EA-2-2 is correct and there is action required when 3 of the 4 SG get below a setpoint level but that is wide range levels identifying when feed and bleed is required not when FR-H.1 is to be entered.*
- D. *Correct, ES-0.1 step 5 RNO directs "IF AFW flow CANNOT be established, **THEN ESTABLISH** main feedwater flow **USING** EA-2-2, Establishing Secondary Heat Sink Using Main Feedwater or Condensate System' and FR-H.1 is required if all SG narrow range levels are less than 10%.*

Question Number: 76**Tier:** 1 **Group** 1

K/A: 007 Reactor Trip
EA2.02 Ability to determine or interpret the following as they apply to a reactor trip:
Proper actions to be taken if the automatic safety functions have not taken place

Importance Rating: 4.3 / 4.6**10 CFR Part 55:** 41.7 / 45.5 / 45.6**10CFR55.43.b:** 5

K/A Match: Question requires knowledge of the proper actions following a Reactor trip when there is no AFW flow established to maintain the secondary heat sink safety function and is SRO because it requires knowledge to the procedure required to be implemented to mitigate the condition.

Technical Reference: ES-0.1, Reactor Trip Response, Revision 34
1-FR-0, Status Trees, Revision 1

Proposed references to be provided: None

Learning Objective: OPL271ES-0.1
6. Given the procedure and a set of initial plant conditions, determine actions required to mitigate the event in progress.

Question Source:

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

Question History: New question for the SQN 05/2013 exam.

Comments:

77. 011 EA2.08 077

Given the following plant conditions:

- Unit 2 was operating at 100% power when a LOCA occurred.
- A reactor trip and safety injection were initiated and the operating crew is currently performing E-1, "Loss of Reactor or Secondary Coolant," and has reached the step to "MONITOR SI termination criteria."
- Current conditions are:

Core Exit T/Cs	- 255°F
RCS pressure	- 16 psig and stable
PZR level	- 0%
RVLIS Lower Range	- 43% and trending up
Containment pressure	- 5.7 psig and trending down
All 4 SG NR levels	- 32-34%
SG 2, 3, & 4 pressures	- 880 psig and stable
SG 1 pressure	- 820 psig and slowly trending down
RWST level	- 26% and slowly trending down

Based on the above conditions, the Unit Supervisor will direct transition to _____

- A. ES-1.1, "SI Termination."
- B. E-2, "Faulted Steam Generator."
- C✓ ES-1.3, "Transfer to RHR Containment Sump."
- D. ES-1.4, "Transfer to Hot Leg Recirculation."

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since Secondary heat sink criteria (S/G level) is adequate and RCS pressure is stable or rising the candidate could determine that SI can be terminated and thus transition to ES-1.1, however there is not enough RCS subcooling nor adequate PZR level to support SI termination.*
- B. *Incorrect, Plausible since SG #1 pressure is slowly lowering and all other SG pressures are stable, and based on the direction of the E-1 foldout page item "If any S/G pressure dropping in an uncontrolled manner or less than 140 psig AND S/G NOT isolated" the candidate could decide that there are indications of a Faulted SG and needs to transition to E-2, "Faulted Steam Generator."*
- C. *Correct, for the conditions stated, RWST level is 26% and lowering which is less than the 27% low level alarm on the RWST. When the low level alarm is received the crew is to implement ES-1.3 and ensure that the ECCS pumps are aligned to the containment sump for recirculation and suction is isolated from the RWST.*
- D. *Incorrect, Plausible since E-1 will be continued in its entirety until a transition is directed to ES-1.4, "Transfer to Hot Leg Recirculation." (which would occur 5 hours after event initiated), however with RWST level at 26% and lowering the crew is to implement ES-1.3 and then when procedure actions are complete return to E-1.*

Question Number: 77**Tier:** 1 **Group** 1

K/A: 011 Large Break LOCA
EA2.08 Ability to determine or interpret the following as they apply to a
Large Break LOCA:
Conditions necessary for recovery when accident reaches stable phase

Importance Rating: 3.4* / 3.9***10 CFR Part 55:** 43.5 / 45.13**10CFR55.43.b:** 5

K/A Match: Question requires the applicant to determine the procedure that is to
be implemented when responding to a large break LOCA in order to
proceed with the recovery from the accident.

Technical Reference: E-1, Loss of Reactor or Secondary Coolant, Revision 24

**Proposed references
to be provided:** None

Learning Objective: OPL271E-1 obj. 11, obj 12**Question Source:**

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

Question History: New question for 1305 exam**Comments:**

78. 025 AA2.05 078

Given the following plant conditions:

- Unit 2 is in 'Reduced Inventory Conditions' operation in accordance with GO-13, "Reactor Coolant System Drain and Fill Operations."
- The RCS level is at Elevation 698' 2"
- RHR Train A in service with a flow rate of 2100 gpm.
- The OAC reports that RCS level is at Elevation 698' and that the RHR pump amps have started to fluctuate.
- The crew enters AOP-R.03, "RHR System Malfunction," Section 2.1, "RHR Malfunctions Due to Low Water Level During Reduced Inventory or Mid-Loop Ops."
- With Charging flow raised to maximum and letdown terminated, the RCS level is at Elevation 697' 10" and continues to slowly drop.

Based on the above conditions, in accordance with AOP-R.03, the RHR flow rate is required to be reduced to a flow rate between (1) and the crew will (2).

(1)(2)

A✓ 1000 gpm -1500 gpm

remain in AOP-R.03, Section 2.1

B. 1000 gpm -1500 gpm

transition to AOP-R.02, "Shutdown LOCA"

C. 1500 gpm -2000 gpm

remain in AOP-R.03, Section 2.1

D. 1500 gpm -2000 gpm

transition to AOP-R.02, "Shutdown LOCA"

DISTRACTOR ANALYSIS:

- A. *Correct, In accordance with AOP-R.03, Section 2.1, if the RHR pump shows signs of cavitation, the crew is directed to reduce RHR flow to between 1000 gpm and 1500 gpm, to attempt to stabilize flow. Also as directed by Sect 2.1, step 1.d. the operators are directed to return RCS level to the normal band by adjusting charging and letdown flow and if a leak is suspected then GO to Section 2.4 RHR Leak.*
- B. *Incorrect, Plausible since the first part is correct, the RHR flow is limited to 1000 gpm to 1500 gpm. Also plausible since there is direction in AOP-R.03 to transition to AOP-R.02 Shutdown LOCA, when a leak rate exceeds the capacity of one CCP with no letdown, however this applies when the plant is in Mode 4 or Mode 5 (NOT in reduced inventory/midloop). If the plant is in Midloop then crew remains in AOP-R.03 to recover.*
- C. *Incorrect, Plausible since RHR flow should be between 1500 gpm and 2000 gpm when the RCS is at reduced inventory/midloop. However with the indications in the stem the RHR pumps are showing signs of cavitation and the RHR flow is to reduced to 1000 to 1500 gpm. Also plausible since the second part is correct the crew is to remain in AOP-R.03 and transition to Sect 2.4 with indications of a leak.*
- D. *Incorrect, Plausible since RHR flow should be between 1500 gpm and 2000 gpm when the RCS is at reduced inventory/midloop. However with the indications in the stem the RHR pumps are showing signs of cavitation and the RHR flow is to reduced to 1000 to 1500 gpm. Also plausible since there is direction in AOP-R.03 to transition to AOP-R.02 Shutdown LOCA, when a leak rate exceeds the capacity of one CCP with no letdown, however this applies when the plant is in Mode 4 or Mode 5 (NOT is reduced inventory/midloop). If the plant is in Midloop then crew remains in AOP-R.03 to recover.*

Question Number: 78**Tier:** 1 **Group** 1

K/A: 025 Loss of Residual Heat Removal System (RHRS)
AA2.05 Ability to determine and interpret the following as they apply to
the Loss of Residual Heat Removal System:
Limitations on LPI flow and temperature rates of change

Importance Rating: 3.1 / 3.5**10 CFR Part 55:** 43.5 / 45.13**10CFR55.43.b:** 5

K/A Match: K/A is matched because the question requires the ability to determine the limitations on the RHR flow for given conditions and is SRO because it requires the selection of the procedure with which to proceed to mitigate an event.

Technical Reference: AOP-R.03, RHR System Malfunction, Revision 27

**Proposed references
to be provided:** None

Learning Objective: OPL271AOP-R.03

- 3. Given a set of initial plant conditions, determine initial Operator response to stabilize the plant.
- 7. Given the procedure and a set of initial plant conditions, determine actions required to mitigate the event in progress.
- 13. List any RHR flow limits per AOP-R.03 or O-SO-74-1.
- 18. Given a set of initial plant conditions, identify the appropriate procedure to be utilized for the following:
(SRO ONLY)

Question Source:

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

Question History: New question for the SQN 05/2013 exam**Comments:**

79. 026 AG2.4.45 079

Given the following plant conditions:

- Unit 2 is in Mode 3 for maintenance.
- The following annunciators are received:
 - "MISC EQUIP SUP HDR FLOW LOW," (M27B-B, A-3).
 - "LETDOWN HX OUTLET FLOW/TEMP ABNORMAL," (M27B-B, A-5)
 - "TS-62-78 LTDN HX OUTLET TO DEMIN TEMP HIGH," (M6C, A4)

Which ONE of the following identifies the procedure required to mitigate the event?

- A. AOP-M.09, "Loss of Charging."
- B. AOP-R.05, "RCS Leak and Leak Source Identification."
- C. AOP-M.03, "Loss of Component Cooling Water." section 2.3 Train A CCS Header Failure.
- D. AOP-M.03, "Loss of Component Cooling Water," section 2.4 Train B CCS Header Failure.

Feedback

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if the candidate does not recognize that the Letdown HX outlet flow/temp abnormal alarm is associated with CCS flow not letdown flow. Thus the alarmed conditions do not indicate a letdown heat exchanger tube failure, however if the candidate did think the a leak in letdown heat exchanger was the cause of the alarm, in accordance with AOP-M.09 step 7 if there is indications of a charging header leak/rupture the crew is directed to Dispatch personnel to identify and isolate rupture, thus entry into AOP-M.09 would be correct.*
- B. *Incorrect, Plausible if the candidate does not recognize that the Letdown HX outlet flow/temp abnormal alarm is associated with CCS flow not letdown flow. Also if the candidate thinks that a leak has developed in the letdown line, then going to AOP-R.05 for leak identification and isolation would be the appropriate procedure.*
- C. *Correct, At SQN the "A" CCS supply header supplies flow to the "B" train of CCS which cools the letdown heat exchanger. A rupture for the "B" train of CCS would cause both the Misc Equip Header flow low and the Letdown Hx outlet flow flow/temp abnormal alarm. The reduction in flow through the "B" CCS header would require the crew to implement AOP-M.03 sect 2.3 to mitigate this condition.*
- D. *Incorrect, Plausible if the candidate determines that the indications are that of a CCS rupture and thus would go to AOP-M.03. The CCS flow to the letdown heat exchanger is the "B" train not the "B" header, therefore going to sect 2.4 for Train B CCS Header failure would be incorrect.*

Question Number: 79**Tier:** 1 **Group** 1

K/A: 026 Loss of Component Cooling Water
AG 2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm.

Importance Rating: 4.1 / 4.3**10 CFR Part 55:** 41.10**10CFR55.43.b:** 5

K/A Match: This question matches the K/A by having the candidate review the alarms presented in the stem and prioritize the alarms to determine the correct course of action to take. SRO by having the candidate assess plant conditions and select the appropriate procedure or sect of the procedure that will correct or mitigate the event.

Technical Reference: AOP-M.03 rev 4
AR-M27B-D-A4 & A6
AR-M6C-A4

Proposed references to be provided: None

Learning Objective: OPT200.CCS obj.5 t & v; obj. 11.
OPL271AOP.M-03 obj. 2, 4, 14 (SRO only)

Question Source:

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

Question History: New question written for 1305 ILT exam

Comments:

80. 056 AG2.2.40 080

Given the following plant conditions:

- Unit 1 is operating at 100% power.
- Unit 2 is in Mode 4 with an RCS cooldown in progress.
- Both Unit 1 and Unit 2 Start Buses are aligned to "A" and "C" CSSTs respectively.
- DG 1A-A has been tagged for the past 8 hours for a planned 60 hour outage.

0700 - A complete loss of Bus 1 of 161 kV Switchyard occurs.

If the condition of the A.C. sources are unchanged, which ONE of the following identifies the maximum time following the 161 kV Bus loss that could be taken to have each of the units in compliance with LCO 3.8.1.1, A.C. Sources - Operating?

REFERENCE PROVIDED

<u>Unit 1</u>	<u>Unit 2</u>
A. 36 hours	30 hours
B. 36 hours	42 hours
C✓ 48 hours	42 hours
D. 48 hours	48 hours

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible because Unit 1 having a maximum of 36 hours could be determined if Hot Shutdown was mistaken for Hot Standby resulting in the 12 hours to restore being omitted due to already being 'in the Mode' and 30 hours for Unit 2 being the maximum time is correct .*
- B. *Incorrect, Plausible because Unit 1 having a maximum of 36 hours could be determine if Hot Shutdown was mistaken for Hot Standby resulting in the 12 hours to restore being omitted due to already being 'in the Mode' and 42 hours could be determined if the 12 hours to restore were inappropriately included.*
- C. *Correct, Per action "c", Unit 1 could use the sum of the 12 hours to restore, next 6 hours to be in Mode 4, and the following 30 hours to reach Mode 5 for a total of 48 hours. Since Unit 2 is already in Mode 4, it must be in Mode 5 within the following 30 hours.*
- D. *Incorrect, Plausible because Unit 1 having a maximum of 48 hours is correct and 42 hour could be determined if the 12 hours to restore were inappropriately included.*

Question Number: 80**Tier:** 1 **Group** 1**K/A:** 056 Loss of Off-Site Power
AG2.2.40 Ability to apply Technical Specifications for a system.**Importance Rating:** 3.4 / 4.7**10 CFR Part 55:** 41.10 / 43.2 / 43.5 / 45.3**10CFR55.43.b:** 2**K/A Match:** Question requires the ability to apply LCO action times to ensure the A.C. Sources Tech Spec remains met.**Technical Reference:** LCO 3.8.1.1, A.C. Sources - Operating,
Amendment 241 December 16, 1998**Proposed references to be provided:** LCO 3.8.1.1, A.C. Sources - Operating
(2 pages - 3/4 8-1 and 3/4 8-2)**Learning Objective:** OPT200.SWYD obj 11.**Question Source:**

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

Question History: New question for the SQN 05/2013 exam.**Comments:**

81. 062 AG2.I.23 081

Given the following plant conditions:

- Unit 1 and Unit 2 were operating at 100% RTP with Unit 1 CCS aligned to supply Spent Fuel Pool Cooling system.
- A loss of all ERCW occurred and the operating crews implemented AOP-M.01, "Loss of Essential Raw Cooling Water," on both units.
- An AUO is dispatched to perform AOP-M.01 Appendix J, "Installation of Temporary Cooling (HPFP) to CCP Oil Coolers," on both units.
- Ten minutes after entering AOP-M.01, the STA reports Unit 1 Status Trees indicate an ORANGE path to FR-S.1, "Nuclear Generation / ATWS," due to the Intermediate Range Monitors indicating a positive Startup Rate.

Which ONE of the following completes the statements below?

The AUO will be instructed to perform the AOP-M.01 Appendix J on Unit (1) first.

A transition to FR-S.1 (2) required.

- | | <u>(1)</u> | <u>(2)</u> |
|----|------------|---------------|
| A. | 1 | is |
| B. | 1 | is NOT |
| C. | 2 | is |
| D✓ | 2 | is NOT |

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible because Unit 1 is supplying the SFP which is a added heat source during normal conditions and the Status trees conditions indicate an Orange path which is normally required to be made immediately.*
- B. *Incorrect, Plausible because Unit 1 is supplying the SFP which is a added heat source during normal conditions and not transitioning to the FRIs correct as per the note at the start of AOP-M.01 Section 2.12*
- C. *Incorrect, Plausible because Unit 2 is the unit that is not supplying the SFP and will heat up faster, Also because the Status Trees conditions indicate an Orange path which is normally required to be made immediately.*
- D. *Correct, The CCS for the unit NOT supplying SFP cooling will have a faster heatup rate. Therefore, establishing temporary cooling to a CCP on the unit NOT supplying the SFP is more time critical. AOP-M.01 Note 2 at the beginning of Section 2.12, Loss of Essential Raw Cooling Water, states this section takes priority over all other AOPs. Other AOPs should NOT be performed concurrently except for AOP-T.01 (Security Events).*

CAUTION 1 Temporary cooling water supply from HPFP to one CCP should be established as soon as possible.

CAUTION 2 CCS for the unit NOT supplying SFP cooling will have a faster heatup rate. Therefore, establishing temporary cooling to a CCP on the unit NOT supplying the SFP is more time critical.

- 1. **INITIATE** temporary cooling to one CCP:
 - a. **DETERMINE** which CCP (one per unit) to install temporary cooling water supply.
 - b. **ENSURE** operators dispatched to perform Appendix J, Installation of Temporary Cooling (HPFP) to CCP Oil Coolers.

This section takes priority over all other AOPs. Other AOPs should NOT be performed concurrently except for AOP-T.01 (Security Events).

Question Number: 81**Tier:** 1 **Group** 1

K/A: 062 Loss of Nuclear Service Water
AG2.1.23 Conduct of Operations
Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Importance Rating: 4.3 / 4.4**10 CFR Part 55:** 41.10 / 43.5 / 45.2 / 45.6**10CFR55.43.b:** 5

K/A Match: K/A is matched and the question is SRO because the question requires the ability to determine which unit the AOP Appendix will be performed first and how the Orange path being identified affects the procedure path to mitigate the event (both of which involve the performance of specific system and integrated plant procedures.)

Technical Reference: AOP-M.01, Loss of Essential Raw Cooling Water,
Revision 23

Proposed references to be provided: None

Learning Objective: OPL271AOP-M.01, obj. 11; 13 (SRO only)

Question Source:

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

Question History: SQN bank question 062 AG 2.1.7 modified for use on the SQN 05/2013 exam

Comments:

82. 003 AG2.2.36 082

Given the following plant conditions:

- Unit 1 is operating at 95% power.
- A troubleshooting activity in the Rod Control Power Cabinet 2BD resulted in blowing a Control Bank Rod stationary gripper fuse which caused control rod H12 to drop.
- AOP-C.01, "Rod Control System Malfunctions," is entered and a load reduction is initiated as required.
- 35 minutes after the dropped rod occurred, the fuse has been replaced and the reactor power is 83%.

Which ONE of the following completes the statements below?

If the dropped rod can be recovered within 1 hour, Tech Specs (1) the rod to be recovered with current conditions.

If the dropped rod **CANNOT** be recovered within 1 hour, Tech Specs (2) require the high neutron flux trip setpoints to be reduced within 4 hrs.

- | | <u>(1)</u> | <u>(2)</u> |
|----|---------------------|---------------|
| A. | allow | do NOT |
| B✓ | allow | do |
| C. | do NOT allow | do NOT |
| D. | do NOT allow | do |

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since the first part is correct, if the malfunction is repaired during the shutdown the rod may be returned to alignment with its bank at any power level. Also plausible since reactor power has already been lowered to less than 85% the candidate may get the power reduction confused with the High Flux trip setpoint being lowered.*
- B. *Correct, In accordance with T.S. 3.1.3.1 Movable Control Assemblies, action c. power operation may resume provided that within one hour either: The rod is restored within the above alignment requirements. This requirement allows for the rod to be recovered at any time (or power level) during the LCO time. Also if the rod is not restored then power must be reduced to $\leq 75\%$ within one hour and within the next 4 hours the high neutron flux trip setpoints is reduced to less than or equal to 85% of Rated Thermal Power.*
- C. *Incorrect, Plausible if the candidate thinks that the Tech Spec requires reactor power to be reduced to $\leq 75\%$ before recovery of the dropped rod can occur. Also plausible since reactor power has already been lowered to less than 85% the candidate may get the power reduction confused with the High Flux trip setpoint being lowered.*
- D. *Incorrect, Plausible if the candidate thinks that the Tech Spec requires reactor power to be reduced to $\leq 75\%$ before recovery of the dropped rod can occur. Also plausible since the second part is correct, if the rod is not restored then power must be reduced to $\leq 75\%$ within one hour and within the next 4 hours the high neutron flux trip setpoints is reduced to less than or equal to 85% of Rated Thermal Power.*

Question Number: 82**Tier:** 1 **Group** 2

K/A: 003 Dropped Control Rod
AG2.2.36 Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.

Importance Rating: 3.1 / 4.2**10 CFR Part 55:** 41.10 / 43.2 / 45.13**10CFR55.43.b:** 2

K/A Match: This question matches the K/A by testing the candidates knowledge of how a degraded power supply in the Control Rod Drive system will affect system operation. SRO by having the candidate apply the Tech Spec actions that would be required for the given conditions.

Technical Reference: AOP-C.01, Rod Control System Malfunctions,
Revision 22

**Proposed references
to be provided:** None

Learning Objective: OPL271AOP-C.01, obj. 8
OPT200.TS-APP obj. 4, 5

Question Source:

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

Question History: New question for the SQN 05/2013

Comments:

83. 028 AG2.4.50 083

Given the following plant conditions:

- Unit 2 is at 100% rated thermal power.
- 1000 - PZR channel LI-68-335 fails and is removed from service per AOP-I.04, "PZR Instrument and Control Malfunctions".
- 1030 - PZR channel LI-68-320 fails to 15% indicated level.
- 1045 - PZR channel LI-68-335 is returned to service.

Which ONE of the following identifies:

(1) how alarm, "LS-68-335 D/E Pressurizer Level High-Low", (2M5A, C3) will respond

and

(2) the required Technical Specification action for this condition?

2-M5-A C-3 Status

TS action

- | | |
|--|---|
| A✓ Alarms with 2 nd failure | Place the affected bistables for LI-68-320 in trip by 1630. |
| B. Alarms with 2 nd failure | Be in Hot Standby by 1630. |
| C. Was already in alarm before 2 nd failure | Be in Hot Standby by 1630. |
| D. Was already in alarm before 2 nd failure | Place the affected bistables for LI-68-320 in trip by 1630 |

DISTRACTOR ANALYSIS:

- A. *Correct, The alarm will actuate with the 2nd failure as it cleared out when the level control channel selector switch was placed in the LT-68-335 & 320 position, since the PZR level control ckt feeds the alarm based on which channel is selected.. When the 2nd PZR level channel becomes inoperable, Tech Spec LCO 3.0.3 now applies. This would allow one hour to correct the condition or a unit shutdown will begin. With the first channel repaired, the LCO action for one failed channel would apply, thus the bistables for the second failed channel would be required to be tripped within 6 hrs of instrument failure.*
- B. *Incorrect, Plausible as the alarm will actuate with the 2nd failure. Also plausible since Tech Spec 3.0.3 applies with two channels inoperable and the candidate may think that the Unit would be required to be shutdown. This would allow one hour to correct the condition or be in Hot Shutdown within 6 hrs. However with the first channel repaired, the Tech Spec LCO of 3.3.1.1 would apply and the bistables for the second failed channel would be required to be tripped within 6 hrs of instrument failure.*
- C. *Incorrect, Plausible since the alarm already being in alarm is possible as there are some alarms that are fed by the transmitter directly and would remain in alarm until the condition clears. The PZR level control ckt feeds the alarm based on which channel is selected. Also plausible since Tech Spec 3.0.3 applies with two channels inoperable and the candidate may think that the Unit would be required to be shutdown. This would allow one hour to correct the condition or be in Hot Shutdown within 6 hrs. However with the first channel repaired, the Tech Spec LCO of 3.3.1.1 would apply and the bistables for the second failed channel would be required to be tripped within 6 hrs of instrument failure.*
- D. *Incorrect, Plausible since the alarm already being in alarm is possible as there are some alarms that are fed by the transmitter directly and would remain in alarm until the condition clears. The PZR level control ckt feeds the alarm based on which channel is selected. Also plausible since the when the 2nd PZR level channel becomes inoperable, Tech Spec LCO 3.0.3 now applies. This would allow one hour to correct the condition or a unit shutdown will begin. With the first channel repaired, the LCO action for one failed channel would apply, thus the bistables for the second failed channel would be required to be tripped within 6 hrs of instrument failure.*

Question Number: 83**Tier:** 1 **Group** 2

K/A: 028 Pressurizer (PZR) Level Control Malfunction
G2.4.50 Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.

Importance Rating: 4.2 / 4.0**10 CFR Part 55:** 41.10 / 43.5 / 45.3**10CFR55.43.b:** 2

K/A Match: The question meets the first part of the K/A in that it requires the examinee to verify that the condition in the stem causes a PZR level alarm for the second time which also requires knowledge of the procedure to remove the first failed channel from service.
The question meets the second part of the K/A in that it requires the examinee to determine actions contained in the applicable AR for a PZR high/Low level condition.
The question is at the SRO level of knowledge as it requires application of the generic rules of usage for LCO 3.0.3.

Technical Reference: 1-AR-M5-A, C-3 R34
Technical Specifications LCO 3.0.3 usage
AOP-I.04, PZR Instrument and Control Malfunctions
R12
DWG 2-47W611-68-2

Proposed references to be provided: None

Learning Objective: OPL271AOP-I.04, #'s 3, 7, 8, 13

Question Source:

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

Question History: New for ILT 1305 NRC exam

Comments:

84. 068 AA2.06 084

Given the following plant conditions:

- 0500 - Conditions arise that require the Unit 1 Main Control Room (MCR) to be abandoned.
- 0501 - The reactor is TRIPPED.
- 0505 - All MCR actions of AOP-C.04, "Shutdown From Auxiliary Control Room," were completed and the crew has established control in the Auxiliary Control Room.
- 0515 - Tech Spec 3.0.3 is entered.
- 0730 - The crew initiates a natural circulation cooldown.

Which ONE of the following completes the statements below?

Prior to the cooldown, RCS Pressure is being controlled by PZR backup heaters cycling between ____ (1) ____ .

The latest time allowed by Tech Specs to place the unit in Mode 5 is at ____ (2) ____ the next day.

- A. (1) 2210 psig and 2218 psig
(2) 1215
- B. (1) 2210 psig and 2218 psig
(2) 1815
- C✓ (1) 2210 psig and 2250 psig
(2) 1215
- D. (1) 2210 psig and 2250 psig
(2) 1815

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if the candidate does not recall that the setpoint at which the backup heaters cycle changes when selected to AUX, since the normal pressure that the PZR backup heaters cycle is 2210 psig to 2218 psig. Also plausible since the second part is correct. The crew has 6 hrs to reach Hot Shutdown (Mode 4) and 24 hrs to reach Cold Shutdown (Mode 5). The total time would be 31 hrs from 0515, making 1215 the next day the correct time for the plant to be in Mode 5.*
- B. *Incorrect, Plausible if the candidate does not recall that the setpoint at which the backup heaters cycle changes when selected to AUX, since the normal pressure that the PZR backup heaters cycle is 2210 psig to 2218 psig. Also plausible since 1815 would have been the correct time if the plant had been in Mode 1 when 3.0.3 was entered because there would be 6 additional hours to get to Mode 3.*
- C. *Correct, When the controls for the PZR backup heaters A & B are transferred to the AUX position, the setpoint for normal operation changes from on at 2210 psig and off at 2218 psig to on at 2210 psig and off at 2250 psig. Also since the plant was already in Mode 3 when T.S 3.0.3 was entered crew does not get the initial 6 hrs to reach Mode 3 thus the crew has 6 hrs to reach Hot Shutdown (Mode 4) and 24 hrs to reach Cold Shutdown (Mode 5). The total time would be 31 hrs from 0515, making 1215 the next day the correct time for the plant to be in Mode 5.*
- D. *Incorrect, Plausible since the first part is correct the PZR backup heaters cycle between 2210 psig and 2250 psig in the AUX position vs 2210 psig and 2218 psig in normal mode. Also plausible since 1815 would have been the correct time required for Mode 5 if the plant had been in Mode 1 when 3.0.3 was entered because there would be 6 additional hours to get to Mode 3.*

Question Number: 84**Tier:** 1 **Group** 2

K/A: 068 Control Room Evacuation
AA2.06 Ability to determine and interpret the following as they apply to the
Control Room Evacuation:
RCS pressure

Importance Rating: 4.1 / 4.3**10 CFR Part 55:** 43.5 / 45.13**10CFR55.43.b:** 5

K/A Match: KA is matched because the question requires knowledge of expected
RCS pressure when operating from the AUX Control Room following
Control Room Evacuation and is SRO because it requires knowledge
of Tech spec action time requirements after LCO 3.0.3 is entered.

Technical Reference: AOP-C.04, Shutdown From Auxiliary Control Room,
Revision 25
Tech Spec 3.0.3

**Proposed references
to be provided:** None

Learning Objective: OPL271-C.04 obj. 5, 9, 11

Question Source:

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

Question History: Modified bank question by changing times, and
parameter to be maintained in the stem and for 1305 ILT
exam

Comments: Original question #82 from 1/2009 NRC exam

85. W/E10 EA2.2 085

Given the following plant conditions;

- Unit 1 has been operating for 377 days.
- The condensate storage tank is at 245,000 gals and lowering due to a leak.
- A loss of offsite power has occurred.
- Both units are tripped.
- Unit 1 has remained in Hot Standby conditions with T-hot at 550°F for 1.5 hours awaiting the return of offsite power.
- Power System Ops has just indicated that it will be at least another 8 hrs before offsite power can be restored.

Which ONE of the following identifies the procedural actions that would be required to comply with the times described in T.S. 3.7.1.3 "CONDENSATE STORAGE TANK" basis?

Note:

ES-0.1 "Reactor Trip Response"

ES-0.2 "Natural Circulation Cooldown"

ES-0.3 "Natural Circulation Cooldown With Steam Void in the Vessel (with RVLIS)"

- A. Transition to ES-0.2 and cooldown to RHR entry conditions.
- B. Transition to ES-0.3 and cooldown to RHR entry conditions.
- C✓ Transition to ES-0.2, then transition to ES-0.3 to cooldown to RHR entry conditions.
- D. Maintain current plant conditions in accordance with ES-0.1 until offsite power is restored.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if the applicant determines that a normal post trip cooldown at 50°F/hr would be used to place the plant in a condition to go on RHR. However based on the Tech Spec basis for Condensate Storage tank volume there would not be enough water left in the tank (2hr at Hot Standby followed by 6 hr of cooldown to RHR conditions) to accomplish the cooldown. A transition to ES-0.3 would be required to get to RHR conditions since it allows a cooldown rate of 100°F/hr.*
- B. *Incorrect, Plausible if the applicant determines that a cooldown rate of 100 °F/hr would be required to meet RHR entry conditions, however a direct transition to ES-0.3 is not allowed. The first 12 steps of ES-0.2 must be performed prior to entry into ES-0.3.*
- C. *Correct, The decision to proceed as quickly as possible due to a condition such as CST inventory requires a transition to ES-0.3, since a rate of 100°F/hr would be required to ensure the plant could reach RHR conditions before the CST is depleted. Given the conditions in the stem, a transition to ES-0.2 is required and then a transition to ES-0.3 after the first 12 steps of ES-0.2 have been completed.*
- D. *Incorrect. Plausible if the candidate does not recall that the basis for the minimum volume of the CST and determines that the best course of action would be to continue maintaining Hot Standby conditions in accordance with ES-0.1. This would not be allowed based Tech Specs.*

Notes

Question Number: 85**Tier:** 1 **Group** 2

K/A: W/E10 Natural Circulation with Steam Void in the Vessel with/without RVLIS
EA2.2 Ability to determine and interpret the following as they apply to the (Natural Circulation with Steam Void in 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:** N/A**10CFR55.43.b:** 5**K/A Match:** This question matches the K/A by having the candidate determine

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K/A Match: This question matches the K/A by having the candidate determine the correct procedure to be implemented based on conditions in the stem (Tech Spec minimum volume for the CST) and applying the times provided in Tech Spec basis to the procedure useage that would be required to prevent the plant from violating the limits in Tech Specs.

SRO by testing the candidates knowledge of Tech Spec basis and assessing plant conditions and selecting appropriate procedures to mitigate the accident.

Technical Reference: ES-0.3, Natural Circulation Cooldown with Steam Void in Vessel (With RVLIS), Rev 13
ES-0.2, Natural Circulation Cooldown, Rev 15
T.S. 3.7.1.3 Bases

Proposed references to be provided: None

Learning Objective: OPL271ES0.3 obj 5 & 6
OPT200.COND obj 11

Question Source:

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

Question History: SQN bank question written for SQN 1201 NRC exam.
Correct answer changed to "C" and distractor "D"
changed to include guidance for ES-0.1.

Comments:

86. 003 G2.4.11 086

Given the following plant conditions,

- Unit 1 is operating at 100% power
- 0700 - Alarm "LS-62-6A REAC COOL PMP 1 STANDPIPE LVL HIGH-LOW," (M5-B, A2) is received.
- No other alarms are received.
- 0702 - 1-FCV-81-13, "RCP 1 Standpipe Makeup Water" is opened for 20 secs and closed.
- 0705 - Annunciator M5-B, A2 remains lit.
- Radwaste reports that RCDT level is 14% (52.0 gals).
- 0720 - While performing actions of AOP-R.04, "Reactor Coolant Pump Malfunctions," Radwaste reports that RCDT level is 22% (76.4 gals).

Based on current conditions and in accordance with AOP-R.04, the crew will transition to ___(1)___ and ___(2)___.

- A. (1) AOP-R.04, Section 2.5, "#3 Seal Leakoff High Flow on ANY RCP"
(2) initiate an SR to replace the seal as soon as possible.
- B. (1) AOP-R.04, Section 2.4, "#2 Seal Leakoff High Flow on ANY RCP"
(2) initiate an SR to replace the seal as soon as possible.
- C. (1) AOP-R.04, Section 2.5 "#3 Seal Leakoff High Flow on ANY RCP"
(2) perform a normal plant shutdown and stop #1 RCP within 8 hrs.
- D✓ (1) AOP-R.04, Section 2.4 "#2 Seal Leakoff High Flow on ANY RCP"
(2) perform a normal plant shutdown and stop #1 RCP within 8 hrs.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible if the candidate gets confused as to what caused the standpipe alarm only. If this alarm is identified as a Loss of #3 seal then the crew is to write an SR and have the RCP seal replaced as soon as possible since this could cause problems with seal leakage into the RCP bowl.*
- B. *Incorrect, Plausible since the first part is correct the indications are of a #2 seal malfunction. Also plausible if the candidate gets the confused as to the guidance in AOP-R.04 about RCP seal malfunctions. Write an SR and have the seal replaced as soon as possible is the guidance given for a #3 seal malfunction not a #2 seal problem.*
- C. *Incorrect, Plausible if the candidate gets confused as to what caused the standpipe alarm only. This alarm could be confused as a Low Standpipe condition which is indicative of a #3 seal failure Also plausible if the candidate determines the leak rate into the RCDT (1.6 gpm) and then mis-applies the guidance for a #2 seal failure not #3, which would direct the crew do a normal reactor shutdown and secure the affected RCP within 8 hrs.*
- D. *Correct, In accordance with AR-M5-B, A-2 and AOP-R.04, the condition of HIGH-LOW Standby alarm can be verified by attempting to fill the standby. If the alarm clears then it was a low level condition, if the alarm does not clear it was a high level condition, indicating a problem with #2 RCP seal. As given then a problem with #2 seal is indicated. Also the candidate will need to determine the leakrate into the RCDT. With a change in level from 52 gals to 76.4 gals in 15 minutes then the leak would be $24.4/15 = 1.6$ gpm. If the leak rate into the RCDT from the #2 seal is $> .5$ gpm then the crew is directed to do a normal plant shutdown and and secure the affected RCP within 8 hrs.*

Question Number: 86**Tier:** 2 **Group** 1**K/A:** 003 Reactor Coolant Pump (RCP)
G 2.4.11 Knowledge of abnormal condition procedures.**Importance Rating:** 4.0 / 4.2**10 CFR Part 55:** 41.10**10CFR55.43.b:** 5**K/A Match:** This question matches the K/A by testing the candidates knowledge of the RCP Malfunction AOP and the direction that the SRO would give to the crew concerning plant operation.**Technical Reference:** AOP-R.04 rev 27
AR-M5-B, A-2, rev 39**Proposed references to be provided:** None**Learning Objective:** OPT200.RCP obj. 3.j.
OPL271AOP-R.04 obj 7**Question Source:**

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

Question History: New question written for 1305 exam**Comments:**

87. 010 A2.02 087

Given the following plant conditions:

- Unit 1 is in Mode 3 with the RCS at normal operating temperature and pressure with the following conditions:
 - RCP #4 out of service.
- A Safety injection occurs due to a Steam Generator #3 tube rupture.
- The operating crew has just completed a rapid plant cooldown in accordance with E-3, "Steam Generator Tube Rupture," and is ready to initiate RCS depressurization.

Which ONE of the following identifies ...

- (1) a condition that would result in the pressurizer sprays being ineffective in depressurizing the RCS
- and
- (2) the action required to accomplish the RCS depressurization as a result of the normal spray valves being ineffective?

(1) <u>Condition</u>	(2) <u>Action required to depressurize the RCS</u>
A✓ Trip of the RCP #2	Use a pressurizer PORV in accordance with E-3.
B. Loss of 120v Vital Instrument Power Board 1-II	Use a pressurizer PORV in accordance with E-3.
C. Trip of the RCP #2	Transition to ECA-3.3, "SGTR without PZR Pressure Control" to allow use of auxiliary sprays.
D. Loss of 120v Vital Instrument Power Board 1-II	Transition to ECA-3.3, "SGTR without PZR Pressure Control" to allow use of auxiliary sprays.

Feedback

DISTRACTOR ANALYSIS:

- A. *Correct, the trip of the RCP #2 would leave only RCPs #1 and #3 running. For the spray to be effective, if RCP #2 is not running then the other 3 RCPs are to be running and if the sprays are not available, E-3 directs to use of a pressurizer PORV. There is a later note in E-3 (see below) identifying the potential of the sprays to be ineffective when RCP #2 off if all other RCPs are not in service.*

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- B. *Incorrect, the loss of the 120v AC Vital Instrument Power Board would not make the sprays ineffective (manual control of the Loop 1 spray would be available) and use of a PORV in accordance with E-3 is the action directed in E-3. Plausible because the loss of the 120v AC Vital Instrument Power Board would prevent operation of spray controls except for manual control of Loop 1 and the use of a PORV in accordance with E-3 is correct.*
- C. *Incorrect, the trip of the RCP #2 would make the sprays ineffective but use of the auxiliary sprays in accordance with ECA-3.3 is not the correct mitigating action. Plausible because the trip of RCP #2 making the sprays ineffective is correct and implementing ECA-3.3 is an action directed in the RNO column for when sprays are not available but would only be performed if other actions were unsuccessful and using the auxiliary spray is an action directed in the ECA as well as in E-3.*
- D. *Incorrect, the loss of the 120v AC Vital Instrument Power Board would not make the sprays ineffective (manual control of the Loop 1 spray would be available) and use of the auxiliary sprays in accordance with ECA-3.3 is not the correct mitigating action. Plausible because the loss of the 120v AC Vital Instrument Power Board would prevent operation of spray controls except for manual control of Loop 1 and implementing ECA-3.3 is an action directed in the RNO column for when sprays are not available but would only be performed if other actions were unsuccessful and using the auxiliary spray is an action directed in the ECA as well as in E-3.*

E-3

NOTE Loop 2 RCP and associated spray valve will provide adequate spray flow for RCS pressure control. If Loop 2 is not available, all three remaining RCPs may be required to ensure adequate spray flow.

AOP-P.03

APPENDIX B SIGNIFICANT IMPACTS FROM LOSS OF VIPB 1-II

1-M-4 (CONTINUED)
<ul style="list-style-type: none"> • Pressurizer level indicator 1-LI-68-335 fails. • Automatic pressurizer spray flow is unavailable due to loss of power to 1-R-15. • 1-PIC-68-340B Loop 2 Pzr Spray is unavailable until Train B Control air is restored to containment. Loop 1 Pressurizer Spray is available but Indicating Light (1-XI-68-340D) will not indicate when valve opens.

Notes

Question Number: 87

Tier: 2 Group 1

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K/A: 010 Pressurizer Pressure Control System (PZR PCS)
A2.02 Ability to (a) predict the impacts of the following malfunctions or operations on the PZR PCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:
Spray valve failures.

Importance Rating: 3.9 / 3.9

10 CFR Part 55: 41.5 / 43.5 / 45.3 / 45.13

10CFR55.43.b: 5

K/A Match: Applicant must determine the malfunction that would cause the pressurizer spray valves to be ineffective at reducing RCS pressure during an attempted RCS depressurization condition and how procedures would be used as a result of the condition to mitigate and control the plant.
SRO because the question requires assessing plant conditions and then prescribing a procedure to mitigate, recover, or with which to proceed.

Technical Reference: E-3, Steam Generator Tube Rupture, Revision 18
ECA-3.3, SGTR without PZR Pressure Control, Revision 4
AOP-P.03, Loss of Unit 1 Vital Instrument Power Board, Revision 23

Proposed references to be provided: None

Learning Objective: OPL271E-3
6. Given the procedure and a set of initial plant conditions, determine actions required to mitigate the event in progress.
7. Describe the conditions and reason for transitions within this procedure and transitions to other procedures.

Question Source:

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

Question History: WBN question 010 A2.02 087 used on the WBN 11/2009 exam with minor changes to make applicable for use on SQN 05/2013 exam

Comments:

88. 012 A2.05 088

Given the following plant conditions:

- Unit 1 at 100% power.
- An Eagle 21 malfunction has occurred that caused several annunciators to alarm and unexpected reactor trip bi-stables to be LIT.
- AOP-I.11, "Eagle 21 Malfunction," has been entered.
- 2 hours after the event, MIG is prepared to initiate work on the failure.

Which ONE of the following completes the statements below?

The crew will implement AOP-1.11, Section (1) to address the failure.

AOP-I.11 directs that the preferred action is to (2).

- A. (1) 2.1, Test Sequence Processor (TSP) Subsystem Failure
(2) hard trip bistables before attempting a system reset
- B. (1) 2.1, Test Sequence Processor (TSP) Subsystem Failure
(2) attempt a system reset before hard tripping bistables
- C. (1) 2.2, Loop Control Processor (LCP) Failure
(2) hard trip bistables before attempting a system reset
- D✓ (1) 2.2, Loop Control Processor (LCP) Failure
(2) attempt a system reset before hard tripping bistables

DISTRACTOR ANALYSIS:

- A. *Incorrect, the failure is not on the TSP (it is on the LCP) and the hard bi-stables should not be tripped prior to an attempted system reset. Plausible because the failure type would be on the TSP if no additional bi-stables were lit and because if there was not time enough to make the 6 hour T/S to have bi-stables tripped the bi-stables would be tripped prior to an attempted system reset.*
- B. *Incorrect, the failure is not on the TSP (it is on the LCP) but an attempt of a System Reset should be completed prior to tripping the hard bi-stables. Plausible because the failure type would be on the TSP if no additional bi-stables were lit and because the attempted system reset should be performed prior to tripping the bi-stables.*
- C. *Incorrect, the failure is on the LCP but the hard bi-stables should not be tripped prior to an attempted system reset. Plausible because the failure type is correct and because if there was not time enough to make the 6 hour T/S to have bi-stables tripped the bi-stables would be tripped prior to an attempted system reset.*
- D. *Correct, If bi-stables are LIT due to the failure, the failure is on the LCP and AOP-I.11 and the AOPs for instrument failure response have notes and cautions stating that the a System reset should be attempted prior to any bi-stables being hard tripped.*

Question Number: 87**Tier:** 2 **Group** 1

K/A: 012 Reactor Protection System
A2.05 Ability to (a) predict the impacts of the following malfunctions or operations on the RPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:
Faulty or erratic operation of detectors and function generators

Importance Rating: 3.1* / 3.2***10 CFR Part 55:** 41.5 / 43.5 / 45.3 / 45.5**10CFR55.43.b:** 5

K/A Match: This question matches the K/A by testing the candidates knowledge of how faulty or erratic operation of function generators within the Eagle 21 portion of RPS will affect plant operation and the correct procedure direction to mitigate the event. SRO due to detailed knowledge of AOP-I-11 and how to the subsections of the procedure will mitigate the event. Also the detailed instruction within the section to adequately trouble shoot the faulty signals.

Technical Reference: AOP-I-11, Eagle 21 Malfunction, Revision 12

Proposed references to be provided: None

Learning Objective: OPL271AOP-1.11
4. List the events in the diagnostic sections of AOP-I.11.
7. Given the procedure and a set of initial plant conditions, determine actions required to mitigate the event in progress.

Question Source:

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

Question History: SQN bank question 012 A2.05 088 used on the 1/2009 RETAKE exam with wording and format changes

Comments:

89. 025 G2.2.25 089

Given the following plant conditions:

- Unit 1 has been shutdown for a refueling outage.
- The surveillance for determining the Chemical Composition of the ice in the ice condensers is in progress.

Which ONE of the following completes the statements below in accordance with LCO 3.6.5.1, Ice Condenser Ice Bed?

The stored ice is required to have a MINIMUM boron concentration of (1) ppm as Sodium Tetraborate.

The bases for using Sodium Tetraborate in the ice is (2).

- | | <u>(1)</u> | <u>(2)</u> |
|----|------------|---|
| A. | 2000 | due to its effectiveness in maintaining the boron concentration for long storage periods and its enhancement of the ability of the solution to remove and retain fission product iodine |
| B✓ | 1800 | due to its effectiveness in maintaining the boron concentration for long storage periods and its enhancement of the ability of the solution to remove and retain fission product iodine |
| C. | 2000 | to minimize the occurrence of chloride and caustic stress corrosion on mechanical piping systems exposed to containment spray flow during recirculation mode of ECCS |
| D. | 1800 | to minimize the occurrence of chloride and caustic stress corrosion on mechanical piping systems exposed to containment spray flow during recirculation mode of ECCS |

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible because 2000 ppm is the minimum allowed boron concentration in the Spent Fuel Pit by Tech Spec and the bases stated is correct for the Ice Bed required boron concentration.*
- B. *Correct, LCO 3.6.5.1, Ice Condenser Ice Bed requires the boron concentration to be within a range of 1800 to 2500 ppm as Sodium Tetraborate and the bases identifies it is because of Sodium Tetraborates effectiveness in maintaining the boron concentration for long storage periods and its enhancement of the ability of the solution to remove and retain fission product iodine.*
- C. *Incorrect, Plausible because 2000 ppm is the minimum allowed boron concentration in the Spent Fuel Pit by Tech Spec and also because to minimize the occurrence of chloride and caustic stress corrosion on mechanical piping systems exposed to containment spray flow during recirculation mode of ECCS is the bases for the ph range required by the Ice Bed LCO.*
- D. *Incorrect, Plausible because 1800 ppm is the correct minimum allowed boron concentration required by the Ice Bed Tech Spec LCO and also because to minimize the occurrence of chloride and caustic stress corrosion on mechanical piping systems exposed to containment spray flow during recirculation mode of ECCS is the bases for the ph range required by the Ice Bed LCO.*

Question Number: 89**Tier:** 2 **Group** 1

K/A: 025 Ice Condenser
G2.2.25 Knowledge of the bases in Technical Specifications for the
limiting conditions for operations and safety limits

Importance Rating: 3.3 / 4.2**10 CFR Part 55:** 41.5 / 41.7 / 43.2**10CFR55.43.b:** 2

K/A Match: Question matches the K/A because it requires knowledge of the
bases in Technical Specifications for the LCO that governs the Ice
Condenser Ice Bed.

Technical Reference: LCO 3.6.5.1, Ice Condenser Ice Bed, Amendment 279,
September 30,2002

**Proposed references
to be provided:** None

Learning Objective: OPT200.ICE
12. Using the Technical Specifications and Technical
Requirements Manual:
b. EXPLAIN applicable Ice Condenser System LCO
and/or Technical Requirements bases,

Question Source:

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

Question History: New question for the SQN 05/32013 NRC exam.

Comments:

90. 073 A2.01 090

Given the following plant conditions:

- Both Units are at 100% RTP.
- SG specific activity is less than .01microCi/g Dose Equivalent I-131.
- Valve 0-40-783, LVWT overboard to diffuser pond ("L" valve) is OPEN.
- The Condensate Demineralizer Neutralizing tank is being discharged to the Turbine building sump.
- Alarm "0-RA-90-212B STA SUMP DISCH INSTR MALFUNC" (M12A-E-2) annunciates.
- The Turbine Bldg AUO reports that the breaker for RM-90-212 on 120 V AC Rad monitoring & Sampling Power Distribution panel 1 is OFF.

Which ONE of the following identifies the automatic valve response, if any, and the mitigating actions required to allow continued discharge of Turb Bldg Sump?

Note:

FCV-14-188 Neutralizing Tank Recirculation

FCV-14-187 Neutralizing Tank Overboard Discharge

<u>Automatic Response</u>	<u>Mitigating Action</u>
A. FCV-14-188 Opens & FCV-14-187 Closes	Notify Chem Lab to sample Turbine Bldg Sump at least every <u>12 hrs</u> per ODCM.
B. FCV-14-188 Opens & FCV-14-187 Closes	Notify Chem Lab to sample Turbine Bldg Sump at least every <u>24 hrs</u> per ODCM.
C. No response	Notify Chem Lab to sample Turbine Bldg Sump at least every <u>12 hrs</u> per ODCM.
D✓ No response	Notify Chem Lab to sample Turbine Bldg Sump at least every <u>24 hrs</u> per ODCM.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since high rad on the Cond DI Neutralizing tank discharge will cause the recirc valve to open and the overboard discharge to closed but an instrument malfunction on the Turb Bldg sump rad monitor will have no effect on the Cond DI Neutralizing tank valves. Also plausible since there is sample frequency requirements in the ODCM for this rad monitor being out of service. If the SG specific activity is greater than .01 microCi/g then the samples are to be drawn and analyzed at least every 12 hrs.*
- B. *Incorrect, Plausible since high rad on the Cond DI Neutralizing tank discharge will cause the recirc valve to open and the overboard discharge to closed but an instrument malfunction on the Turb Bldg sump rad monitor will have no effect on the Cond DI Neutralizing tank valves. Also the second part is correct IAW the ARP and ODCM. With activity less than .01 microCi/g then the sample frequency is set at every 24 hrs.*
- C. *Incorrect, Plausible since the first part is correct an instrument malfunction caused by a loss of power will not automatically trip the Turb Bldg sump pumps. Also plausible since there is sample frequency requirements in the ODCM for this rad monitor being out of service. If the SG specific activity is greater than .01 microCi/g then the samples are to be drawn and analyzed at least every 12 hrs.*
- D. *Correct, In accordance with ARP an instrument malfunction does not cause the Turbine Bldg Sump to automatically isolate. Also in accordance with the ARP and ODCM there is sample frequency requirements in the ODCM for this rad monitor being out of service. With SG specific activity less than .01 microCi/g then the samples are to be drawn and analyzed at least every 24 hrs.*

Question Number: 90**Tier:** 2 **Group** 1

K/A: 073 Process Radiation Monitoring
A2.01 Ability to (a) predict the impacts of the following malfunctions or operations on the PRM system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:
Erratic or failed power supply

Importance Rating: 2.5 / 2.9**10 CFR Part 55:** 41.5**10CFR55.43.b:** 5

K/A Match: This question matches the K/A by having the candidate assess the conditions of discharging from the Turbine Bldg sump when a rad monitor failure occurs and then based on those assumptions determine the actions required to mitigate or control the conditions. SRO level question because requires a detailed knowledge of the Alarm response procedure directions for a failed Rad Monitor and knowledge of actions in ODCM for a failed Rad monitor.

Technical Reference: 0-AR-M12-A E-1, E-2 rev 52
0-AR-M12-A D-1, D-2 rev 52
1,2 47W611-14-18 rev 8
SQN ODCM table 1.1-1 rev 58

Proposed references to be provided: None

Learning Objective: OPT200.RM obj. 4f, 5e

Question Source:

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

Question History: SQN question written for 1305 ILT exam

Comments:

91. 014 A2.04 091

Given the following plant conditions:

- Unit 1 was operating at 100%
- A turbine runback occurs due to a MFPT Trip.
- Prior to the runback, Control Rod D control rod the RPIs indications were:

<u>D-4</u>	<u>D-12</u>	<u>M-12</u>	<u>M-4</u>	<u>H-4</u>	<u>D-8</u>	<u>H-12</u>	<u>M-8</u>	<u>H-8</u>
212	224	218	220	224	219	220	217	224

- During the runback, Control Bank D control rod Group 2 step counter failed.
- After the plant was stabilized step counters 182/000 the RPIs indications are:

<u>D-4</u>	<u>D-12</u>	<u>M-12</u>	<u>M-4</u>	<u>H-4</u>	<u>D-8</u>	<u>H-12</u>	<u>M-8</u>	<u>H-8</u>
171	181	176	182	181	177	180	175	184

If the above conditions cannot be corrected, which ONE of the following identifies the action(s) that are currently required in accordance with Tech Specs?

Reference Provided

- A. Confirm non-indicating rod position using incore probes within the next 8 hours or be in Mode 3 within the next 6 hours.
- B. Place control rods in manual and record RCS Tavg at least once per hour and be in Mode 3 within the next 6 hours.
- C✓ Reduce Thermal Power to less than 50% of rated within 8 hours.
- D. Place control rods in manual and record RCS Tavg at least once per hour and reduce Thermal power to less than 50% of rated within 8 hours.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible because in accordance with T.S. 3.1.3.2 action a.2.a confirming non-indicating rod position using incore probes within the next 8 hours is correct for a RPI not working and if the candidate thinks that there is no action for the condition they could apply Tech Spec 3.0.3 and place the unit in Mode 3 within the next six hours.*
- B. *Incorrect, Plausible because placing rods in manual and recording Tavg each hour and placing the unit in Mode 3 within the next six hours are both conditions required where more than one RPI per bank is inoperable and if the candidate determines that rod D-4 RPI is inoperable then they would apply this spec.*
- C. *Correct, LCO 3.1.3.2 Action c requires the operators verify that all rod position indicators for the affected bank are OPERABLE (which they are) and that the most withdrawn rod and the least withdrawn rod of the bank are within a maximum of 12 steps (which they are not D-4 171 and H-8 184) at least least once per 12 hrs or reduce power to less than 50% within 8 hrs.*
- D. *Incorrect, Plausible because if the candidate determines that rod D-4 and rod H-8 RPI is inoperable then placing rods in manual and recording Tavg each hour is required and the reduction in power to less than 50% is correct for the conditions in the question.*

Question Number: 91**Tier:** 2 **Group** 2

K/A: 014 Rod Position Indication System (RPIS)
A2.04 Ability to (a) predict the impacts of the following malfunctions or operations on the RPIS; and (b) based on those on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:
Misaligned rod

Importance Rating: 3.4 / 3.9**10 CFR Part 55:** 41.5 / 43.5 / 45.3 / 45.13**10CFR55.43.b:** 2, 5

K/A Match: Question requires ability to determine that the control rods exceed the maximum allowed alignment deviation with one of the two group step counters failed and the ability to determine the Tech Spec required actions resulting from both the movement of the control rods and the misalignment of the rods as indicated by the RPIs.

Technical Reference: Unit 1 Tech Spec 3.1.3.2 Position Indication Systems - Operating, December 11, 2006

Proposed references to be provided: Tech Spec 3.1.3.2 pages 3/4 1-17 & 1-17a

Learning Objective: OPT200.TS-APP obj. 5

Question Source:

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

Question History: New question for the SQN 05/2013 exam

Comments:

92. 028 A2.03 092

Given the following plant conditions:

- A Reactor Trip and Safety Injection has occurred on Unit 1 due to a stuck open PZR safety valve.
- The operating crew transitioned from E-0, "Reactor Trip or Safety Injection," to E-1, "Loss of Reactor or Secondary Coolant."
- The crew is performing the step in E-1 to "Monitor if hydrogen igniters and recombiners should be turned on:"
- The Hydrogen Analyzers are in service and the containment hydrogen concentration is determined to be 5.2%.

Which ONE of the following completes the statements below?

An Appendix to place the Hydrogen Igniters in service would (1).

The CRO (2) directed to perform EA-268-1, "Placing Hydrogen Recombiners in Service."

- | <u>(1)</u> | <u>(2)</u> |
|--|--------------------|
| A. be first initiated during performance of E-1 | will be |
| B✓ have been initiated during performance of E-0 | will be |
| C. be first initiated during performance of E-1 | will NOT be |
| D. have been initiated during performance of E-0 | will NOT be |

Feedback

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since the step to place the hydrogen recombiners in service is in E-1, however when there is a stuck open PORV or PZR safety, the crew is directed to perform ES.05, Appendix D before transitioning to E-1. Also plausible since the second part is correct, with Hydrogen concentration below 6% and above .5% the CRO would be directed to place the recombiners in service.*
- B. *Correct, As directed by E-0, step 10, if there is a stuck open PZR PORV or Safety, the crew is directed to initiate ES-0.5 Appendix D prior to going to E-1. This is to allow for an early startup of the Hydrogen Mitigation System if conditions are such that a rapid build up of Hydrogen could occur. This is more likely in Ice Condenser plants due to the size of CNMT. Also in accordance with E-1, step 12, if CNMT Hydrogen concentration is less than 6% then the crew is directed to place the Hydrogen igniters in service. If the CNMT Hydrogen concentration is >.5% then the crew is also directed to place the Hydrogen Recombiners in service.*
- C. *Incorrect, Plausible since the step to place the hydrogen recombiners in service is in E-1, however when there is a stuck open PORV or PZR safety, the crew is directed to perform ES.05, Appendix D before transitioning to E-1. Also plausible if the candidate thinks that 4% would be the upper limit on CNMT Hydrogen vs the 6% that is established in the EOPs. 4% is the maximum Hydrogen concentration allowed in the Waste Gas System.*
- D. *Incorrect, Plausible since the first part is correct, If there is a stuck open PZR PORV or Safety, the crew is to implement ES-0.5, Appendix D before transitioning to E-1. Also plausible if the candidate thinks that 4% would be the upper limit on CNMT Hydrogen vs the 6% that is established in the EOPs. 4% is the maximum Hydrogen concentration allowed in the Waste Gas System.*

Notes

Question Number: 92Tier: 2 Group 2

K/A: 028 Hydrogen Recombiner and Purge Control System
A2.03 Ability to (a) predict the impacts of the following malfunctions or operations on the HRPS; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations:
The hydrogen air concentration in excess of limit flame propagation or detonation with resulting equipment damage in containment.

Importance Rating: 3.4 / 4.0

10 CFR Part 55: 43.5 / 45.13

10CFR55.43.b: 5

1305 NRC SRO Exam

K/A Match: This question matches the K/A by having the candidate determine when the Containment Hydrogen Mitigation Appendix is implemented and at what Hydrogen concentration the Hydrogen Recombiners and Igniters are allowed to be placed in service. SRO due to the detailed procedure knowledge and procedure selection criteria needed to mitigate the event.

Technical Reference: E-0, Reactor Trip or Safety Injection
EPM-3-E-0, Rev 16
E-1, Loss of Reactor or Secondary Coolant
ES-0.5 Equipment Verifications.

Proposed references to be provided: None

Learning Objective: OPL271E-0, rev 3
6. Given the procedure and a set of initial conditions, determine actions required to mitigate the event in progress.
7. Given a set of initial plant conditions, determine required procedural transitions per E-0.

Question Source:

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

Question History: SQN bank question, updated to current procedural guidance.

Comments:

93. 055 G 2.4.30 093

Given the following plant conditions:

- Unit 1 turbine load at 28%
- Condenser pressure is 1.79 psia and slowly increasing.
- Operators have entered AOP-S.02, "Loss of Condenser Vacuum."

Which ONE of the following completes the statements below?

The Unit Supervisor will direct the crew to ____ (1) ____ .

In accordance with NPG-SPP-03.5, "Regulatory Reporting Requirements," the Shift Manager is responsible to notify ____ (2) ____ .

- A. ✓ (1) Trip the turbine and GO TO AOP-S.06, "Turbine Trip."
(2) Site Operations management and the Duty Plant Manager, ONLY
- B. (1) Trip the turbine and GO TO AOP-S.06, "Turbine Trip."
(2) all TVA internal management listed in Appendix D, "Site Event Notification Matrix."
- C. (1) reduce Turbine load as necessary per AOP-C.03, "Rapid Shutdown or Load Reduction"
(2) Site Operations management and the Duty Plant Manager, ONLY
- D. (1) reduce Turbine load as necessary per AOP-C.03, "Rapid Shutdown or Load Reduction"
(2) all TVA internal management listed in Appendix D, "Site Event Notification Matrix."

DISTRACTOR ANALYSIS:

- A. *Correct, In accordance with AOP-S.02, with turbine load < 30%, the RNO column is used to evaluate procedure guidance. With condenser pressure > 1.7 psia the the crew is directed to trip the turbine an GO to AOP-S.06 Turbine Trip. Also in accordance with NPG-SPP-.03.5 Appendix D, for events/conditions that involve Reactor/Turbinegenerator trips the shift manager is responsible for notifying site operations management as well as the Duty Plant Manager. It is the Duty plant manager's responsibility to notify all remaining internal management personnel.*
- B. *Incorrect, Plausible since the first part is correct, the crew would be directed to Trip the Turbine and GO TO AOP-S.06. Also plausible as per the notification matrix, several internal management personnel would be required to be notified. However it the Duty Plant Manager's responsibility to notify all remaining personnel other than himself and the Site Operations management.*
- C. *Incorrect, Plausible because the candidate would have to analyze the conditions and may continue with AOP-S.02 direction and reduce turbine load to maintain condenser vacuum. Also plausible since the second part is correct, the shift manager is responsible for notifying Site Operations management and the Duty Plant Manager.*
- D. *Incorrect, Plausible because the candidate would have to analyze the conditions and may continue with AOP-S.02 direction and reduce turbine load to maintain condenser vacuum. Also plausible as per the notification matrix, several internal management personnel would be required to be notified. However it the Duty Plant Manager's responsibility to notify all remaining personnel other than himself and the Site Operations management.*

Question Number: 93**Tier:** 2 **Group** 2

K/A: 055 Condenser Air Removal
G 2.1.31 Ability to locate control room switches, controls and indications
and to determine that they are correctly reflecting the desired plant lineup.

Importance Rating: 4.6 / 4.3**10 CFR Part 55:** 41.10**10CFR55.43.b:** 5

K/A Match: Question matches the K/A by requiring the candidate to recall the correct equipment lineup associated with Condenser Vacuum pumps for conditions of decreasing condenser vacuum. SRO by assessing plant conditions and applying required knowledge as to whether the procedure transition would be to the turbine trip procedure or to the reactor trip procedure during a loss of condenser vacuum event.

Technical Reference: AOP-S.02, Loss of Condenser Vacuum, Revision 12
NPG-SPP-03.5, Regulatory Reporting Requirements rev
0005

**Proposed references
to be provided:** None

Learning Objective: OPL271AOP-S.02
6. Given the procedure and a set of initial plant
conditions, determine actions required to mitigate the
event in progress. O.F. Teamwork
OPL271NPG-SPP-03.5 obj 5

Question Source:

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

Question History: New question developed for 1305 NRC exam

Comments:

94. G 2.1.4 094

Given the following plant conditions:

- Both units are operating at 100% power and are staffed with the minimum allowed number of licensed operators on-site in accordance with OPDP-1, "Conduct of Operations."
- Shortly after shift change the crew realizes that both the OATC and the Unit Supervisor on Unit 1 have a 'no-solo' restriction on their license.
- None of the other license holders on shift have a 'no-solo' restriction on their license.

Which ONE of the following completes the statements below?

The current staffing on Unit 1 (1) .

In accordance with OPDP-1, if any of the currently on-shift licensed persons become incapacitated, the Shift Manager shall arrange for replacement personnel to restore the shift complement within a maximum of (2) hours.

- | | <u>(1)</u> | <u>(2)</u> |
|--------------------------|------------|------------|
| A✓ is allowed | | 2 |
| B. is allowed | | 4 |
| C. is NOT allowed | | 2 |
| D. is NOT allowed | | 4 |

DISTRACTOR ANALYSIS:

- A. *Correct, The "Operator Licensing Feedback Program" identifies that it is allowable for 2 'no solo' restricted individuals to back up each other and OPDP-1 identifies the 2 hours requirement to restore the minimum staffing level.*
- B. *Incorrect, Plausible because it being allowable for 2 'no solo' restricted individuals to back up each other is correct and 4 hours is used for other personnel time requirements such as if a represented employee reports for work a minimum of 4 hour pay will be awarded for any length of work as well as 4 hours is also used for other NRC reporting requirements such as a reactor trip..*
- C. *Incorrect, Plausible because it could be concluded that because if one became disabled the other would have no backup and 2 hours being the maximum time allowed to restore the staff staffing is correct.*
- D. *Incorrect, Plausible because it could be concluded that because if one became disabled the other would have no backup and 4 hours is used for other personnel time requirements such as if a represented employee reports for work a minimum of 4 hour pay will be awarded for any length of work as well as 4 hours is also used for other NRC reporting requirements such as a reactor trip.*

Question Number: 94**Tier:** 3 **Group** n/a

K/A: G 2.1 Conduct of Operations
2.1.4 Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, "no-solo" operation, maintenance of active license status, 10CFR55, etc.

Importance Rating: 3.3 / 3.8**10 CFR Part 55:** 41.10 / 43.2**10CFR55.43.b:** 1

K/A Match: K/A is matched because the question requires knowledge of the Tech Spec requirements for shift staffing, such as medical requirements and "no-solo" operation. Requires knowledge of Tech Spec and 10CFR50.54 requirements as they apply to MCR staffing.

Technical Reference: OPDP-1, Conduct of Operations, Revision 0023
10CFR05.54
Tech Spec 6.2.2, Amendment 266, February 16, 2001
NuReg-1021 Revision 9 Supplement 1 ES-605
Operator Licensing Feedback Program 02/01/12

Proposed references to be provided: None

Learning Objective: OPL271OPDP-10 obj. 4
OPL271OPSMGMTL obj 3

Question Source:

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

Question History: Bank question originally used on the SQN Dec 2012 NRC exam.

Comments:

95. G 2.2.17 095

Given the following plant conditions:

- Both Units are operating at 100% power.
- Maintenance activities require removing the A-A ERCW traveling screen from service to support diving operations.
- Both the J-A and K-A ERCW pumps will be tagged as part of the clearance.

Which ONE of the following identifies the minimum required Initial Risk Level classification and operability status of the 'A' Train ERCW Headers in accordance with NPG-SPP-07.3, "Work Activity Risk Management Process," and Tech Specs, respectively?

Minimum Required Risk LevelOperability Status

- | | | |
|----|-----------------|------------------------------|
| A. | Site High Focus | 'A' train ERCW is INOPERABLE |
| B. | Site High Focus | 'A' train ERCW is OPERABLE |
| C. | High | 'A' train ERCW is INOPERABLE |
| D✓ | High | 'A' train ERCW is OPERABLE |

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since there are maintenance activities that are considered Site High activities, however these activities are single point vulnerability or direct Reactor trip hazard type items. Diving operations are not considered Site High Risk activities (they are High Risk activities). Also the Train A ERCW is not inoperable as result of the diving activity even though 2 ERCW pumps are required to be removed from service to support the activity. Plausible because the Train A of ERCW will have 2 of the ERCW pumps removed from service.*
- B. *Incorrect, Plausible since there are maintenance activities that are considered Site High activities, however these activities are single point vulnerability or direct Reactor trip hazard type items. Diving operations are not considered Site High Risk activities (they are High Risk activities). Also the Train A ERCW does remain operable during the diving activity even though 2 ERCW pumps are required to be removed from service to support the activity. Plausible because there are activities designated as Site High Risk activities and the ERCW Train A remaining operable is correct.*
- C. *Incorrect, Plausible since diving operations are High Risk activities, however the Train A ERCW is not inoperable as a result of the diving activity even though 2 ERCW pumps are required to be removed from service to support the activity. Plausible because diving operations are considered High Risk activities and conditions on the Train A of ERCW will have 2 of the ERCW pumps removed from service.*
- D. *Correct, all diving operations are considered as High Risk activities in accordance with NPG-SPP-07.3 and in accordance with T.S. 3.7.4, the Train A of the ERCW system remains operable during the activity even though 2 of the ERCS pumps as well as the screen would be removed from service to support the diving activity.*

Question Number: 95**Tier:** 3 **Group** n/a**K/A:** G 2.2.17

Knowledge of the process for managing maintenance activities during power operations, such as risk assessments, work prioritization, and coordination with the transmission system operator.

Importance Rating: 2.6 / 3.8**10 CFR Part 55:** 41.10 / 43.5 / 45.13**10CFR55.43.b:** 5

K/A Match: Question requires knowledge of the responsibilities of SROs during the process by which risk assessments are properly conducted for maintenance activities to be performed with the unit(s) on-line.

Technical Reference: NPG-SPP-07.3, Work Activity Risk Management Process, Revision 0008
Tech Spec 3.7.4, Essential Raw Cooling Water System

Proposed references to be provided: None

Learning Objective: OPL271WMPI
8. In regards to the Work Management Schedule, be able to PERFORM the following:
e. DESCRIBE the method used for risk analysis.
OPT200.ERCW rev 7
obj. 11 d, f
obj. 14 c

Question Source:

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

Question History: SQN bank question G 2.2.17 with distractors A & B changed from Medium Risk to Site High Risk due to changes to NPG-SPP-07.3 procedure.

Comments:

96. G 2.2.36 096

Given the following plant conditions:

- Unit 1 is operating at 100% power with RHR pump 1B-B out of service and tagged.

0750 - DG 1A-A is determined to be inoperable.

0845 - 0-SI-OPS-082-007.W, "AC Electrical Power Source Operability Verification," is completed.

Which ONE of the following completes the statements below?

The 1A-A RHR pump ____ (1) ____.

0-SI-OPS-082-007.W must be completed by ____ (2) ____ to comply with Tech Specs.

- A✓ (1) must be declared INOPERABLE by 0950
(2) 1645
- B. (1) must be declared INOPERABLE by 0950
(2) 0845 the following day
- C. (1) remains operable
(2) 1645
- D. (1) remains operable
(2) 0845 the following day

DISTRACTOR ANALYSIS:

- A. *Correct,*
Plausible since the requirement of Tech Spec 3.0.5 could direct the operators to declare the 1A-A RHR pump INOPERABLE within 2 hrs if the EDG is Inoperable, however if the crew complies with the actions of 3.8.1.1 and verifies no other reason for the 1A-A RHR pump to be declared INOPERABLE then the pump remains operable. Also plausible since the time to perform the surveillance is correct.
- B. *Incorrect, Plausible since the requirement of Tech Spec 3.0.5 could direct the operators to declare the 1A-A RHR pump INOPERABLE within 2 hrs if the EDG is Inoperable, however if the crew complies with the actions of 3.8.1.1 and verifies no other reason for the 1A-A RHR pump to be declared INOPERABLE then the pump remains operable. Also plausible since the EDGs are to be operated to verify that no common mode failure exists within 24 hours, however to comply with the guidance of 3.8.1.1, 0-SI-OPS-82-007.W must be run within 1 hour and every 8 hours there after.*
- C. *Incorrect,*
In accordance with Tech Spec 3.0.5, a component may remain OPERABLE if the only reason its being declared INOPERABLE is due to its emergency power supply being declared inoperable. Thus 1A-A RHR pump would remain Operable for these conditions. Also, 0-SI-OPS-082-007.W, is required to be performed within 1 hr and every 8 hrs until the EDG is returned to service.
- D. *Incorrect, Plausible since the first part is correct, the 1A-A RHR pump would remain OPERABLE for these conditions. Also plausible since the EDGs must be run to demonstrate a non-common-mode-failure condition within 24hrs, however 0-SI-OPS-082-007.W, must be performed within 1 hr and every 8 hrs there after.*

Question Number: 96**Tier:** 3 **Group** n/a

K/A: G 2.2.36
Equipment Control
Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.

Importance Rating: 3.1 / 4.2**10 CFR Part 55:** 41.10 / 43.2 / 45.13**10CFR55.43.b:** 2

K/A Match: KA is matched because the question requires knowledge of how maintenance activities and degraded power sources affect LCO status and required actions.

Technical Reference: 0-SI-OPS-82-007.W, AC Electrical Power Source
Operability Verification, Revision 0025
Tech Spec LCO 3.8.1.1, AC Sources - Operating,
Amendment 241
Tech Spec 3.0, Applicability, 3.0.5, Amendment 312

**Proposed references
to be provided:** None

Learning Objective: OPL200.TS-APP rev 0
1. Given operating circumstances, apply Technical
Specification 3.0.1 through 3.0.7

Cognitive Level:

Higher	<u>X</u>
Lower	<u> </u>

Question Source:

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

Question History: Modified Bank Question from WBN 06, 2011 Exam

Comments: Modified original question by changing question statement and changing distractors to match plant Tech Specs, this changed the distractors and changed answer from B to C.

97. G 2.3.6 097

Given the following plant conditions:

- Rad Waste water inventory is approaching storage capacity.
- A release of the Monitor Tank is planned.
- Sample results indicate non gaseous activity in the tank is slightly higher than the $7.0\text{E-}6$ $\mu\text{Ci/ml}$ value listed in O-SI-CEM-077-400.1, "Liquid Waste Effluent Batch Release," for opening a Batch Release Permit.
- The source check on O-RM-90-122, "Liquid Radwaste Release Monitor," has failed and the monitor has been declared Inoperable.
- Chemistry Department Manager has granted approval of the release.

Which ONE of the following completes the statement below in accordance with O-SI-CEM-077-400.1?

Provided ODCM compliance is maintained, the release is _____.

- A. ☒ permitted only after Shift Manager obtains the Operations Superintendent approval
- B. ☐ permitted by US/SRO without any additional required signature needed for approval
- C. ☐ **NOT** permitted until contents of the Monitor Tank is reprocessed to lower activity
- D. ☐ **NOT** permitted until O-RM-90-122 has been returned to an OPERABLE status

DISTRACTOR ANALYSIS:

- A. *Correct, In accordance with ODCM 1.1.1, Action 30 an effluent release may continue provided; 2 Independent samples of tank contents are analyzed, 2 Independent discharge valve alignment verifications, and 2 Independent release rate calculations are verified per ODCM 1.1.1. Also the high activity level requires Operations Superintendent approval for release.*
- B. *Incorrect, 2 Independent samples of tank contents are analyzed, 2 Independent discharge valve alignment, 2 Independent release rate calculations are verified per ODCM 1.1.1. The high activity level requires Operations Superintendent approval for release. Plausible is student does not know requirement to have Operations Superintendent approval for releasing tank with high activity levels.*
- C. *Incorrect, 2 Independent samples of tank contents are analyzed, 2 Independent discharge valve alignment, 2 Independent release rate calculations are verified per ODCM 1.1.1. High activity level requires SM approval for release. Plausible because the US/SRO can authorize the release without additional Operations approval during most release and may not know the implication of the $\mu\text{Ci/ml}$ value listed in 0-SI-CEM-077-400.1.*
- D. *Incorrect, 2 Independent samples of tank contents are analyzed, 2 Independent discharge valve alignment, 2 Independent release rate calculations are verified per ODCM 1.1.1. High activity level requires SM approval for release. Plausible if student believes that to release a tank with high activity it would require active monitoring during the release.*

Question Number: 97**Tier:** 3 **Group** n/a**K/A:** G 2.3 Radiation Control
G 2.3.6 Ability to approve release permits.**Importance Rating:** 2.0 / 3.8**10 CFR Part 55:** 41.3 / 43.4 / 45.10**10CFR55.43.b:** 4**K/A Match:** Question requires knowledge of the process for gaseous/liquid release approvals, i.e., release permits.**Technical Reference:** 0-SI-CEM-077-400.1 rev 0050
ODCM 1.1.1 rev 58**Proposed references to be provided:** None**Learning Objective:** OPT200.LRW rev 5
13. Using the Offsite Dose Calculation Manual:
b. Explain the applicable Liquid Radwaste System actions and requirements.**Question Source:**

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

Question History: SQN bank question G 2.3.6 098 used on the SQN 1/2008 exam changed to a different format and revision to reflect procedure revision.**Comments:**

98. G 2.3.7 098

Given the following plant conditions:

- Both Units are operating at 100% RTP.
- A diving operation in the Spent Fuel Pit is planned to commence later in the shift.

Which ONE of the following completes the statements below?

If the rad level in the area of the dive is estimated at 62 Rad/hr, in accordance with RCI-14, "Radiation Work Permit (RWP) Program," the Plant Manager (1) required to approve the RWP.

While inspecting the spent fuel rods, the diver receives a gash to his head which will require stitches, the resulting event would be a (2) reportable event in accordance with NPG-SPP-03.5, "Regulatory Reporting Requirements."

Reference Provided

<u>(1)</u>	<u>(2)</u>
A. is NOT	4 hour
B. is	4 hour
C. is NOT	8 hour
D. is	8 hour

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible, because for values of < 50 rad/hr the Radiation Protection manager would be the only approval that is required. Also plausible since a candidate may think that this event would be classified as a 4 hr report since an event (such as a fatality) would be listed. The candidate may think that any medical emergency would be all classified the same.*
- B. *Incorrect, Plausible since the RADIATION WORK PERMIT (RWP) PROGRAM identifies 'The Plant Manager and Radiation Protection Manager must approve in writing entries into areas where whole body dose rates are = 50 Rad/hour. Also plausible since an event under section C.4. is considered a 4 hour reportable event.*
- C. *Incorrect, Plausible, since for values of < 50 rad/hr the Radiation Protection manager would be the only approval that is required. Also plausible since the reporting requirements of 8 hrs is correct in accordance with NPG-SPP-03.5.*
- D. *Correct, **RADIATION WORK PERMIT (RWP) PROGRAM** identifies 'The **Plant Manager** and **Radiation Protection Manager** must approve in writing entries into areas where whole body dose rates are = **50 Rad/hour**. Also in accordance with NPG-SPP-03.5, 3.1.D.5 "Any event requiring the transport of a radioactively contaminated person to an offsite medical facility for treatment" is classified as an 8 hr Immediate Notification - NRC report.*

Question Number: 98**Tier:** 3 **Group** n/a**K/A:** G2.3.7 Radiation Control
Ability to comply with radiation work permit requirements during normal or abnormal conditions.**Importance Rating:** 3.5 / 3.6**10 CFR Part 55:** 41.12 / 45.10**10CFR55.43.b:** 4**K/A Match:** This question matches the K/A by testing the candidates knowledge of the RWP requirements for entry into high radiation areas and SRO level by testing the candidates knowledge of the NRC reporting requirements for individuals who are contaminated and need to be transported to an off-site facility.**Technical Reference:** NPG-SPP-03.5, Regulatory Reporting Requirements, Rev. 0005
RCI-14, Radiation Work Permit (RWP) Program, Revision 0052**Proposed references to be provided:** NPG-SPP-03.5, Appendix A (pages 19-31)**Learning Objective:** OPL271SPP-3.5 rev 0
obj. 3 & 4**Question Source:**

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

Question History: Sequoyah bank question used on 1201 exam with the stem changed to incorporate NRC reporting requirements vs Risk assessment. Also changed answer to "D"**Comments:**

99. G 2.4.18 099

Given the following plant conditions:

- A loss of all offsite power has occurred.
- 2A 6.9kV shutdown board is energized by its respective diesel generator.
- The other 6.9kV shutdown boards have no power.
- Offsite power restoration is estimated to be complete in 5 hours.
- The Unit 1 US is directing unit response per ECA-0.0, "Loss of All AC Power."

Which ONE of the following identifies:

- (1) required actions to shed DC loads in accordance with ECA-0.0,
and
- (2) the basis for leaving the turbine emergency oil pump in service for 3 hours when shedding 250V DC loads?

Note:

EA-250-1, "Load Shed of Vital Loads After Station Blackout"

EA-250-2, "Load Shed of 250V DC Loads After Station Blackout"

- A. (1) Perform EA-250-1, ONLY.
(2) To prevent potential for a fire or explosion due to hydrogen loss from the main generators.
- B. (1) Perform EA-250-2, ONLY.
(2) To ensure turbine is at zero speed and sufficient turbine heat load has been dissipated from the main turbines.
- C. (1) Perform BOTH EA-250-1 and EA-250-2.
(2) To prevent potential for a fire or explosion due to hydrogen loss from the main generators.
- D✓ (1) Perform BOTH EA-250-1 and EA-250-2.
(2) To ensure turbine is at zero speed and sufficient turbine heat load has been dissipated from the main turbines.

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible to perform only EA-250-2 because one of the Shutdown boards is available to allow charging of one of the 125v Vital batteries and the requirement to open the DC air side seal oil pump breakers within 90 minutes is to prevent a fire or an explosion due to hydrogen leakage is the basis for de-pressurizing the main generator prior to load shedding the DC air side Seal Oil pumps.*
- B. *Incorrect, Plausible to perform only EA-250-2 because one of the Shutdown Boards is available to allow charging of one of the 125v Vital batteries and the basis for the 3 hour time limit to load shed the 250v DC Turbine Emergency Oil Pump is to ensure sufficient turbine heat load has been dissipated from the main turbines is correct.*
- C. *Incorrect, Plausible because performing both EA-250-1 and EA-250-2 is correct and the requirement to open the DC air side seal oil pump breakers within 90 minutes is to prevent a fire or an explosion due to hydrogen leakage is the basis for de-pressurizing the main generator prior to load shedding the air side Seal Oil pumps.*
- D. *Correct, In accordance with ECA-0.0, the conditions (3 shutdown boards de-energized) require both EA-250-1 and EA-250-2 to be performed. Also the basis for the 3 hour time limit to load shed the 250v DC Turbine Emergency Oil Pump is to ensure sufficient turbine heat load has been dissipated from the main turbines.*

Notes

Question Number: 99**Tier:** 3 **Group** n/a**K/A:** G 2.4.18 Knowledge of the specific bases for EOPs.**Importance Rating:** 3.3 / 4.0**10 CFR Part 55:** 41.10 / 43.1 / 45.13**10CFR55.43.b:** 5**K/A Match:** Specific knowledge of the bases for EOP's as related to the loss of DC power. SRO because it requires selection of the appropriate procedure that needs to be performed.**Technical Reference:** ECA-0.0, Loss of All AC Power, Rev. 23
EPM-3-ECA-0.0, Basis Document for ECA-0.0 Loss of All AC Power, Rev 11; EA-250-1 Load Shed of Vital Loads After Station Blackout" Rev 14; EA-250-2, Load Shed of 250V DC Loads After Station Blackout, Rev. 9**Proposed references to be provided:** None**Learning Objective:** OPT200.DC Obj B ;
OPL271ECA-0.0 Obj B 4.**Cognitive Level:**

Higher	<u>X</u>
Lower	<u> </u>

Question Source:

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

Question History: SQN bank question**Comments:**

100. G 2.4.29 100

Given the following plant conditions:

- Both Units are at 100% power.
- An evaluation of EPIP-1, "Emergency Plan Classification Matrix," determines that the conditions for an NOUE were initially met, but are now fully resolved.

In accordance with EPIP-1, the SED is to ____ (1) ____ and notification is required to be made to the ____ (2) ____.

- A. (1) report but not declare the event
(2) State of Tennessee and the NRC
- B✓ (1) report but not declare the event
(2) NRC only
- C. (1) declare and terminate the event at the same clock time
(2) State of Tennessee and the NRC
- D. (1) declare and terminate the event at the same clock time
(2) NRC only

DISTRACTOR ANALYSIS:

- A. *Incorrect, Plausible since the first part is correct, in accordance with EPIP-1, the event is not to be declared but is to be reported. Also plausible since when an event is identified, it is to be declared and then notification is made to the State of Tennessee within 15 minutes and then immediately notify the NRC (however this notification must be made within 1 hr.).*
- B. *Correct, In accordance with EPIP-1, 3.1.M if an EAL was exceeded, but the emergency has been totally resolved (prior to declaration), the emergency condition that was appropriate shall not be declared but reported to the NRC within one hour using NPG-SPP-03.5, Reg Reporting Requirements. In accordance with EPIP-1 the State of Tennessee is only required to be notified if an EAL is actually declared, thus only the NRC is required to be notified for this condition. The state is not required to be notified.*
- C. *Incorrect, Plausible since the guidance in EPIP-1 that when an EAL for a higher classification was exceeded but current conditions indicate a lower classification, the higher classification is to be reported to the NRC and CECC. The candidate may recall that these notifications would be required. Also plausible since normally during any event the State of Tennessee is to be notified within 15 min and then immediately the NRC is notified.*
- D. *Incorrect, Plausible since the guidance in EPIP-1 that when an EAL for a higher classification was exceeded but current conditions indicate a lower classification, the higher classification is to be reported to the NRC and CECC. Also the second part is correct, only the NRC would be required to be notified for this condition.*

Question Number: 10**Tier:** 3 **Group** n/a**K/A:** G 2.4 Emergency Procedures / Plans
2.4.29 Knowledge of the emergency plan.**Importance Rating:** 3.1 / 4.4**10 CFR Part 55:** 41.10 / 43.5 / 45.11**10CFR55.43.b:** 5**K/A Match:** This question matches the K/A by having the candidate determine the reporting requirements for the event in accordance with the NP Radiological Emergency Plan and the SQN Emergency Plan Implementing Procedures.**Technical Reference:** EPIP-1, Emergency Plan Classification Matrix,
Revision 46**Proposed references
to be provided:** None**Learning Objective:** OPL271REP rev 4
2. Determine the required notifications based upon the event, including time requirements.**Question Source:**

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

Question History: Watts Bar bank question G 2.4.29 100 used on the WBN 05/2008 NRC exam made minor changes to make applicable for SQN.**Comments:****You have completed the test!**