

OCONEE NRC RO EXAM  
03-20-2008

1 POINT

Question 1

Unit 1 initial conditions:

- Reactor trip from 100%
- ALL RCPs OFF
- BOTH Main FDW pumps operating
- 1FDW-38 CLOSED
- 1FDW-36 OPEN
- 1FDW-47 OPEN
- 1FDW-45 CLOSED

Current conditions

- 1FDW-38 can not be repositioned

Based on the above conditions, which ONE of the following describes the actions regarding Main FDW pumps and the minimum level (inches) at which the Pzr will be controlled?

In accordance with Subsequent Actions tab of the EOP the operator will trip...

- A. ONE Main FDW pump and control Pzr level > 100
- B. ONE Main FDW pump and control Pzr level > 180
- C. BOTH Main FDW pumps and control Pzr level > 100
- D. BOTH Main FDW pumps and control Pzr level > 180

Question 1

**T1/G1**

BW/E02EK2.1 Reactor Trip - Stabilization - Recovery / 1

**Knowledge of the interrelations between the () and the following:** Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features. (3.8/4.0)

**K/A MATCH ANALYSIS**

Question requires knowledge of EOP Subsequent Actions (Vital System Status Verification) with a failure of the FDW system.

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect, first part is incorrect. Plausible because SA will direct tripping one Main FDW pump if the FDW valves align properly. Second part is correct.
- B. Incorrect, first part is incorrect. Plausible because SA will direct tripping one Main FDW pump if the FDW valves align properly. Second part is incorrect but plausible because this is normal post trip ACC Pzr level.
- C. Correct, with NO RCPs operating SA verifies FDW has automatically aligned flow through the AUX nozzles. If this has not occurred the Main FDW pumps are tripped and Rule 3 is initiated. In the stem the "A" SG valves did not swap. SA verifies that if ES is not required then Pzr and LDST inventory will be maintained by Encl. 5.5 (Pzr and LDST Level Control). Encl, 5.5 directs Pzr level to be controlled >100 inches.**
- D. Incorrect, first part is correct. Second part is incorrect but plausible because this is normal post trip ACC Pzr level.

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Technical Reference(s): **EOP Subsequent Actions Rev 36**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-SA R5**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**Changed as suggested.>>> GL OK**

**1 POINT**

**Question 2**

Unit 1 plant conditions:

- Reactor power = 100%
- Pzr code safety valve is suspected of having steam blowing past its seat.
- Pzr temperature = 648 °F
- Quench tank pressure = 5 psig

Based on plant conditions, which ONE of the following describes the expected temperature downstream of the Pzr code safety valve and why?

- A. 228 °F  
Because leakage past a valve is a constant enthalpy process
- B. 162 °F  
Because leakage past a valve is a constant enthalpy process
- C. 228 °F  
Because leakage past a valve is a constant entropy process
- D. 162 °F  
Because leakage past a valve is a constant entropy process

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Question 2

**T1/G1**

008AK3.02 Pressurizer Vapor Space Accident / 3

**Knowledge of the reasons for the following responses as they apply to the Pressurizer Vapor Space Accident: Why PORV or code safety exit temperature is below RCS or PZR temperature. (3.6/4.1)**

**K/A MATCH ANALYSIS**

Requires knowledge of constant enthalpy processes and reasons for parameter changes.

**ANSWER CHOICE ANALYSIS**

**Answer: A**

- A. Correct: The enthalpy for the steam leaving the pressurizer at 648 °F will be the same at 5 psig (20psia). This enthalpy at 20 psia constitutes a wet vapor with a temperature of 228 °F. Throttling processes are constant enthalpy processes and energy remains approximately the same on both sides of a throttling process.**
- B. Incorrect: first part is incorrect. Plausible because this will be the answer if 5 psig is not converted to psia. Second part is correct.
- C. Incorrect: first part is correct. Plausible because this will be the answer if 5 psig is not converted to psia. Second part is incorrect. The throttling process is not a constant entropy process.
- D. Incorrect: both parts are incorrect.

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Technical Reference(s): **TH04 Rev 4**

Proposed references to be provided to applicants during examination: **Steam Tables**

Learning Objective: **TH04 Obj 29,30,31**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**Changed as suggested. >>>Deleted after and on all answers. GL OK.**

**1 POINT**

**Question 3**

Unit 1 plant conditions:

Time = 1700

- Reactor power = 100%

Time = 1701

- Reactor tripped due to a SBLOCA

Time = 1706

- RCS pressure = 425 psig slowly decreasing
- All SCMs = 0°F and stable
- HPI header A flow = 478 gpm and stable
- 1A and 1B HPI pumps operating
- 1C HPI pump breaker failed open

Based on the above conditions, which ONE of the following describes what valve must be opened and what flow limit is in effect in accordance with Rule 2 (Loss of SCM)?

- A. Open 1HP-409 and ensure total HPI flow is  $\leq 950$  gpm
- B. Open 1HP-409 and ensure total HPI flow is  $\leq 750$  gpm
- C. Open 1HP-410 and ensure total HPI flow is  $\leq 950$  gpm
- D. Open 1HP-410 and ensure total HPI flow is  $\leq 750$  gpm

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Question 3

**T1/G1**

009EA1.18 Small Break LOCA / 3

**Ability to operate and monitor the following as they apply to a small break LOCA:  
Balancing of HPI loop flows (3.4\*/3.2\*)**

**K/A MATCH ANALYSIS**

Question requires evaluating the plant following a SBLOCA and determining how HPI header flow must be controlled.

**ANSWER CHOICE ANALYSIS**

**Answer: A**

- A. Correct, Rule 2 provides guidance if no flow in the "B" HPI header to open 1HP-409. In addition, if 1A & 1B HPI pumps operating with 1HP-409 open, do not exceed 950 gpm total.**
- B. Incorrect, first part is correct. Second part is incorrect. Plausible because this is the limit on HPI flow if only one LPI to HPI flow path exists while in piggy back operation.
- C. Incorrect, first part is incorrect. Plausible because the higher number valve would normally go to the "B" header. Second part is correct.
- D. Incorrect, first part is incorrect. Plausible because the higher number valve would normally go to the "B" header. Second part is incorrect. Plausible because this is the limit on HPI flow if only one LPI to HPI flow path exists while in piggy back operation.

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Technical Reference(s): **EOP Rule 2 (Loss of SCM) Rev 36**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-LOSCM R14**

Question Source: **Bank EAP061401**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

>>> Added IAW to stem. GL OK

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**1 POINT**

**Question 4**

Which ONE of the following describes the maximum RB pressure (psig) that will allow securing the RBS system and why it should be secured within 24 hours of the event in accordance with the EOP LOCA CD tab?

- A. < 3  
Minimize boric acid corrosion of electrical components in containment
- B. < 3  
Minimize the amount of water recirculating outside of containment to reduce dose to the public
- C. < 10  
Minimize boric acid corrosion of electrical components in containment
- D. < 10  
Minimize the amount of water recirculating outside of containment to reduce dose to the public

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Question 4

**T1/G1**

011EA2.08 Large Break LOCA / 3

**Ability to determine or interpret the following as they apply to a Large Break**

**LOCA:** Conditions necessary for recovery when accident reaches stable phase

(3.4\*/3.9\*)

**K/A MATCH ANALYSIS**

Question requires knowledge of recovery actions contained in the EOP following a LBLOCA.

**ANSWER CHOICE ANALYSIS**

**Answer: A**

- A. Correct, per the LOCA CD tab RB pressure < 3 psig and this helps minimize corrosion to electrical components.**
- B. Incorrect, first part is correct. Second part is incorrect. Per FSAR 15.15.4 additional source of fission products outside of the RB can be due to ECCS piping leakage. This is controlled by reducing piping leakage rather than limiting RBS operation.
- C. Incorrect, first part is incorrect. Plausible because the pressure is below the RBS ES setpoint of 10 psig. Second part is correct.
- D. Incorrect, both parts are incorrect.

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Technical Reference(s): **EOP LOCA CD Tab Rev 36**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-LCD R8**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**GL OK - - Rewrote question to remove SRO knowledge component and to ensure knowledge level only. - GL OK**

**1 POINT**

**Question 5**

Unit 2 plant conditions:

- Reactor power = 20% and stable
- Statalarms actuated:
  - 2SA-9/D2 (RCP VIBRATION HIGH) actuated
  - 2SA-16/D2 (RC Pump Motor 2B1 Oil Pot Low Level) actuated
- All RCPs seal leakage flow = 0 gpm

2B1 RCP parameters:

- SEAL RETURN FLOW = 4.0 gpm
  
- HIGHEST VIBRATIONS
  - Motor shaft = 3.2 mils
  - Spool piece = 17.6 mils
  - Upper bearing = 17.3 mils
  
- SEAL RETURN TEMPERATURE = 186°F increasing
  
- OIL POTS
  - Upper - Level = +.22" steady and Temperature = 108°F steady
  - Lower - Level = -1.3" decreasing and Temperature = 113°F increasing
  
- MOTOR BEARING TEMPERATURE
  - Upper Guide = 130°F decreasing
  - Lower Guide = 205°F increasing
  - Thrust = 140°F steady

Based on the above conditions, which ONE of the following describes why the 2B1 RCP should be tripped immediately?

- A. High seal return flow
- B. High sustained vibration
- C. Seal return temperature increasing
- D. Motor lower guide bearing temperature increasing

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Question 5

**T1/G1**

015/17G2.4.49 RCP Malfunctions / 4

**Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. (4.6/4.4)**

**K/A MATCH ANALYSIS**

Question requires knowledge of RCP immediate trip criteria.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect - With the current conditions, high seal return flow does not warrant an immediate RCP trip although this answer would be correct if seal leakage was high and not 0 gpm.
- B. Incorrect - With the current conditions, high vibration does not warrant an immediate RCP trip although if the vibration indication were an emergency high vibration condition this answer would be correct.
- C. Incorrect - Seal temperature would be need to be > 200°F for this to meet the criteria for an immediate RCP trip.
- D. Correct - lower bearing temperature > 190°F meets immediate RCP trip condition of AP/16, Abnormal RCP Operation.**

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Technical Reference(s): **AP/16 (Abnormal RCP Operation) Rev 18**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-APG R7**

Question Source: **Bank EAP210701**

Question History: Last NRC Exam

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**Modified "D" to agree with procedure nomenclature. >>> GL OK**

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**1 POINT**

**Question 6**

Unit 1 initial conditions:

- Reactor power = 100%

Current conditions:

- 1HP-120 (RC VOLUME CONTROL) air line is severed

Based on the above conditions, which ONE of the following describes the initial Pzr level change and the valve that will be used to control Pzr level?

- A. increase / 1HP-26
- B. increase / 1HP-410
- C. decrease / 1HP-26
- D. decrease / 1HP-410

Question 6

**T1/G1**

022AK1.03 Loss of Rx Coolant Makeup / 2

**Knowledge of the operational implications of the following concepts as they apply to Loss of Reactor Coolant Makeup:** Relationship between charging flow and PZR level (3.0/3.4)

**K/A MATCH ANALYSIS**

Question requires knowledge of how 1HP-120 fails on loss of IA and how this will affect charging flow which in turn will determine PZR level.

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect, first part is incorrect. Plausible and would be true if 1HP-120 failed open on loss of air. 1HP-31 does fail open on a loss of IA. Second part is correct.
- B. Incorrect, first part is incorrect. Plausible and would be true if 1HP-120 failed open on loss of air. 1HP-31 does fail open on a loss of IA. Second part is incorrect. Plausible because 1HP-410 is used to control "A" HPI injection flow if 1HP-26 was failed closed during an ES.
- C. Correct, 1HP-120 will fail closed on a loss of IA. This will result in no HPI makeup flow which will cause the PZR level to decrease. AP/14 (Loss of Normal HPI Makeup and/or RCP Seal Injection) will direct the used of 1HP-26 to control Pzr level.**
- D. Incorrect, first part is correct. Second part is incorrect. Plausible because 1HP-410 is used to control "A" HPI injection flow if 1HP-26 was failed closed during an ES.

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Technical Reference(s): **AP/14 (Loss of Normal HPI Makeup and/or RCP Seal Injection) Rev 15**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **SSS-IA R48**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**Changed as suggested. GL OK**

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**1 POINT**

**Question 7**

Unit 1 plant conditions:

- A load rejection caused an RCS Pressure spike
- Pressurizer spray valve failed to fully reseal
- RCS pressure = 2145 psig decreasing slowly

Based on the above conditions, which ONE of the following lists ALL of the banks of Pressurizer Heaters that are energized?

- A. Bank 1 and 2 ONLY
- B. Banks 1 and 3 ONLY
- C. Banks 1, 2 and 3 ONLY
- D. Banks 1, 2, 3 and 4

Question 7

**T1/G1**

027AA1.03 Pressurizer Pressure Control System Malfunction / 3  
**Ability to operate and / or monitor the following as they apply to the Pressurizer Pressure Control Malfunctions:** Pressure control when on a steam bubble (3.6/3.5)

**K/A MATCH ANALYSIS**

Demonstrates monitoring of the alarm setpoint vs. auto actuation setpoints for all Pressurizer Heaters.

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect, Bank 1 and 3 would be energized.
- B. Correct, Banks 1 and 3 are all below RCS pressure of 2145 PSIG. 2145 is the setpoint for group 3.**
- C. Incorrect, Plausible because Banks 1 and 3 would be energized.
- D. Incorrect, Plausible as the pressure given is at the pressure at which Bank 4 would turn off however, Bank 4 turn on setpoint has not been reached

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Technical Reference(s): **Lesson Plan PNS-PZR, Pg. 36 Rev 16a**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **PNS-PZR R5**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**GL OK**

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**1 POINT**

**Question 8**

Unit 1 initial conditions:

- Reactor power = 78%
- 1A SG has a 56 gpm tube leak
- Unit shutdown in progress

Current conditions:

- Reactor power = 4% decreasing
- TBVs have failed closed
- 1A SG level = 36 inches SUR increasing slowly
- 1B SG level = 23 inches SUR increasing slowly
- An NEO is using the ADVs to control Turbine Header Pressure at 885 psig

Subsequently, the reactor is manually tripped as directed by procedure.

Which ONE of the following describes the required action of the NEO at the ADVs immediately following the reactor trip and why?

- A. 1B ADV must be throttled in the closed direction to increase 1B SG level
- B. Both ADVs must be throttled in the closed direction to stabilize MS pressure
- C. 1A ADV must be throttled in the open direction to prevent 1A SG overflow
- D. Both ADVs must be throttled in the open direction to prevent lifting the MSRVs

Question 8

**T1/G1**

038G2.4.35 Steam Generator Tube Rupture / 3

**Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects. (3.8/4.0)**

**K/A MATCH ANALYSIS**

Question tests knowledge of the operator controlling ADVs during a SGTR shutdown.

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect, ADV would not be used to increase the SG level. Plausible because reducing the steaming rate would aid in mitigating low SG Level.
- B. Correct, due to the reduction in heat from the reactor after the trip the ADVs must be throttled closed to stabilize the plant.**
- C. Incorrect, SG level is high but not near the overfill level. Plausible because the SG would be steamed if near the overfill level.
- D. Incorrect, due to the reduction in heat from the reactor after the trip the ADVs must be throttled closed to stabilize the plant. Plausible because steam pressure is reduced to prevent the MSRVS from lifting.

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Technical Reference(s): **EOP SGTR Tab Rev 36**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-SGTR R3**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**GL OK --- Modified stem and answers to insure only one correct answer. Added "in the closed direction" to each answer. Modified "B". – GL OK**

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1 POINT

Question 9

Unit 1 plant conditions:

Time = 10:00:00

- Reactor power = 100%
- 1A MD EFDW pump OOS
- 1SA2/A9 (MS PRESS HIGH/LOW) alarms

Time = 10:00:20

- 1A SG pressure = 905 psig decreasing
- 1B SG pressure = 62 psig decreasing
- RB pressure = 3.6 psig increasing
- Core SCM has decreased to 3°F and is now increasing

Based on the above conditions, which ONE of the following describes level (XSUR) at which 1A SG will be controlled 30 minutes from now?

1A SG will be controlled...

- A. automatically at 30".
- B. automatically at 240".
- C. manually at 60".
- D. manually at 270".

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Question 9  
T1/G1 - kds

BW/E05EK1.3 Steam Line Rupture - Excessive Heat Transfer / 4  
**Knowledge of the operational implications of the following concepts as they apply to the (Excessive Heat Transfer):** Annunciators and conditions indicating signals, and remedial actions associated with the (Excessive Heat Transfer).

**K/A MATCH ANALYSIS**

Requires knowledge of Annunciator setpoints, Main Steam Line Break circuitry and actions associated with a Main Steam Line Break.

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect: Per Rule 7 SG FEED CONTROL, with SCM > 0 and any RCP ON, maintain SG level at 30" [60" ACC]. With > 3 psig in the reactor building, ACC levels are to be established. Plausible because if ACC conditions were not met, it would be correct.
- B. Incorrect: Per Rule 7 SG FEED CONTROL, with SCM > 0 and any RCP ON, maintain SG level at 30" [60" ACC]. With > 3 psig in the reactor building, ACC levels are to be established. Plausible because if RCPs were secured and ACC conditions were not met, it would be correct.
- C. Correct: Per Rule 7 SG FEED CONTROL, with SCM > 0 and any RCP ON, maintain SG level at 30" [60" ACC]. With > 3 psig in the reactor building, ACC levels are to be established.**
- D. Incorrect: Per Rule 7 SG FEED CONTROL, with SCM > 0 and any RCP ON, maintain SG level at 30" [60" ACC]. With > 3 psig in the reactor building, ACC levels are to be established. Plausible because if RCPs were secured, it would be correct.

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Technical Reference(s): **EOP Rule 5, Rule 7 Rev 36,**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-LOHT Obj R27**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**Rewrote to remove overlap with #10. >>> GL OK -- Changed cog level to C/A.**

**1 POINT**

**Question 10**

Unit 1 plant conditions:

Time = 0200

- Power = 100%

Time = 0202

- '1A' SG pressure = 100 psig
- '1B' SG pressure = 810 psig
- RB pressure = 3.6 psig
- PZR level = 9 inches decreasing
- RCS pressure = 1610 psig decreasing
- CETCs = 520°F and decreasing.

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

A \_\_\_\_\_ has occurred and \_\_\_\_\_.

**ASSUME NO OPERATOR ACTION**

- A. Small break LOCA / ES Channels 3 and 4 have actuated
- B. Small break LOCA / ES Channels 3 and 4 have NOT actuated
- C. Main FDW line break / AFIS will have actuated to secure the Main FDW pumps
- D. Main FDW line break / AFIS will NOT have actuated to secure the Main FDW pumps

Question 10

**T1/G1 - gcw**

054AK1.01 Loss of Main Feedwater / 4

**Knowledge of the operational implications of the following concepts as they apply to Loss of Main Feedwater (MFW):** MFW line break depressurizes the S/G (similar to a steam line break) (4.1/4.3)

**K/A MATCH ANALYSIS**

Question requires the diagnosis of a MFW line break and the resulting loss of Main FDW pumps.

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect- High containment pressure would be reached over a period of time, depending on break size. Pressurizer level would decrease due to the leak. RCS pressure would also decrease based on the leak. CETC's would not decrease based on a small break LOCA. RCS is not saturated. Second part correct. ES channels 3 and 4 should have actuated on RB pressure > 3 psig.
- B. Incorrect- High containment pressure would be reached over a period of time, depending on break size. Pressurizer level would decrease due to the leak. RCS pressure would also decrease based on the leak. CETC's would not decrease based on a small break LOCA. RCS is not saturated. Second part incorrect. ES channels 3 and 4 should have actuated on RB pressure > 3 psig. Would not have actuated on low RCS pressure.
- C. Correct- Indications are present that indicate an Excessive heat transfer which is resulting in an overcooling event. A FDW line break in the RB would result in a plant response similar to a Main Steam Line break. AFIS will actuate which will secure both Main FDW pumps.**
- D. Incorrect- first part correct. Indications are present that indicate an Excessive heat transfer which is resulting in an overcooling event. A FDW line break in the RB would result in a plant response similar to a Main Steam Line break. AFIS will actuate which will secure both Main FDW pumps.

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Technical Reference(s): **EAP-EHT Rev 14a, CF-FDW Rev 16**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-EHT, R01; CF-FDW, R43**

Question Source: **Bank**

Question History: Last NRC Exam: **2004 ONS RO Exam**

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**Rewrote #9. Modified C and D to ensure only one correct answer. >>> Modified C and D slightly. GL OK**

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**1 POINT**

**Question 11**

Unit 1 plant conditions:

- Blackout tab in progress

Which ONE of the following describes the maximum allowed time (minutes) to establish SSF RCMU flow and the bases for this limit?

- A. 14 / prevents RCP seal failures
- B. 14 / ensures minimum makeup required for cooldown
- C. 20 / prevents RCP seal failures
- D. 20 / ensures minimum makeup required for cooldown

Question 11  
**T1/G1 - gcw**

055EK3.02 Station Blackout / 6

**Knowledge of the reasons for the following responses as they apply to the Station Blackout:** Actions contained in EOP for loss of offsite and onsite power (4.3/4.6)

**K/A MATCH ANALYSIS**

Question requires knowledge of the bases for a step in the EOP during a Blackout.

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect, first part is incorrect. Plausible because this is the time required to establish SSF ASW pump flow. Second part is correct.
- B. Incorrect, first part is incorrect. Plausible because this is the time required to establish SSF ASW pump flow. Second part is incorrect. Plausible because this is the only makeup available until power is restored.
- C. Correct, SSF RCMU flow must be established within 20 minutes of an event that causes a loss of HPI seal injection and CC to the RCPs. This is to prevent RCP seal failures and possible large RCS leakage due to no seal cooling.**
- D. Incorrect, first part is correct. Second part is incorrect. Plausible because this is the only makeup available until power is restored.

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Technical Reference(s): **EOP IMAs Rev 36**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-SSF R29**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**GL OK**

**1 POINT**

**Question 12**

Plant initial conditions:

- Units 1 and 2 Reactor power = 100%
- Units 3 Reactor power = 26%
- Switchyard Isolation occurs
- Unit 1 regains power from CT-1
- CT-2 Lockout has occurred

Current conditions:

- Unit 2 SSF is activated
- Unit 2 SSF RCMU pump operating
- Unit 2's PORV has seat leakage

Based on the above conditions, which ONE of the following describes who in accordance with OMP 2-1 (Duties and Responsibilities of On-Shift Operations Personnel) is designated to activate the SSF and where the PORV block valve can be operated to stop the leakage?

- A. Unit 2's BOP / SSF control room ONLY
- B. Unit 3's BOP / SSF control room ONLY
- C. Unit 2's BOP / SSF AND Plant control room
- D. Unit 3's BOP / SSF AND Plant control room

Question 12

**T1/G1 - gcw**

056AA1.33 Loss of Off-site Power / 6

**Ability to operate and / or monitor the following as they apply to the Loss of Offsite Power: PORV block valve control switch (3.3/3.5)**

**K/A MATCH ANALYSIS**

Question requires knowledge of 2RC-4 (PORV BLOCK) power supply and how it is affected following a Loss of Onsite Power.

**ANSWER CHOICE ANALYSIS**

**Answer: A**

- A. Correct, per OMP 2-1 (Duties and Responsibilities of On-Shift Operations Personnel) the Unit 2 BOP is designated to activate the SSF. After the SSF is activated 2RC-4 will be operated from the SSF.**
- B. Incorrect, first part is incorrect. Plausible because Unit 3 is not affected and the OMP direct the BOP to go the SSF "*unless another qualified SSF operator is available*" For a single Unit event another Units BOP would go to the SSF. Second part is correct.
- C. Incorrect, first part is correct. Second part is incorrect. Plausible because both places have a switch for 2RC-4.
- D. Incorrect, both parts incorrect.

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Technical Reference(s): **ADM-OMP Rev15a, EAP-SSF Rev 21, OMP 2-01 Attachment D (SSF Staffing Requirements)**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **ADM-OMP Obj R5**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**Modified question to improve answer plausibility. GL OK**

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**1 POINT**

**Question 13**

Unit 1 initial conditions:

- Reactor power = 100%

Current conditions:

- 1A SG XSUR Primary = Blank
- 1A SG XSUR Backup = 152" stable
- 1B SG XSUR Primary = 152" stable
- 1B SG XSUR Backup = Blank
- 1A SG outlet Pressure (Dixon) Train A = 895 psig
- 1B SG outlet Pressure (Dixon) Train A = 895 psig
- 1A SG outlet Pressure (Dixon) Train B = Blank
- 1B SG outlet Pressure (Dixon) Train B = Blank

Based on current conditions, which ONE of the following states the power supply that has de-energized?

- A. 1DCA
- B. 1KVIB
- C. 1KVIC
- D. 1DCB

Question 13

T1/G1 - kds

057AA2.05 Loss of Vital AC Inst. Bus / 6

**Ability to determine and interpret the following as they apply to the Loss of Vital AC Instrument Bus: S/G pressure and level meters (3.5/3.8)**

**K/A MATCH ANALYSIS**

Requires knowledge of SG meter power supplies.

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect: A loss of DCA will not cause a loss of KVIB. Plausible because DCA normally supplies Inverter DIB.
- B. Correct: KVIB supplies power to A & B SG train B pressure indication and 1A SG XSUR Primary and 1B SG XSUR Secondary level indications.**
- C. Incorrect: KVIB supplies power to A & B SG train B pressure indication and 1A SG XSUR Primary and 1B SG XSUR Secondary level indications. Plausible because KVIB provides power to the other meters mentioned in the stem.
- D. Incorrect: A loss of DCB will not cause a loss of KVIB. Plausible because DCB normally supplies Inverter DIC.

---

Technical Reference(s): **CF-EF Rev 24**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **CF-EF Obj R30/35**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**Explain. Added unit designators. >>>> GL OK**

**1 POINT**

**Question 14**

Unit 1 initial conditions:

- Reactor power = 100%
- 1SA6/B2 INVERTER 1DID SYSTEM TROUBLE actuated

Current conditions:

- NEO reports:
  - 1SA13/A8 INVERTER 1DID INPUT VOLTAGE LOW actuated
  - Inverter 1DID output voltage low

Based on the above conditions, which ONE of the following describes the alarm setpoint (volts DC) and what action does 1SA13/A8 ARG direct if the inverter output voltage remains low?

- A. 110 / Transfer DC bus 1DID power to alternate unit (Unit 2 DCB)
- B. 110 / Transfer power for 1KVID to Regulated Power Panel Board (1KRA)
- C. 121 / Transfer DC bus 1DID power to alternate unit (Unit 2 DCB)
- D. 121 / Transfer power for 1KVID to Regulated Power Panel Board (1KRA)

Question 14

**T1/G1 -kds**

058G2.4.50 Loss of DC Power / 6

**Ability to verify system alarm setpoints and operate controls identified in the alarm response manual. (4.2/4.0)**

**K/A MATCH ANALYSIS**

Requires knowledge of DC power stat alarms and actions directed by alarm response guide.

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect: 1SA6/B2 directs the operator to 1SA13/A8 (INVERTER 1DID INPUT VOLTAGE LOW) which directs the operator to manually transfer vital loads on 1KVID to 1KRA. Plausible because Unit 2 DCB will automatically supply power to Unit 1 DC bus DID (which powers the DID inverter)
- B. Correct: Inverter low DC input setpoint for 1DID is < 110 VDC. 1SA6/B2 directs the operator to 1SA13/A8 (INVERTER 1DID INPUT VOLTAGE LOW) which directs the operator to manually transfer vital loads on 1KVID to 1KRA.**
- C. Incorrect: Setpoint is 110 VDC. Plausible because the setpoint for DC Bus volts low is 121 VDC. Second part is plausible because Unit 2 DCB will automatically supply power to Unit 1 DC bus DID (which powers the DID inverter)
- D. Incorrect: Setpoint is 110 VDC. Plausible because the setpoint for DC Bus volts low is 121 VDC. Second part is correct.

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Technical Reference(s): **EL-VPC Rev 13b**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EL-VPC Obj R2**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**Incorporated suggestion. GL OK**

**1 POINT**

**Question 15**

Unit 1 initial conditions:

- Reactor power = 100%

Current conditions:

- A, B and C LPSW pumps tripped
- AP/24, Loss of LPSW in progress
- RCP temperatures increasing

Based on the above conditions, which ONE of the following statements is a required action per AP/24?

- A. If a RCP radial bearing temperature exceeds 225 °F, manually trip the Reactor and stop ONLY that RCP
- B. If a RCP radial bearing temperature exceeds 225 °F, manually trip the Reactor and stop ALL RCPs
- C. If a RCP motor stator temperature exceeds 260 °F, manually trip the Reactor and stop ONLY that RCP
- D. If a RCP motor stator temperature exceeds 260 °F, manually trip the Reactor and stop ALL RCPs

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Question 15

**T1/G1 - gcw**

062AA1.02 Loss of Nuclear Svc Water / 4

**Ability to operate and / or monitor the following as they apply to the Loss of Nuclear Service Water (SWS):** Loads on the SWS in the control room

**K/A MATCH ANALYSIS**

Question requires knowledge of actions required for LPSW loads during a Loss of LPSW (Nuclear Service Water)

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect: the correct limit is given for RCP Radial Bearing Temp however the procedure directs tripping ALL RCP not just the affected RCP. This is plausible because the direction given is consistent with the direction provided in AP/16 (Abnormal RCP Operation) Encl 5.1 for High Radial Bearing Temperature.
- B. Correct, per AP/24, if any RCP Radial Bearing Temp is > 225 °F, the operator is directed to trip the Reactor and stop ALL RCPs.**
- C. Incorrect, the limit value provided is incorrect. The value provided is plausible as it is the limit value provided for Seal Return Temperature. The procedure directs tripping ALL RCP not just the affected RCP. This is plausible because the direction given is consistent with the direction provided in AP/16 (Abnormal RCP Operation) Encl 5.1 for High Motor Stator Temperature.
- D. Incorrect, Incorrect, the limit value provided is incorrect. The value provided is plausible as it is the limit value provided for Seal Return Temperature. The action provided is correct.

---

Technical Reference(s): **AP/24 (Loss of LPSW) Rev 22**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-APG R9**

Question Source: **Modified, EAP210966**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**GL OK**

**1 POINT**

**Question 16**

Unit 2 initial conditions:

AP/2/A/1700/022, Loss of Instrument Air in progress

Current conditions:

- Instrument Air Pressure = 92 psig decreasing slowly
- An operator has been dispatched to "Place all Backup IA Compressor control switches in BASE"

Which ONE of the following describes how this step should be performed and why?

When transferring from STBY to BASE the switch should...

- A. remain in OFF for at least 3 seconds to prevent activating the anti-pump circuit.
- B. remain in OFF for at least 3 seconds to prevent tripping the breaker.
- C. be turned as quickly as possible to prevent tripping the breaker.
- D. be turned as quickly as possible to prevent activating the anti-pump circuit.

Question 16

**T1/G1 - gcw**

065AK3.08 Loss of Instrument Air / 8

**Knowledge of the reasons for the following responses as they apply to the Loss of Instrument Air: Actions contained in EOP for loss of instrument air (3.7/3.9)**

**K/A MATCH ANALYSIS**

ONS has no actions in the EOP for Loss IA. This question requires knowledge of reasons for actions contained in AP/22 (Loss of Instrument Air).

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect, first part is correct. Second part is incorrect. Plausible because the anti-pump circuit allows only one close operation per applied close signal.
- B. Correct, a note in AP/22 states; "*When transferring from STD-BY 1 to BASE, the Backup IA Compressor switch should remain in OFF for at least 3 seconds to avoid tripping the breaker.*"**
- C. Incorrect, first part is incorrect. Plausible is you assumed the breakers was closed and did not want to remove the close signal. Second part is correct.
- D. Incorrect, both parts are incorrect. Plausible is you assumed the breakers was closed and operating the switch quickly would prevent applying a close signal to a breaker that already has a close signal present (anti-pump).

---

Technical Reference(s): **AP/22 (Loss of Instrument Air) Rev 33**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **SSS-IA R53**

Question Source: **NEW**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**Incorporated suggestion. GL OK**

**1 POINT**

**Question 17**

Unit 1 initial conditions:

- Reactor power = 100%
- TD EFDWP OOS

Current conditions:

- Reactor power = 40% decreasing
- "1A" Main Steam Line Pressure = 950 psig and slowly decreasing
- "1B" Main Steam Line Pressure = 105 psig and decreasing
- BOTH Main FDW pumps tripped
- BOTH MDEFDW pumps tripped
- RCS Temperature = 505°F and decreasing
- SCM = 7°F decreasing slowly
- OATC is performing Immediate Manual Actions (IMAs)
- BOP is performing a Symptoms Check

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

The OATC will \_\_\_\_\_ and the BOP operator will perform \_\_\_\_\_.

- A. complete IMAs / Rule 1 (ATWS/Unanticipated Nuclear Power Production)
- B. perform Rule 1 (ATWS/Unanticipated Nuclear Power Production) / Rule 2 (Loss of SCM)
- C. perform Rule 1 (ATWS/Unanticipated Nuclear Power Production) / Rule 3 (Loss of Main or Emergency FDW)
- D. complete IMAs / Rule 5 (Main Steam Line Break)

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Question 17

**T1/G1 - gcw**

BW/E04EA2.1 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4  
**Ability to determine and interpret the following as they apply to the (Inadequate Heat Transfer):** Facility conditions and selection of appropriate procedures during abnormal and emergency operations. (3.2/4.4)

**K/A MATCH ANALYSIS**

Question requires the knowledge to determine which procedure should be performed during a plant event which includes a loss of heat transfer.

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect, completing IMAs would be correct if the reactor was shut down. Although Rule 1 has the highest priority at this time, it will be performed by the OATC.
- B. Incorrect, The first part is correct. This would be correct if SCM was 0°F.
- C. **Correct, during performance of IMAs the OATC should determine that the reactor has not tripped. He should then perform Rule 1 (ATWS/Unanticipated Nuclear Power Production). The BOP should determine that loss of Main and Emergency FDW has occurred and Rule 3 should be performed.**
- D. Incorrect, Completing IMAs would be correct if the reactor was shut down. Rule 5 (Main Steam Line Break) would be correct if a loss of Main and Emergency FDW had not occurred.

---

Technical Reference(s): **OMP 1-18 Rev 25, EAP-EOP Rev 13a**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-EOP R20, R27**

Question Source: **Modified Bank Oconee RO 2004 # 16**

Question History: Last NRC Exam: **Oconee RO 2004**

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**GL OK - Changed to 10°F SCM and decreasing slowly. This is to ensure "B" is not correct. \* Changed to 7 degrees SCM. GL OK**

**1 POINT**

**Question 18**

Unit 1 initial conditions:

- Reactor power = 35% stable
- AP/34 (Degraded Grid) in progress

Current conditions:

- Generator voltage cannot be maintained within the capability curve

Based on current conditions, which ONE of the following describes a required action in accordance with AP/34?

- A. Open PCB 20 and 21
- B. Manually trip ALL operating Keowee Units
- C. Initiate AP/29 (Rapid Unit Shutdown)
- D. Manually trip the Turbine

Question 18

**T1/G1 - gcw**

077G2.4.31 Generator Voltage and Electric Grid Disturbances / 6

**Knowledge of annunciator alarms, indications, or response procedures. (4.2/4.1)**

**K/A MATCH ANALYSIS**

Question requires knowledge of AP/34 (Degraded Grid).

**ANSWER CHOICE ANALYSIS**

**Answer: A**

- A. Correct, because reactor power is < 50% PCB 20 and 21 are opened and AP/1 (Load Rejection) is entered.**
- B. Incorrect, plausible because this action is directed but is conditional based on Keowee Voltage being less than 13.3 kv.
- C. Incorrect, plausible because normally AP/29 would be used to quickly reduce power and take the turbine off line.
- D. Incorrect, plausible because the Generator is operating outside of it's limits.

---

Technical Reference(s): **AP/34 (Degraded Grid) Rev 06**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-APG R9**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

***Incorporated suggestion. GL OK***

**1 POINT**

**Question 19**

Unit 1 plant conditions:

- Reactor power = 50%
- Power escalation in progress
- Control rods failed to stop moving out when the CTPD Set was reached
- The OATC took ICS to manual
- Rod motion has stopped
- Tave = 582°F increasing

Based on the above conditions, which ONE of the following is required in accordance with plant transient response process contained in SOMP 1-02 (Reactivity Management)?

- A. Increase FDW to restore Tave to setpoint
- B. Increase FDW to restore heat balance and stop the RCS pressure transient
- C. Insert rods to restore Tave to setpoint
- D. Insert rods to restore heat balance and stop the RCS pressure transient

Question 19

**T1/G2**

001AK3.01 Continuous Rod Withdrawal / 1

**Knowledge of the reasons for the following responses as they apply to the Continuous Rod Withdrawal:** Manually driving rods into position that existed before start of casualty (3.2/3.6)

**K/A MATCH ANALYSIS**

Facility has no abnormal procedure for this event. The DUKE Energy Reactivity Management Oconee Attachment is used to address this K/A. Operator response and the reason are addressed.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect. This action is contrary to SOMP 1-02 Guidance. Plausible as it would lower Tave.
- B. Incorrect. This action is contrary to SOMP 1-02 Guidance. Plausible as it would stop the RCS pressure transient caused by the rise in Tave
- C. Incorrect. Operator response is based on RCS Pressure and FW Demand. Tave is not the primary control parameter per SOMP 1-02. Plausible as inserting rods will lower Tave.
- D. Correct. This aligns with SOMP 1-02 Guidance.**

---

Technical Reference(s): **SOMP-1-02 Rev 04, Reactivity Management, Attachment 9.1, 4.E**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **ADM-OMP (R23)**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

***Incorporated suggestion. GL OK***

**1 POINT**

**Question 20**

Unit 1 initial conditions:

- Reactor power = 100%
- Turbine trips

Current conditions:

- Reactor power = 14% decreasing
- ALL HPI Pumps operating
- 1A HPI header flow = 675gpm
- 1B HPI header flow = 375gpm
- HPI seal injection flow = 38gpm
- 1HP-24 OPEN
- 1HP-25 indicating lights not LIT
- 1HP-26 and 27 OPEN

Based on the above conditions, which ONE of the following describes the actions (if any) required to place the HPI system in the proper configuration?

- A. No actions are required
- B. Stop 1A or 1B HPI pump
- C. Throttle 1HP-26 to reduce 1A HPI header flow < 475gpm
- D. Ensure total HPI injection flow including RCP Seal Injection is < 950 gpm

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Question 20  
T1/G2 - gcw

024G2.1.31 Emergency Boration / 1

**Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup. (4.6/4.3)**

**K/A MATCH ANALYSIS**

Question requires knowledge of control indications and Rule 1 (ATWS/Unanticipated Unclear Power Production)

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect, Plausible as running all available HPI pumps maximizes injection flow of Borated water and is consistent with the guidance provided when maximum injection is desired (Rule 2).
- B. Correct, Rule 1 directs the Operator to ensure only 1A or 1B HPI pump is operating.**
- C. Incorrect, Plausible as the guidance and flow limit are consistent with the guidance for only 1 HPI pump operating in the "A" header in Rule 6.
- D. Incorrect, this is correct for Rule 6 if A and B HPI pump are operating with 1HP-409 open.

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Technical Reference(s): **EOP RULE 1 Rev 36**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-UNPP R10**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**GL OK**

**1 POINT**

**Question 21**

Unit 1 initial conditions:

- Reactor power = 100%

Current conditions:

- Condenser vacuum = 5.6 inches Hg stable

Based on the above conditions, which ONE of the following describes the expected SGs pressure (psig) and on what **PAM** instrument can it be monitored?

**ASSUME NO OPERATOR ACTIONS**

- A. Less than 1020 / 1A and 1B MS PRESS
- B. Less than 1020 / 1A and 1B SG OUT PRESS
- C. Greater than 1020 / 1A and 1B MS PRESS
- D. Greater than 1020 / 1A and 1B SG OUT PRESS

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Question 21  
**T1/G2 - gcw**

051G2.4.3 Loss of Condenser Vacuum / 4

**Ability to identify post-accident instrumentation. (3.7/3.9)**

**K/A MATCH ANALYSIS**

Question requires knowledge of plant response to a loss of condenser vacuum and what PAM instruments are available to monitor MS pressure.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect, first part is incorrect. Plausible because it would be true in Vacuum was greater than 7 inches Hg. Second part is incorrect but plausible because on Unit 1 the MS pressure gage is new and part of the "strings Mod".
- B. Incorrect, first part is incorrect. Plausible because it would be true in Vacuum was greater than 7 inches Hg. Second part is correct.
- C. Incorrect, first part is correct. Second part is incorrect but plausible because on Unit 1 the MS pressure gage is new and part of the "strings Mod".
- D. Correct, Main Turbine and Main FDW pumps trip which results in Rx trip. Turbine Bypass valves fail closed due to Condenser Vacuum less than 7" Hg. Therefore MS Pressure will rise to the lowest MSRVS setpoint (1050 psig) (No operator action taken to establish AVV control) 1A and 1B SG OUT PRESS are the PAM instruments.**

---

Technical Reference(s): **AP/27 Rev 04, STG-ICS Chap 3 Rev 9, STG-MS Rev 9a, STG-SG Rev**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **STG-ICS R10**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**Updated distractor analysis. GL OK**

**1 POINT**

**Question 22**

Unit 1 plant conditions:

- Unit shutdown in progress
- Reactor power = 80% decreasing
- SGTL 1A SG = 20 gpm

Based on the above conditions, which ONE of the following describes the most significant radiation hazard in the vicinity of the Main Steam lines and actions taken to limit the spread of contamination to other units?

A. 6.7 Mev  $\gamma$ 's from the decay of N16

All 3 units Auxiliary Steam Systems are aligned such that each unit is supplying its own Auxiliary Steam Loads.

B. 6.7 Mev  $\gamma$ 's from the decay of N16

The Turbine Building Sump Trenches are split to prevent secondary system leaks from the affected Unit from going to the other units.

C. 2.2 Mev  $\gamma$ 's from the decay of Co60 due to the primary to secondary leakage

All 3 units Auxiliary Steam Systems are aligned such that each unit is supplying its own Auxiliary Steam Loads.

D. 2.2 Mev  $\gamma$ 's from the decay of Co60 due to the primary to secondary leakage

The Turbine Building Sump Trenches are split to prevent secondary system leaks from the affected Unit from going to the other units.

Question 22

T1/G2 - kds

059AK1.01 Accidental Liquid RadWaste Release / 9

**Knowledge of the operational implications of the following concepts as they apply to Accidental Liquid Radwaste Release:** Types of radiation, their units of intensity and the location of the sources of radiation in a nuclear power plant (2.7/3.1)

**K/A MATCH ANALYSIS**

Knowledge of the first part of the answer requires an understanding of gamma radiation energy level and the source of the gamma. Knowledge of the second part indicates an understanding of the affect of the leak on the secondary systems and the actions take to control.

**ANSWER CHOICE ANALYSIS****Answer: B**

- A. Incorrect. Gamma source is correct however action taken is not. Plausible because splitting the Aux Steam Header would minimize contamination of other units however action directed for Aux Steam places the affected unit Aux Steam header on and unaffected Unit vice splitting all three units.
- B. Correct. N-16 Gamma are the hazard of concern as the source of the gamma's can be present in the steam from the SG. AP/31 directs the TB Sumps be split to prevent cross unit contamination from secondary system leakage.**
- C. Incorrect. Gamma source is not correct. Plausible as Co60 will be present in the leakage to the SG however most of the CO will remain in the SG vice being carried to the steam. 2<sup>nd</sup> part is plausible because splitting the Aux Steam Header would minimize contamination of other units however action directed for Aux Steam places the affected unit Aux Steam header on and unaffected Unit vice splitting all three units.
- D. Incorrect. Gamma source is not correct. Plausible as Co60 will be present in the leakage to the SG however most of the CO will remain in the SG vice being carried to the steam. 2<sup>nd</sup> part is correct.

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Technical Reference(s): **AP/31 (Primary to Secondary Leakage) Rev 14, RAD-RIA Rev 05c**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **RAD-RIA 15 and 16, EAP-APG R9**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**Incorporated suggestion. GL OK -- Modified A and C for clarity. GL OK**

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**1 POINT**

**Question 23**

Unit 1 plant conditions:

- Reactor power = 100%
- 1SA-08/A9 RM AREA MONITOR RADIATION HIGH, has actuated
- 1RIA-39 (CNTL RM GAS) is in alarm HIGH

Based on the conditions above, which ONE of the following describes the actions directed to be performed and the reason for the actions?

- A. Start BOTH Outside Air Booster Fans and open Control Room doors to provide dilution to the air in the Control Room and reduce airborne radiation levels
- B. Start BOTH Outside Air Booster Fans and the dampers align to ensure Control Room pressure is positive in relation to outside atmosphere
- C. Start ONE Outside Air Booster Fan and open Control Room doors to provide dilution to the air in the Control Room and reduce airborne radiation levels
- D. Start ONE Outside Air Booster Fan and the dampers align to ensure Control Room pressure is positive in relation to outside atmosphere

Question 23

**T1/G2 - jmb**

061AK3.02 ARM System Alarms / 7

**Knowledge of the reasons for the following responses as they apply to the Area Radiation Monitoring (ARM) System Alarms:** Guidance contained in alarm response for ARM system (3.4/3.6)

**K/A MATCH ANALYSIS**

Requires knowledge of Alarm Response action to enter AP/18 and guidance contained related to Hi Rad Alarm in Control Room. (RIA Alarm Response 1SA-08/ A9 directs entry into AP/18)

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect. Action to start BOTH Booster Fans is directed by AP/18, Action to open doors is plausible as it is consistent with direction provided in AP/36 for Degraded Control Room Area Cooling
- B. Correct. Action directed in AP-18 is to start BOTH Booster Fans and ensure Dampers are position properly to establish a positive pressure in the control room.**
- C. Incorrect. Action is to start BOTH Booster Fans is directed by AP/18 starting ONE fan while not procedurally directed is reasonable as it will provide a pressure source to prevent additional intake to the control room. Action to open doors is plausible as it is consistent with direction provided in AP/36 for Degraded Control Room Area Cooling.
- D. Incorrect. Action is to start BOTH Booster Fans is directed by AP/18 starting ONE fan while not procedurally directed is reasonable as it will provide a pressure source to prevent additional intake to the control room. Second part is correct

---

Technical Reference(s): **ARG 1SA-8 A-9 Rev 19, AP/18 Rev 15**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **RAD-RIA (R16), EAP-APG (R9)**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**Added "airborne" to "A" and "C". GL OK**

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**1 POINT**

**Question 24**

Plant conditions:

- A dropped rod caused a runback from 100 to 55% power
- The operating crew has notified Chemistry that power changed greater than 15% in one hour

Which one of the following identifies the analysis to be run by Chemistry and the reason for it?

- A. E Bar to re-calculate the RCS gross activity limit
- B. Dose Equivalent Iodine to monitor for fuel failures and TS compliance
- C. RCS Boron concentration to verify proper shutdown margin
- D. Gamma Isotopic Analysis to determine if a crud burst requires RCS cleanup actions

Question 24

**T1/G2**

BW/A01AK3.1 Plant Runback / 1

**Knowledge of the reasons for the following responses as they apply to the (Plant Runback):** Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics. (3.2/3.4)

**K/A MATCH ANALYSIS**

Per TS Basis, Iodine spikes and/or fuel failure is more likely following a rapid transient. The question identifies the sample to be drawn and the reason for it.

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect. This is a scheduled surveillance but not required by power changes.
- B. Correct. This is the specific sample required by the notification and the reason.**
- C. Incorrect. Shutdown margin will be verified using rod position.
- D. Incorrect. This is a routine sample and one of the purposes is to monitor for crud bursts but it is not required for power changes.

---

Technical Reference(s): **AP/15 Rev 10, Encl 5.2**  
**TS 3.4.11/TS Basis 3.4.11.2 (Amendment 300)**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EOP-APG (R9)**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**OPS OK >>> GL OK**

**1 POINT**

**Question 25**

Unit 1 initial plant conditions:

- Reactor power = 25%
- 1FDW-41 (1B Main FDW Control) in MANUAL

Current conditions:

- ICS HAND power lost

Based on the above conditions, which ONE of the following describes the affect on SG feed flow assuming no operator action and what would happen if the AUTO pushbutton is depressed on the 1FDW-41 Hand/Auto Station?

- A. 1B SG overfeed will occur and 1FDW-41 will transfer to AUTO.
- B. 1B SG overfeed will occur and 1FDW-41 will remain in MANUAL.
- C. 1B SG underfeed will occur and 1FDW-41 will transfer to AUTO.
- D. 1B SG underfeed will occur and 1FDW-41 will remain in MANUAL.

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Question 25  
**T1/G2 - gcw**

BW/A02AK2.2 Loss of NNI-X/Y / 7

**Knowledge of the interrelations between the (Loss of NNI-Y) and the following:** Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility. (3.8/3.8)

**K/A MATCH ANALYSIS**

This question requires knowledge of the plant response and the affect on 1FDW-41 to a loss of Hand Power (KU).

**ANSWER CHOICE ANALYSIS**

**Answer: A**

- A. Correct, with a loss of ICS Hand any ICS station in manual will fail to the 50% position. At 25% power a SG overfeed will occur. 1FDW-41 can be placed in AUTO.**
- B. Incorrect, first part is correct. The second part is incorrect. Plausible because some power to the controller was lost.
- C. Incorrect, first part is in correct. Plausible because a 100% power an underfeed would occur. The second part is correct.
- D. Incorrect, first part is in correct. Plausible because a 100% power an underfeed would occur. The second part is incorrect.

---

Technical Reference(s): **AP/23 (Loss of ICS Power) Rev 17, STG-ICS Chap 8 Rev 7c**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **STG-ICS R33**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**Modified stem slightly for clarification. GL OK --- Changed "A" to 1B in each answer. GL OK**

**1 POINT**

**Question 26**

Unit 1 initial conditions:

- Reactor power = 100%
- HWP Pump Load Shed Defeat Switch selected to 1B
- Both Channels of CRD trip confirm circuitry inoperable

Current conditions:

- Turbine trips
- ES Channels 1 and 2 actuates

Based on the above conditions, which ONE of the following describes which HWP(s) will be operating and the purpose of the LOCA Load Shed Logic circuit?

**ASSUME NO OPERATOR ACTIONS**

- A. ONLY the 1B HWP will be operating  
LOCA Load Shed prevents overloading CT-4 or CT-5
- B. ALL three HWPs will be operating  
LOCA Load Shed prevents overloading CT-4 or CT-5
- C. ONLY the 1B HWP will be operating  
LOCA Load Shed reduces the post LOCA voltage dip on ES buses
- D. ALL three HWPs will be operating  
LOCA Load Shed reduces the post LOCA voltage dip on ES buses



**1 POINT**

**Question 27**

Unit plant conditions:

- LOCA CD tab in progress
- ALL SCMs = 4°F increasing
- RCS pressure is controllable
- Statalarm 1SA7/E2 (LP Injection ES Bypass Permit) actuated

Which ONE of the following describes when Statalarm 1SA7/E2 actuates and the required action in accordance with the LOCA CD tab?

- A. RCS Pressure = 900 psig  
Bypass ES Channels 1 and 2
- B. RCS Pressure = 900 psig  
Bypass ES Channels 3 and 4
- C. RCS Pressure = 1750 psig  
Bypass ES Channels 1 and 2
- D. RCS Pressure = 1750 psig  
Bypass ES Channels 3 and 4

Question 27

**T1/G2**

BW/E08EK1.3 LOCA Cooldown - Depress. / 4

**Knowledge of the operational implications of the following concepts as they apply to the (LOCA Cooldown):** Annunciators and conditions indicating signals, and remedial actions associated with the (LOCA Cooldown). (3.3/3.5)

**K/A MATCH ANALYSIS**

Requires knowledge of Annunciator actions taken during a LOCA cooldown.

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect, both parts are incorrect.
- B. Correct, LP Injection ES Bypass Permit setpoint is 900 psig. At this time ES channels 3 and 4 will be bypassed.**
- C. Incorrect: first part is incorrect. Plausible because this the HPI ES bypass setpoint. Second part is incorrect. Plausible because this would be correct for HPI ES bypass.
- D. Incorrect, first part is incorrect. Plausible because this the HPI ES bypass setpoint.

---

Technical Reference(s): **1SA7/E2 (LP Injection ES Bypass Permit), EOP LCD Tab Rev 36**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-LCD**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**Removed BWST level. GL OK -- Added " RB level" to stem and "ONLY" to answers. To ensure only one correct answer. ---- Replaced question to eliminate double jeopardy with question 40. – GL OK**

**1 POINT**

**Question 28**

Unit 1 plant conditions:

- Unit Startup is in progress
- RCS Pressure = 800 psig
- 1A1 and 1A2 RCPs are operating

Based on the above conditions, which ONE of the following would prevent 1B2 RCP from starting?

- A. RCS temperature = 300°F
- B. Oil lift pressure = 660 psig
- C. HPI Seal Injection flow rate = 24 gpm
- D. Total Component Cooling flow = 550 gpm

Question 28  
**T2/G1 - gcw**

003K6.14 Reactor Coolant Pump

**Knowledge of the effect of a loss or malfunction on the following will have on the RCPS: Starting requirements (2.6/2.9)**

**K/A MATCH ANALYSIS**

Question requires knowledge of RCP starting interlocks.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect, RC temperature is not a concern unless the 4th RCP is being started. This is the 3rd RCP start.
- B. Incorrect, the oil lift pressure interlock is satisfied if lift pressure is > 600 psig
- C. Incorrect, RCP Seal Injection interlock for Unit 1 is > 22 gpm (Unit 2/3 is 30 gpm). This would be correct for Unit 2 or 3.
- D. Correct, CC flow interlock is  $\geq$  575 gpm**

---

Technical Reference(s): **OSS-0254.00-00-1033 Rev. 25**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **PNS-CPM (R14)**

Question Source: **Bank PNS061401**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**GL OK**

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**1 POINT**

**Question 29**

Unit 1 plant conditions:

- BWST Temperature = 85°F
- LDST Temperature = 105°F
- RCS pressure = 685 psig

Based on the above conditions, which ONE of the following describes acceptable suction source(s) for Auxiliary Pressurizer Spray and the reason for the applicable limit in accordance with SLC 16.5.8 (Pressurizer)?

- A. LDST ONLY / to reduce thermal stress on the Pzr spray nozzle
- B. LDST or the BWST / to reduce thermal stress on the Pzr spray nozzle
- C. LDST ONLY / to reduce potential for exceeding Pzr heater capacity
- D. LDST or the BWST / to reduce potential for exceeding Pzr heater capacity

Question 29  
T2/G1 - jmb

004A1.03 Chemical and Volume Control

**Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CVCS controls including: RCS pressure (3.8/3.8)**

**K/A MATCH ANALYSIS**

Requires knowledge of limitation on use of Aux Spray for RCS pressure control.

**ANSWER CHOICE ANALYSIS**

**Answer: A**

- A. **Correct, Aux Spray nozzle  $\Delta T$  limit is 410°F. RCS pressure  $685 + 15 = 700$  psia = 503°F Pzr Temp. BWST  $\Delta T$  is  $503 - 85 = 418^\circ\text{F}$ . LDST  $\Delta T = 503 - 105 = 395^\circ\text{F}$ . BWST is above  $\Delta T$  limit therefore only LDST can be used. To reduce thermal stress on the Pzr spray nozzle is the reason.**
- B. Incorrect, BWST is above  $\Delta T$  limit therefore only LDST can be used. Second part is correct.
- C. Incorrect, first part is correct. Second part is plausible because lower temp water would required more heat input.
- D. Incorrect, both parts are incorrect.

---

Technical Reference(s): **EAP-SGTR; SLC 16.5.8 (Pressurizer)**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-SGTR (R24)**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

Replace question. Aux spray to control RCS SCM.

Replaced Question as noted ----- Reordered bullets and added "Pzr Saturated" bullet to improve question clarity. -- Rewrote to eliminate SCM calculation as it is not required to meet the KA and reduce the time required to answer the question.

\* Rewrite second part of C and D. GL OK

**1 POINT**

**Question 30**

Unit 1 plant conditions:

- RCS pressure = 290 psig
- RCS temperature = 240°F
- 1A1 and 1A2 RCP operating
- 1LP-11 (1A LPI COOLER INLET) failed closed

Which ONE of the following describes the LPI mode that will be used for unit cooldown based on the failure of 1LP-11 and what actions, if any, are required to continue the cooldown per OP/1/A/1102/010 (Controlling Procedure For Unit Shutdown)?

- A. Series Mode / no additional action is required
- B. Series Mode / 1/0 RCP operation must be established
- C. Switchover Mode / no additional action is required
- D. Switchover Mode / 1/0 RCP operation must be established

Question 30  
**T2/G1 - gcw**

005A2.04 Residual Heat Removal

**Ability to (a) predict the impacts of the following malfunctions or operations on the RHRS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: RHR valve malfunction (2.9/2.9)**

**K/A MATCH ANALYSIS**

This question requires knowledge of the various modes of LPI operation during cooldown and a failure of a valve would affect which mode to use.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect, first part is incorrect. Plausible because this is the preferred mode for cooldown. Second part is incorrect. Plausible because 2/0 RCP operation is allowed during Series Mode.
- B. Incorrect, first part is incorrect. Second part is correct.
- C. Incorrect, first part is correct. LPI Series Mode is the preferred method for plant cooldown. The Series and High Pressure Mode required the use of the "A" LPI Cooler. Switchover would then be the preferred Mode. Second part is incorrect. Switchover Mode cannot be used with 2/0 RCP operation. 1/0 RCP operation would have to be established.
- D. Correct, LPI Series Mode is the preferred method for plant cooldown. The Series and High Pressure Mode required the use of the "A" LPI Cooler. Switchover would then be the preferred Mode. Switchover Mode cannot be used with 2/0 RCP operation. 1/0 RCP operation would have to be established.**

---

Technical Reference(s): **OP/1/A/1104/004 Rev 116 (Low Pressure Injection),  
OP/1/A/1102/010 Rev 183 (Controlling Procedure For  
Unit Shutdown)**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **PNS-LPI R13, 45**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge  
Comprehension or Analysis**

**GL OK**

**1 POINT**

**Question 31**

Unit 1 plant conditions:

- Mode 5 with RCS temperature at 170 °F with LPI maintaining temperature
- The operating crew is preparing to makeup to the RCS
- No RCPs are operating
- RCS Boron Concentration = 1500 PPM
- COLR Boron Concentration limits are:
  - Refueling – 2200 PPM
  - 1%  $\Delta K/K$  @ 70 °F – 1400 PPM
  - 1%  $\Delta K/K$  @ 200 °F – 1225 PPM

Based on the above conditions, which ONE of the following is the minimum boron concentration (PPM) allowed for the makeup source?

- A. 2201
- B. 1501
- C. 1401
- D. 1226

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Question 31

**T2/G1**

005K5.03 Residual Heat Removal System

**Knowledge of the operational implications of the following concepts as they apply the RHRS: Reactivity effects of RHR fill water (2.9\*/3.1\*)**

**K/A MATCH ANALYSIS**

Question requires knowledge of the minimum boron concentration for makeup while the unit is on LPI cooling; implying knowledge of the reactivity effects. There is no reference document providing information on the observable effect of filling from an incorrect source.

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect. Plausible because it is listed in the procedure but for Mode 6.
- B. Incorrect. Plausible if applicant believes that any concentration < RCS is unacceptable.
- C. Correct. Procedure requires 1%  $\Delta K/K$  @ 70°F concentration.**
- D. Incorrect. Plausible because it is the maximum temperature for Mode 5.

---

Technical Reference(s): **OP/1/A/1104/004 Rev 116 (Low Pressure Injection) Limit and Precaution 2.2.2 (Pg. 2)**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **PNS-LPI (R20)**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

***Modified answers to ensure only one correct answer. Verify how LPI boron is OK prior to placing in service.***

GL OK

**1 POINT**

**Question 32**

Unit 1 initial conditions:

- LBLOCA
- Enclosure 5.1 (ES Actuation) in progress
- RCS pressure = 50 psig decreasing
- 1A and 1B LPIPs operating

Current conditions:

- 1A LPIP trips

Based on the above conditions, which ONE of the following describes actions to be taken in accordance with Enclosure 5.1 AND the results of that action?

- A. Close 1LP-17, LPI Flow will be aligned to ONLY the B Injection Nozzle
- B. Close 1LP-12, LPI Flow will be aligned to ONLY the B Injection Nozzle
- C. Close 1LP-17, LPI Flow will be aligned to BOTH Injection Nozzles
- D. Close 1LP-12, LPI Flow will be aligned to BOTH Injection Nozzles

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Question 32

**T2/G1**

006A4.01 Emergency Core Cooling

**Ability to manually operate and/or monitor in the control room: Pumps (4.1/3.9)**

**K/A MATCH ANALYSIS**

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect: Correct valve manipulation however normal valve lineup in the discharge headers will align flow to both injection nozzles. Plausible as this configuration previously required additional manual operator action to accomplish.
- B. Incorrect: Incorrect valve is manipulated. The valve is plausible as it is the A LPIP discharge valve and is directly upstream of the correct valve. The flowpath distracter is as described in distracter A
- C. Correct: Per Enclosure 5.1 (ES Actuation), if one LPI pump trips while operating, the injection valve for that header (LP 17) is closed and the procedure is continued. Plant configuration changes provided for the flowpath to both injection nozzles through normally open isolation valves and restricting orifices.**
- D. Incorrect: Valve manipulated is as described in distracter B. Flowpath description is correct.

---

Technical Reference(s): **EOP, Enclosure 5.1 (ES Actuation) Rev 36**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-ESA Obj R17**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**GL OK**

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**1 POINT**

**Question 33**

Unit 1 plant conditions:

Time = 0400

- Reactor Power =100%

Time = 0405

- RCS pressure =1500 psig decreasing
- RB pressure = 9 psig

Time =0415

- RCS pressure =1100 psig decreasing
- RB pressure = 11 psig
- Enclosure 5.1 (ES Actuation) actions completed awaiting SRO direction to exit

Time = 0500

- RCS pressure =180 psig decreasing
- RB pressure = 7 psig

Based on the above conditions, which ONE of the following actions is directed to be taken immediately in accordance with Enclosure 5.1?

- A. Close 1CF-1 and 1CF-2
- B. Start ALL LPI Pumps
- C. Secure BOTH RBS Pumps
- D. Start ONLY A & B LPI Pumps



1 POINT

Question 34

Unit 1 was operating at 100% power when the following trends were observed:

- RCS pressure began to lower
- Quench tank level began to rise
- Quench tank pressure began to rise

Which ONE of the following correctly describes the **INITIAL** effect on containment when these trends are observed?

- A. Containment pressure rises. 1RIA-47 indicates an increase in radiation level
- B. Containment pressure rises. 1RIA-47 indicated radiation level remains constant.
- C. Containment pressure remains constant. 1RIA-47 indicates an increase in radiation level
- D. Containment pressure remains constant. 1RIA-47 indicated radiation level remains constant

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Question 34  
T2/G1 - gcw

007K1.01 Pressurizer Relief/Quench Tank

**Knowledge of the physical connections and/or cause effect relationships between the PRTS and the following systems: Containment system (2.9/3.1)**

**K/A MATCH ANALYSIS**

Indications of a vapor space LOCA are present, which means that discharge from PORV will be contained in PRT, thus having no effect on containment parameters until the rupture disk blows.

Plausibility based around whether applicant recognizes status of QT rupture disk. If disk is assumed to have blown, then containment pressure would rise. With normal levels of RCS activity an applicant would have to determine what the effects on containment radiation would be.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect. Initially no discharge to containment to cause containment P to rise or rad levels to rise.
- B. Incorrect. Initially no discharge to containment to cause containment P to rise.
- C. Incorrect. Initially no discharge to containment to cause containment rad levels to rise.
- D. Correct. There will no effect on containment until rupture disk blows.**

---

Technical Reference(s): **PNS-CS Rev 15c**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **PNS-CS (R7)**

Question Source: **Bank**

Question History: Last NRC Exam: **ONS 2006 NRC**

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**Did not change. GL OK -- Added 1RIA-4 response to each answer to ensure only one correct answer. \* Changed to 1RIA-47. GL OK**

**1 POINT**

**Question 35**

Unit 1 initial conditions:

- Reactor power = 100%
- Switchyard isolation occurs

Current conditions:

- Reactor trip
- CT1 lockout

Based on the above conditions, which ONE of the following states how long after the reactor trip the CC pumps will re-energize and from what source will they be powered?

- A. 21 seconds / 1XL and 1XN
- B. 21 seconds / 1XO and 1XP
- C. 31 seconds / 1XL and 1XN
- D. 31 seconds / 1XO and 1XP

Question 35  
**T2/G1 - kds**

008K2.02 Component Cooling Water

**Knowledge of bus power supplies to the following:** CCW pump, including emergency backup (3.0\*/3.2\*)

**K/A MATCH ANALYSIS**

Requires knowledge of power supplies to CC pumps and how they are powered following a blackout.

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect: Time = 31 sec. Plausible because MFBMP and Load shed add up to 21 seconds if the transfer to standby time is neglected.
- B. Incorrect: Power from XL & XN. Time = 31 sec. Plausible because XO and XP are also 600v supplies to vital equipment. 21 sec plausible because MFBMP and Load shed add up to 21 seconds.
- C. Correct: SWYD isolate – KHU emergency start, MFBMP (20 sec) followed by a load shed (1sec) and a transfer to standby (10 sec) occurs for a total of 31 seconds.**
- D. Incorrect: Power from XL & XN. Plausible because XO and XP are also 600v supplies to vital equipment.

---

Technical Reference(s): **PNS-CC Rev 12a, PNS-PSL Rev 12a**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **PNS-CC Obj R15**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**GL OK -- Changed B and D to a safety related power supply. \* Changed to original. GL OK**

**1 POINT**

**Question 36**

Unit 1 initial conditions:

- Reactor power = 100%

Current conditions:

- BOTH CC pumps have TRIPPED
- RCP seal injection = 8 gpm/pump

Based on current conditions, which ONE of the following describes the continued operation of the RCPs?

- A. RCPs must be secured immediately
- B. RCPs must be secured within 30 minutes
- C. RCPs may continue operation indefinitely
- D. RCP can operate up to 100 hours

Question 36

**T2/G1 - gcw**

008K3.03 Component Cooling System

**Knowledge of the effect that a loss or malfunction of the CCWS will have on the following: RCP (4.1/4.2)****K/A MATCH ANALYSIS**

Question requires knowledge of effect of Loss of CC on operation of the RCPs.

**ANSWER CHOICE ANALYSIS****Answer: C**

- A. Incorrect, plausible because this would be correct if CC and RCP seal injection were lost.
- B. Incorrect, plausible because this the time associated with closing LPSW valves to RCP motors after shutdown.
- C. Correct, per note in AP/20 - "Operation of the RCPs without CC may continue indefinitely provided RCP seal injection is functioning properly to maintain pump temperatures within limits of Encl 5.1 (RCP Immediate Trip Criteria) of AP/16 (Abnormal RCP Operation)."**
- D. Incorrect, 100 hours is plausible because this the time the RCPs can operate without seal return flow.

---

**Technical Reference(s): AP/20 (Loss of Component Cooling) Rev 09**Proposed references to be provided to applicants during examination: **None**Learning Objective: **EAP-APG (R9)**Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis**GL OK**

**1 POINT**

**Question 37**

Unit 1 initial conditions:

- Reactor power = 100%
- A transient occurs

Current conditions:

- RCS pressure = 2130 psig decreasing
- Pzr level = 78 inches stable
- Pzr temperature = 639 °F decreasing

Based on the current conditions, which ONE of the following states the status of the Pzr heaters and why?

- A. All Pzr heaters are OFF to protect the heaters due to low Pzr level
- B. ALL Pzr heater would be energized to increase RCS pressure to normal
- C. Bank 1, 2, and 3 Pzr heaters ONLY will be energized to increase RCS pressure
- D. Bank 2 Pzr heaters will be energized by the Saturation Recovery Circuit to establish saturated conditions in the Pzr

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Question 37

**T2/G1**

010K4.02 Pressurizer Pressure Control

**Knowledge of PZR PCS design feature(s) and/or interlock(s) which provide for the following: Prevention of uncovering PZR heaters (3.0/4.1)**

**K/A MATCH ANALYSIS**

Requires knowledge of PZR low level interlock to protect the PZR heaters.

**ANSWER CHOICE ANALYSIS**

**Answer: A**

- A. Correct, PZR heaters are interlocked to de-energize at < 80 inches to protect the heaters from operating uncovered.**
- B. Incorrect, plausible because all heaters would be normally energized at this RCS pressure.
- C. Incorrect, plausible because all heaters would be normally energized at this RCS pressure. Bank 4 setpoint is 2130 psig. Candidate could believe they had not energized yet.
- D. Incorrect, plausible because bank 2 heaters would be on due the PZR being subcooled.

---

Technical Reference(s): **PNS-PZR R16a**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **PNS-PZR R5**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**GL OK**

**1 POINT**

**Question 38**

Unit 1 initial conditions:

- Reactor power = 100%

Current conditions:

- 1B1 Reactor coolant pump trips

Based on the above conditions, which ONE of the following RPS trips will prevent exceeding the DNBR safety limit?

- A. High flux
- B. Flux/Pump
- C. Flux/Flow/Imbalance
- D. High RCS Temperature

Question 38

**T2/G1 - gcw**

012K5.01 Reactor Protection

**Knowledge of the operational implications of the following concepts as they apply to the RPS: DNB (3.1\*/3.3\*)**

**K/A MATCH ANALYSIS**

Question requires knowledge of the relationship between RPS trips and DNBR.

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect, although the high flux trip is provided to prevent damage to the fuel and fuel clad it will not trip in this case.
- B. Incorrect, this trip looks at the number of RCPs operating versus reactor power instead of RCS flow. If  $\geq 2$  RCPs are lost above 2% power the reactor will trip.
- C. Correct, the trip setpoint with 3 RCP operating is ~ 80% power. After the pump trips and flow decreases the reactor will trip. This trip prevents DNBR from decreasing less than 1.18.**
- D. Incorrect, although core temperature may increase with decrease in RCS flow, it will not result in a reactor trip in this case.

---

Technical Reference(s): **ONS-TSB B 3.3.1**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **IC-RPS R4**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**GL OK**

**1 POINT**

**Question 39**

Unit 1 initial conditions:

- Reactor power = 100%

Current conditions:

- Reactor trip due to Variable Low Pressure

Which ONE of the following sets of detector failures resulted in the above reactor trip?

**ASSUME NO OPERATOR ACTION**

- A. WR RCS pressure A and B fail low
- B. WR RCS Pressure A and B fail high
- C. NR RCS pressure A and E fail low
- D. NR RCS Pressure A and E fail high

Question 39

**T2/G1**

012K6.06 Reactor Protection

**Knowledge of the effect of a loss or malfunction of the following will have on the RPS: Sensors and detectors (2.7\*/2.8)**

**K/A MATCH ANALYSIS**

Requires knowledge of how detectors affect RPS both directly and indirectly.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect: WR RCS pressure A & B failing low would cause ES 1 & 2 to initiate. Full HPI would fill the pressurizer causing and RPS trip on High RCS pressure. Plausible because the signals are failing LOW.
- B. Incorrect: WR RCS pressure A&B failing high has no adverse effects on the plant other than some RCS pressure indication. Plausible because if it were NR RCS pressure A&B it would be correct.
- C. Incorrect: NR RCS pressure failing low will cause Pzr heaters to come on and the Pzr spray valve to stay closed. Eventually the RCS may trip on High RCS pressure. Plausible because the signals are failing LOW.
- D. Correct: NR RCS pressure A & E failing high will be passed through median select to the PORV and Pzr spray valve causing them to open. It will also cause feedwater to increase and control rods to insert (ICS). This will cause actual RCS pressure to decrease rapidly, reaching the RPS trip setpoint for Variable RCS Pressure.**

---

Technical Reference(s): **AP/28 (ICS Instrument Failures) Rev 013**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **IC-RCI (R32, 33, 62)**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**GL OK**

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1 POINT

Question 40

Unit 1 plant conditions:

- A SBLOCA has occurred
- EOP LOSCM tab in progress
- Reactor Building pressure = 25 psig decreasing
- EOP Enclosure 5.12 (ECCS Suction Swap to RBES) in progress
  - RBES has just been aligned to the suction of the LPI Pumps

Based on the above conditions, which ONE of the following describes the initial BWST level response and the required condition(s) for isolating LPI pumps from the BWST?

- A. BWST level initially decreases  
When BWST level is 9 feet and RB level is increasing.
- B. BWST level initially decreases  
When BWST level is less than 6 feet
- C. BWST level initially remains constant  
When BWST level is 9 feet and RB level is increasing.
- D. BWST level initially remains constant  
When BWST level is less than 6 feet

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Question 40  
T2/G1 - gcw

013A1.06 Engineered Safety Features Actuation  
**Ability to predict and/or monitor changes in parameters (to Prevent exceeding design limits) associated with operating the ESFAS controls including: RWST level (3.6/3.9)**

**K/A MATCH ANALYSIS**

Question requires knowledge concerning swapping the ECCS suction from the BWST to the RBES. This swap requires the operation of two ES valves.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect, first part is incorrect. Plausible because if RB pressure were less than 10 psig this would occur. Second part is incorrect. Plausible because this is the conditions required prior to opening 1LP-19 and 20 (RBES Suction Valves).
- B. Incorrect, first part is incorrect. Plausible because if RB pressure were less than 10 psig this would occur. Second part is correct.
- C. Incorrect, first part is correct. Second part is incorrect. Plausible because this is the conditions required prior to opening 1LP-19 and 20 (RBES Suction Valves).
- D. Correct, because RB pressure is greater than 10 psig BWST level will remain constant after the RBES valves are opened. After RB pressure decreases less than 10 psig BWST level will then decrease and at  $\leq 6$  feet the BWST suction valves are closed.**

---

Technical Reference(s): **EOP Enclosure 5.12 (ECCS Suction Swap to RBES) Rev 36**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-LOSCM (R23, R36)**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**Modified 27 to remove BWST level. Modified to ensure only one correct answer.  
GL OK --- Reworded stem for clarity. GL OK**

**1 POINT**

**Question 41**

Unit 1 plant conditions:

- Reactor power = 100%
- RBNS Level is increasing
- LPSW RBCU COOLER Flows are as follows:
  - 1A INLET = 990 gpm
  - 1A OUTLET = 580 gpm
  - 1C INLET = 930 gpm
  - 1C OUTLET = 970 gpm

Based on the conditions above, which ONE of the following describes the condition of the RBC Units, AND the action directed to correct the condition?

- A. The RBCU "C" is leaking,  
Isolate the "C" RBCU outlet, then inlet to prevent water hammer and minimize generation and processing of liquid radwaste.
- B. The RBCU "A" is leaking,  
Isolate the A RBCU outlet, then inlet to prevent water hammer and minimize generation and processing of liquid radwaste.
- C. The RBCU "C" is leaking,  
Isolate the "C" RBCU inlet, then outlet to maintain containment integrity and prevent dilution of the RB Sump.
- D. The RBCU "A" is leaking,  
Isolate the "A" RBCU inlet, then outlet to maintain containment integrity and prevent dilution of the RB Sump.

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Question 41  
**T2/G1 - gcw**

022A2.05 Containment Cooling

**Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Major leak in CCS (3.1/3.5)**

**K/A MATCH ANALYSIS**

Requires knowledge of LPSW flow indication and given indications of a mismatch between the flow indicators, determine which cooler is leaking and the procedural actions directed for the leaking cooler.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect, Incorrect cooler, plausible due to mismatch in flow indication. Requires knowledge that Outlet flow is normally higher than inlet for existing configuration. Order of isolation and reason are also incorrect. Plausible based on recent industry OE related to isolating only the outlet and resulting water hammer event if the supply pressure source is lost and regained.
- B. Incorrect correct cooler, isolation order and reason are as noted in distracter A.
- C. Incorrect, wrong cooler plausible based on reason noted in Distracter A. Correct manipulations and reason.
- D. Correct, correct cooler, manipulations and reason.**

---

Technical Reference(s): **ARG 1SA-9 B9 Rev 30**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **SSS-LPW R10, 11, 15**

Question Source: **Bank**

Question History: Last NRC Exam: **ONS 2005 NRC**

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**GL OK**

**1 POINT**

**Question 42**

Unit 1 initial conditions:

- Time = 0400
- Reactor power = 20%

Current conditions:

- Time = 0401
- RB pressure = 14 psig increasing
- 1TD de-energized

Based on the above conditions, which ONE of the following describes the expected status of the Reactor Building Spray System (RBS)?

- A. 1A RBS pump - OPERATING  
1B RBS pump - OFF  
1BS-1 - OPEN  
1BS-2 - OPEN
- B. 1A RBS pump - OPERATING  
1B RBS pump - OFF  
1BS-1 - OPEN  
1BS-2 - CLOSED
- C. 1A RBS pump - OFF  
1B RBS pump - OPERATING  
1BS-1 - OPEN  
1BS-2 - OPEN
- D. 1A RBS pump - OFF  
1B RBS pump - OPERATING  
1BS-1 - CLOSED  
1BS-2 - OPEN

Question 42

**T2/G1 - gcw**

026A3.01 Containment Spray

**Ability to monitor automatic operation of the CSS, including:** Pump starts and correct MOV positioning (4.3/4.5)

**K/A MATCH ANALYSIS**

Question requires knowledge of RBS operation during an ES actuation and power supplies.

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect, status of BS pumps is correct. Valve position is incorrect. 1BS-2 should be closed. Plausible because the suction valves (BS-3 & 4) are normally open.
- B. Correct, RBS actuates at 10 psig RB pressure. This will cause the RBS pumps to start and the discharge valves (1BS-1/2) to open. 1TD is de-energized which will prevent the "B" BS from starting and 1BS-2 from opening. 1XS-5 powers 1BS-2 and is powered from 1TD via Load Center 1X9.**
- C. Incorrect, status of BS pumps is incorrect. Would be correct for 1TC de-energized. Valve position is incorrect. 1BS-2 should be closed. Plausible because the suction valves (BS-3 & 4) are normally open.
- D. Incorrect, status of BS pumps is incorrect. Would be correct for 1TC de-energized. Second part is consistent with the application of loss of power to pump and valve.

---

Technical Reference(s): **EL-EPD Rev 29a, PNS-BS Rev 11a, OP/1/A/1105/005 Rev 16**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **PNS-BS (R3, R6)**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**GL OK**

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**1 POINT**

**Question 43**

Unit 1 initial conditions:

- Reactor power = 100%
- Troubleshooting in progress on Channel "A" Reactor Building Spray Pressure String

Current conditions:

- The High RB pressure Contact Buffer is removed in Channel "A"
- 1SA-7/D3 (ES RB Spray Pwr Supply Failure or Channel "A" Module Removed) actuated

Based on the above conditions, which ONE of the following describes the impact on the ES channels?

- A. ES Channel 7 and 8 are in a 1 out of 2 trip logic Mode
- B. ES Channel 7 and 8 are in a 2 out of 2 trip logic Mode
- C. ES Channel 5 and 6 are in a 1 out of 2 trip logic Mode
- D. ES Channel 5 and 6 are in a 2 out of 2 trip logic Mode



**1 POINT**

**Question 44**

Unit 3 plant conditions:

- Critical just below the Point of Adding Heat
- The Turbine Bypass Valves are in MANUAL at the Auxiliary Shutdown Panel (ASDP)
- Turbine Header Pressure = 885 psig

Based on the above conditions, which ONE of the following describes **initial** turbine header pressure response if a manual reactor trip is initiated?

Turbine Header Pressure will...

- A. decrease and RCS temperature will decrease until TBVs are closed.
- B. increase to approximately 1010 psig and RCS temperature will increase to 555°F.
- C. remain at approximately 885 psig and RCS temperature will remain relatively constant.
- D. increase to the main steam relief valve settings and RCS temperature will be maintained at approximately 560°F.

Question 44  
**T2 /G1 - gcw**

039K1.06 Main and Reheat Steam  
**Knowledge of the physical connections and/or cause-effect relationships between the MRSS and the following systems: Condenser steam dump (3.1/3.0)**

**K/A MATCH ANALYSIS**

Question requires knowledge of how TBV position affects THP in a given situation.

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect, below POAH, there will be no heat loss caused by the trip. Therefore steam demand should remain relatively constant and no changes should occur.
- B. Incorrect, below POAH, there will be no heat loss caused by the trip. Therefore steam demand should remain relatively constant and no changes should occur.
- C. Correct, will not increase and heat up because TBVs will not close on trip (in manual)**
- D. Incorrect, will not increase and heat up because TBVs will not close on trip (in manual)

---

Technical Reference(s): **STG-ICS Chap 3 Rev 9**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **STG-ICS R10**

Question Source: **Bank, STG121006**

Question History: Last NRC Exam:

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**GL OK**

**1 POINT**

**Question 45**

Unit 1 initial conditions:

- Reactor power = 100%
- ICS is in MANUAL

Current conditions:

- AP/29 (Rapid Unit Shutdown) is initiated to reduce power to 15%

Based on the above conditions and in accordance with AP/29, which ONE of the following describes which Main FDW pump will be secured first and what plant indications will be used to determine when the pump will be removed from service?

- A. 1A Main FDW pump / when a statalarm for FDWP flow at or below minimum is received for the associated Main FDW pump and CTP < 65%
- B. 1A Main FDW pump /  $\approx 325$  MWe
- C. 1B Main FDW pump / when a statalarm for FDWP flow at or below minimum is received for the associated Main FDW pump and CTP < 65%
- D. 1B Main FDW pump /  $\approx 325$  MWe

Question 45

**T2 /G1 - gcw**

059A4.03 Main Feedwater

**Ability to manually operate and monitor in the control room:** Feedwater control during power increase and decrease (2.9\*/2.9)

**K/A MATCH ANALYSIS**

Question requires knowledge of securing a Main FDW during a plant shutdown.

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect, first part is incorrect but plausible if candidate selects wrong pump. Second part is correct.
- B. Incorrect, first part is incorrect but plausible if candidate selects wrong pump. Second part is incorrect. Plausible because this is when the pump is secured during a normal unit shutdown using the OPS At power procedure.
- C. Correct, the "B" Main FDW pump will be secured first. When a statalarm for FDWP flow at or below minimum is received for the associated Main FDW pump and CTP < 65% the Main FDW will be tripped.**
- D. Incorrect, first part is correct. Second part is incorrect. Plausible because this is when the pump is secured during a normal unit shutdown using the OPS At power procedure.

---

Technical Reference(s): **AP/29 (Rapid Unit Shutdown) Rev 08**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-APG R9**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

***Incorporated suggestion. GL OK***

**1 POINT**

**Question 46**

Unit 1 initial conditions:

- Time = 0400
- Reactor power = 100%
- TDEFDW Pump OOS
- Switchyard Isolation occurs

Current conditions:

- Time = 0403
- 1A and 1B MDEFDW Pump operating
- Power has been lost to the HAND/AUTO Station for 1FDW-316

Based on the above conditions, which ONE of the following describes the response of "1B" SG level?

**ASSUME NO OPERATOR ACTION**

- A. Steadily lower to "dryout"
- B. Maintain at 30"
- C. Maintain at 240"
- D. Steadily rise and overflow to the steam lines

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Question 46

**T2 /G1**

061K3.02 Auxiliary / Emergency Feedwater

**Knowledge of the effect that a loss or malfunction of the AFW will have on the following: S/G (4.2/4.4)**

**K/A MATCH ANALYSIS**

Question demonstrates knowledge of the failure modes of FDW-316 and controls and the effect on OTSG level.

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect. Plausible if applicant believes the valve would remain closed (as it is at full power).
- B. Incorrect. It fails to AUTO but the setpoint is incorrect for no RCP's.
- C. Correct. Fails to AUTO in this case and the setpoint is correct for no RCP's.**
- D. Correct. Plausible if applicant assumes the failure mode is the same as for loss of power to the selected control train.

---

Technical Reference(s): **CF-EF Rev 24**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **CF-EF (R34, R37)**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**GL OK**

**1 POINT**

**Question 47**

Unit 2 initial conditions:

- Reactor power = 27%
- PCB-24 (Unit 2 Generator Output Breaker-to Yellow Bus) is OPEN

Current conditions:

- Reactor trip

Based on the above conditions, which ONE of the following describes the MFB breaker operation and the RCP status?

The "N" breakers will open and the....

- A. "E" breakers will NOT close automatically  
RCPs will trip
- B. "E" breakers will close in 1.7 seconds  
RCPs will remain in operation
- C. "E" breakers will close immediately  
RCPs will remain in operation
- D. "E" breakers will close in 21 seconds  
RCPs will trip

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Question 47

**T2 /G1 - gcw**

062K4.03 AC Electrical Distribution

**Knowledge of ac distribution system design feature(s) and/or interlock(s) which provide for the following:** Interlocks between automatic bus transfer and breakers (2.8\*/3.1)

**K/A MATCH ANALYSIS**

Question requires knowledge of the interlock between the N and E breakers when the Main Generator output breaker tied to the 230 KV Switchyard Yellow Bus is open.

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect, first part is correct. Second part is incorrect. The 6900 volt breakers will also have a slow transfer (1.8 sec) but this is less than the 3 seconds required to trip the breakers on under-voltage.
- B. Correct, with 1 Generator breaker open, a slow transfer (1.7 sec. time delay) will occur. RCPs would not trip. The 6900 volt breakers will also have a slow transfer (1.8 sec) but this is less than the 3 seconds required to trip the breakers on under-voltage.**
- C. Incorrect, first part is incorrect. Plausible because this is what would occur on a normal reactor trip. Second part is incorrect. The 6900 volt breakers will also have a slow transfer (1.8 sec) but this is less than the 3 seconds required to trip the breakers on under-voltage.
- D. Incorrect, first part is incorrect. Plausible because this is what would occur on a normal reactor trip with the N/E Auto/Manual switches in manual. Second part is incorrect. The 6900 volt breakers will also have a slow transfer (1.8 sec) but this is less than the 3 seconds required to trip the breakers on under-voltage.

---

Technical Reference(s): **EL-EPD Rev 29a**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EL-EPD R30**

Question Source: **Bank, EL033001**

Question History: Last NRC Exam:

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**GL OK**

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**1 POINT**

**Question 48**

Which ONE of the following is powered from DCA (125VDC Control Power Bus)?

- A. EFWPT Auxiliary Oil Pump
- B. KSF1 Inverter
- C. Main FDW Pump Turbine Control power
- D. KX Inverter

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Question 48

**T2 /G1 - gcw**

063K2.01 DC Electrical Distribution

**Knowledge of bus power supplies to the following: Major DC loads (2.9\*/3.1\*)**

**K/A MATCH ANALYSIS**

Question requires knowledge of loads from the station 125VDC system.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect, powered from the power batteries.
- B. Incorrect, powered from the SSF DC system.
- C. Incorrect, powered from the power batteries.
- D. Correct, powered from DIA.**

---

Technical Reference(s): **EL-DCD Rev 12a**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EL-DCD R4**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**GL OK - Added "125VDC Control Power Bus" noun name to Stem. GL OK**

**1 POINT**

**Question 49**

Unit 1 initial conditions:

- Reactor power = 100%
- ACB-3 closed
- 230 KV Switchyard Voltage sustained at 223.1 KV

Current conditions:

- RCS pressure = 1120 psig
- RB pressure = 3.9 psig

Based on the above conditions, which ONE of the following describes the source of power and the transformer which will energize the Unit 1 Main Feeder Busses?

**ASSUME NO OPERATOR ACTIONS**

- A. ONS Switchyard via CT-1 Transformer
- B. Keowee Unit 1 via CT-4 Transformer
- C. Keowee Unit 2 via CT-1 Transformer
- D. Keowee Unit 2 via CT-4 Transformer

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Question 49  
**T2 /G1 - gcw**

064K4.10 Emergency Diesel Generator  
**Knowledge of ED/G system design feature(s) and/or interlock(s) which provide for the following:** Automatic Load Sequencer: Blackout. (3.5/4.0)

**K/A MATCH ANALYSIS**

Oconee does not have an ED/G. This question is written to require knowledge of the ONS backup power system (Keowee Hydro) and how it will supply power to the unit under a set of conditions.

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect, this would be correct if switchyard voltage was not reduced.
- B. Correct, because 230 KV switchyard voltage is less than 227.468 KV and an ES 1 or 2 signal is present a switchyard isolation will occur. This will cause a Keowee emergency start and because an ES signal is present power will be regained via the underground and CT-4. Since ACB-3 is closed Keowee Unit 1 will supply the MFBs.**
- C. Incorrect, this would be correct if as ES actuation had not occurred.
- D. Incorrect, Keowee Unit 1 is aligned to the underground and ACB-4 (Keowee Unit #2 underground feeder) cannot close. Plausible because this is true for Keowee Unit 1.

---

Technical Reference(s): **EL-EPD Rev 29a**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EL-PSL R24**

Question Source: **Bank, EL052402**

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**GL OK**

**1 POINT**

**Question 50**

Which ONE of the following will DIRECTLY initiate an emergency start signal to BOTH Keowee Units?

- A. STAR<sub>A</sub> relay actuation
- B. Switchyard Isolation Confirm signal
- C. Standby Breaker Close Initiation signal
- D. Keowee Emergency Start Channel "B" is manually actuated from Unit 2's Cable Room.

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Question 50  
**T2 /G1 - gcw**

064A3.01 Emergency Diesel Generator

**Ability to monitor automatic operation of the ED/G system, including:** Automatic start of compressor and ED/G (4.1/4.0)

**K/A MATCH ANALYSIS**

Question requires knowledge of the Keowee emergency start signals. Since Oconee does not have Emergency Diesel Generators this KA is used to address Keowee Hydro which is the Oconee emergency power source.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect, STAR does not Emergency Start Keowee
- B. Incorrect, Switchyard Isolation Confirm signal will not Emergency Start Keowee. Plausible because Switchyard Isolation actuation will start Keowee.
- C. Incorrect, SBCI does not Emergency Start Keowee.
- D. Correct, will emergency start BOTH Keowee Units**

---

Technical Reference(s): **EL-PSL Rev 12a**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EL-PSL (R2)**

Question Source: **Bank, EL050203**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**GL OK**

**1 POINT**

**Question 51**

Unit 1 initial conditions:

- Reactor power = 100%
- 1A GWD tank release in progress
- 1RIA-38 OOS

Current conditions:

- Loss of power to RM-80 skid of 1RIA-37
- 1SA8/B9 RM PROCESS MONITOR RADIATION HIGH in alarm
- 1SA8/B10 RM PROCESS MONITOR FAULT in alarm

Based on the above conditions, which ONE of the following states the status of 1GWD-4 (A GWD TANK DISCHARGE) and stipulations for the release?

- A. 1GWD-4 will remain open / GWD tank release may continue if 1RIA-37 is re-energized within one hour.
- B. 1GWD-4 will automatically close / GWD tank release may be re-initiated as long as 1RIA-37 is re-energized within one hour.
- C. 1GWD-4 will remain open / GWD tank release may continue as long as two independent samples are obtained.
- D. 1GWD-4 will automatically close / GWD tank release may be re-initiated as long as two independent samples are obtained prior to the release.

Question 51

**T2/G1 -kds**

073A2.01 Process Radiation Monitoring

**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 (2.5/2.9\*)**

**K/A MATCH ANALYSIS**

Requires knowledge of impact of a loss of power to an RIA skid and the SLC actions required due to the failure.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect, 1GWD4 will close. Plausible because a release is allowed to continue for "Planned" outages of instrumentation < 1 Hr.
- B. Incorrect, a release would be allowed to be re-initiated if it were a "Planned" outage of < 1 Hr. Plausible because if it were a planned outage (not de-energized detector) it would be correct.
- C. Incorrect, 1GWD 4 will close. Plausible because second part is correct.
- D. Correct, if a loss of power to the RM80 skid for an RIA occurs, any interlocks for that RIA will occur as if a HIGH ALARM had occurred. SLC16.11.3 requires two independent samples for any subsequent releases if RIA 37/38 are not available.**

---

Technical Reference(s): **SLC 16.11.3, ARG 1SA8/B9 & 10 Rev 19, AP/18 Rev 15**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **WE-GWD (R13), RAD-RIA (R2 & 15)**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

GL OK

**1 POINT**

**Question 52**

Unit 1 initial conditions

- Mode 5
- RB Purge in operation

Current conditions:

- Radiation levels in the RB increasing

Based on current conditions, which ONE of the following describes the operation of the Unit Vent Radiation Monitors 1RIA-45 and 1RIA-46 when the switchover acceptance range setpoint is reached?

1RIA-45 will read \_\_\_\_\_ and 1RIA-46 will provide \_\_\_\_\_

- A. offscale high / only alarm and unit vent radiation level indication.
- B. offscale high / the same interlock functions that RIA-45 performs.
- C. ZERO / only alarm and unit vent radiation level indication.
- D. ZERO / the same interlock functions that RIA-45 performs.

Question 52

**T2 /G1 -kds**

073A1.01 Process Radiation Monitoring

**Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRM system controls including: Radiation Levels (3.2/3.5)**

**K/A MATCH ANALYSIS**

Requires knowledge of 1RIA-45 & 46 interrelation, automatic actions and indications on increasing Radiation levels

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect, RIA-45 will read zero and RIA-46 will provide the same interlock functions as RIA-45 (which would include tripping Purge fans and closing Purge valves).
- B. Incorrect, RIA- 45 will read zero.
- C. C. Incorrect, RIA-46 will provide same interlock function as RIA-45.
- D. D. Correct, RIA-45 will read zero and RIA-46 will provide the same interlock functions as RIA-45 (which would include tripping Purge fans and closing Purge valves).**

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Technical Reference(s): **RAD-RIA Rev 09**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **RAD-RIA (R2)**

Question Source: **Bank, RAD011501**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**Added bullet to clarify question and make "B" plausible. >>> Removed bullet "1RIA-45 interlocks inoperable". GL OK**

**1 POINT**

**Question 53**

Unit 1 and 2 initial conditions:

- A & B LPSW pump operating

Current conditions:

- 1SA9/A9 LPSW HEADER A PRESS LOW
- A LPSW pump amps = 15 - 35 fluctuating
- B LPSW pump amps = 55 stable
- LPSW HDR PRESS = rapidly fluctuating between 60 & 75 psig

Based on current conditions, which ONE of the following describes the status of the LPSW pumps and what actions are directed by plant procedures?

- A. The A LPSW pump is cavitating / Place the Unit 1/2 STANDBY LPSW PUMP AUTO START CIRCUIT in DISABLE then stop LPSW Pump A and start LPSW Pump C
- B. The A LPSW pump has a sheared shaft / Place the Unit 1/2 STANDBY LPSW PUMP AUTO START CIRCUIT in DISABLE then stop LPSW Pump A and start LPSW Pump C
- C. The A LPSW pump is cavitating / Start LPSW Pump C then stop LPSW Pump A
- D. The A LPSW pump has a sheared shaft / Start LPSW Pump C then stop LPSW Pump A

Question 53

**T2 /G1 -kds**

076A4.01 Service Water

**Ability to manually operate and/or monitor in the control room: SWS pumps  
(2.9/2.9)**

**K/A MATCH ANALYSIS**

Requires knowledge of LPSW pump auto-start circuitry and abnormal procedure actions for starting LPSW pumps.

**ANSWER CHOICE ANALYSIS**

**Answer: A**

- A. Correct: Indication given is consistent with pump cavitation on LPSW Pump A. LPSW Pump B amps are at the normal value for existing conditions. AP/24 procedural direction for cavitation is to disable the auto start feature then stop the affected pump.**
- B. Incorrect: Sheared shaft indication would be low amps vice fluctuating amps. Plausible as it is the correct pump. The actions given are procedurally correct if candidate decides the pump is not cavitating.
- C. Incorrect: Wrong pump is referenced as cavitating. Plausible if candidate misinterprets the data given. Procedure direction is consistent if wrong pump is selected.
- D. Incorrect: The wrong pump is selected. Sheared shaft indication would be low amps vice fluctuating amps. The actions given are procedurally correct if candidate decides the pump is not cavitating and are consistent with misinterpreting the pump affected.

---

Technical Reference(s): **AP/24 (Loss of LPSW) Rev 22**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **SSS-LPW Obj R15, EAP-APG (R9)**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**GL OK**

**1 POINT**

**Question 54**

Unit 1 initial conditions:

- Reactor power = 100%
- Power reduction to 70% initiated to secure RCP
- STANDBY 1 Backup IA Compressor start
- IA pressure = 91 psig decreasing
- AP/22 (Loss of Instrument Air) initiated

Current conditions:

- IA pressure = 85 psig stable
- Reactor power = 80% decreasing
- Total FDW flow = 9.9 E6 lbm/hr stable

Based on current conditions, which ONE of the following describes the actions directed by AP/22?

- A. Trip the reactor and BOTH MFWPs
- B. Dispatch operator to Manually OPEN 1CC-8
- C. Dispatch operator to throttle 1HP-31 to ~ 32 gpm
- D. Isolate the LPSW supply to the RB Aux Coolers

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Question 54

**T2 /G1 -kds**

078G2.4.31 Instrument Air

**Knowledge of annunciator alarms, indications, or response procedures. (4.2/4.1)**

**K/A MATCH ANALYSIS**

Requires knowledge of Abnormal Procedure for Loss of Instrument Air procedure.

**ANSWER CHOICE ANALYSIS**

**Answer: A**

- A. **Correct: Per AP/22 IAAT step 4.3: IAAT feedwater flow CANNOT be controlled, THEN Trip Rx and Trip all Main FDW pumps.**
- B. Incorrect: Operator is not dispatched until IA pressure decreases to < 80 psig. Plausible because would be correct is IA pressure decreased to < 80 psig.
- C. Incorrect: Operator is not dispatched until IA pressure decreases to < 80 psig. Plausible because would be correct is IA pressure decreased to < 80 psig.
- D. Incorrect: Action is directed IAAT IA Header pressure decreases to <60 psig.

---

Technical Reference(s): **AP/22 (Loss of Instrument Air) Rev 24**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-APG R9**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**GL OK**

**1 POINT**

**Question 55**

Unit 1 initial conditions:

- LOCA
- RB Pressure = 4.5 psig increasing
- RCS Pressure = 1500 psig decreasing

Current conditions:

- RB Pressure = 2.5 psig stable
- RCS Pressure = 1800 psig stable
- ES reset is desired

Based on the current conditions, which ONE of the following describes the components that must be reset in order to allow the HPIPs ES Logic to be reset?

- A. HPI Trip Bistables in Analog Channels A/B/C / Reset ES Ch 1&2 Digital Channels
- B. HPI and RB Pressure Trip Bistables in Analog Channels A/B/C / Reset ES Ch 1&2 Digital Channels
- C. HPI Trip Bistables in Analog Channels A/B/C / Reset ES Ch 3&4 Digital Channels
- D. HPI and RB Pressure Trip Bistables in Analog Channels A/B/C / Reset ES Ch 3&4 Digital Channels

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Question 55

**T2 /G1**

103K1.08 Containment

**Knowledge of the physical connections and/or cause effect relationships between the containment system and the following systems: SIS, including action of safety injection reset (3.6/3.8)**

**K/A MATCH ANALYSIS**

Requires knowledge of HPIP reset following ES (Containment pressure) actuation.

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect: Analog Reset requires resetting both the HPI Bistable and the RB Pressure Bistable. Plausible due to the fact that the 10 psig RB Pressure trip is self resetting but the 4 psig Bistable does not. Digital Channels are correct
- B. Correct: Analog Reset requires resetting both the HPI Bistable and the RB Pressure Bistable. Digital Channels are correct**
- C. Incorrect: Analog Reset requires resetting both the HPI Bistable and the RB Pressure Bistable. Plausible due to the fact that the 10 psig RB Pressure trip is self resetting but the 4 psig Bistable does not. Digital Channels are incorrect requires knowledge that Digital Channels 3 & 4 are for LPI vice HPI.
- D. Incorrect: Analog Reset requires resetting both the HPI Bistable and the RB Pressure Bistable. Digital Channels are incorrect requires knowledge that Digital Channels 3 & 4 are for LPI vice HPI.

---

Technical Reference(s): **EOP Encl 5.41 (ES Recovery) Rev 36**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **IC-ES (R13, R17)**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**GL OK**

**1 POINT**

**Question 56**

Unit 1 initial conditions:

- Time 0900
- Reactor power = 68%
- CR group 2 rod 3 dropped into the core
- 1B2 RCP secured
- 1SA4/C1 QUADRANT POWER TILT in alarm

Current conditions

- Time 1300
- Encl 4.15 (Recovery of Dropped/Misaligned Safety or Regulating Control Rod With Diamond In automatic) of OP/1/A/1105/019 (Control Rod Drive System) in progress.
- Reactor Engineering has determined no maneuvering limitations other than those specified by the procedure need to be applied

Based on above conditions, which ONE of the following states the maximum reactor power allowed by Tech Spec and during the recovery of the dropped control rod, what procedural limitations are required for the rate of control rod withdrawal?

- A. 60% / Withdrawn with no designated wait periods
- B. 45% / Withdrawn with no designated wait periods
- C. 60% / Withdrawn in 10% increments spaced 30 min apart
- D. 45% / Withdrawn in 10% increments spaced 30 min apart

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Question 56

**T2 /G2 - kds**

001A4.14 Control Rod Drive

**Ability to manually operate and/or monitor in the control room:** Resetting rod control logic while recovering from misaligned rod, using instrument Tech-Specs (3.0/3.4)

**K/A MATCH ANALYSIS**

Requires knowledge of procedures for recovery of a dropped control rod and TS requirements for imbalance.

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect, required to reduce power to < 60% of allowed thermal power (45%). Plausible because 60% would be correct if four RCPs were operating.
- B. Correct, TS 3.2.3 Quadrant Power Tilt requires power reduction to < 60% of allowed thermal power (45%). This is also required by the Control Rod Drive Procedure. If recovering CR within 24 hours, no wait period is required in between incremental CR withdrawals.**
- C. Incorrect, required to reduce power to < 60% of allowed thermal power (45%). Plausible because 60% would be correct if four RCPs were operating..
- D. Incorrect, if recovering CR within 24 hours, no wait period is required in between incremental CR withdrawals. Plausible because if it were > 24 hours, this answer would be correct.

---

Technical Reference(s): **OP/1/A/1105/019 R12, TS 3.2.3 Quadrant Power Tilt Amend. 300**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **SF-114 Obj R4**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**GL OK**

**1 POINT**

**Question 57**

Unit 1 Conditions

0800

- Reactor power = 100% stable
- Pzr level = 210" decreasing
- RC MAKE UP FLOW = 120 gpm increasing
- 1RC-66 Relief Outlet Temp = 118°F increasing slowly
- Quench Tank level = 86 inches stable
- AP/2 (RCS Leakage) initiated

0810

- RC MAKE UP FLOW = 160 gpm increasing
- Pzr level = 190" decreasing

In accordance with AP-2, which ONE of the responses below answers the following?

- a) What is the required action for conditions at 0800?
- b) What is the required action for conditions at 0810?

- A. Close 1RC-4 / Initiate rapid unit shutdown
- B. Close 1RC-4 / Trip the reactor
- C. Close 1HP-5 / Initiate rapid unit shutdown
- D. Close 1HP-5 / Trip the reactor



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**1 POINT**

**Question 58**

Unit 1 plant conditions:

- Reactor power = 100%
- 1HP-120 (RC Volume Control) has failed CLOSED due to controller malfunction
- 1HP-5 (Letdown Isolation) is CLOSED
- PZR level = 210 inches
- Total HPI Nozzle Warming line flow = 8 gpm

Based on the above conditions, which ONE of the following will be PZR Level (inches) in one hour?

**Assume:**

- **No additional operator actions**
- **RCS Temperature remains constant**
- **No thermal expansion of the water used for makeup**

A. 275

B. 295

C. 310

D. 330



**1 POINT**

**Question 59**

Unit 1 initial conditions:

- Time = 0400
- Reactor power = 100%

Current conditions:

- Time = 0401
- Control Rods are Inserting
- Neutron Error is Negative
- Feedwater flow is Increasing
- SG levels are increasing
- RPS Channel A trip

Based on the current conditions, which ONE of the following malfunctions has occurred?

- A. Controlling NI signal has failed HIGH
- B. Controlling RCS NR pressure failed LOW
- C. Controlling Turbine Header Pressure failed HIGH
- D. Controlling Tave failed LOW

Question 59

**T2 /G2 - kds**

015K3.02 Nuclear Instrument

**Knowledge of the effect that a loss or malfunction of the NIS will have on the following: CRDS (3.3\*/3.5\*)**

**K/A MATCH ANALYSIS**

Requires knowledge of failed controlling NI signal will have on the ICS system including control rod movement.

**ANSWER CHOICE ANALYSIS**

**Answer: A**

- A. Correct: Controlling NI failure will send a signal to ICS that will cause the Control Rods to insert and well as one RPS Channel to trip on High Flux.**
- B. Incorrect: NR pressure failing low results in an RPS Trip. The ICS would respond to this failure however the response would be to withdraw rod and lower feedwater
- C. Incorrect: Turbine header Pressure does not have a direct input to ONE RPS Channel. Plausible because it will cause the other stated effects.
- D. Incorrect: Tave failing Low will not give an RPS channel trip. Plausible because the ICS would respond to this failure however the response would be to withdraw rod and lower feedwater

---

Technical Reference(s): **SAE-L 066 Rev 10a**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **SAE-L 066 Obj R1**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**GL OK -- Added time to stem and "controlling" to each answer for clarity. GL OK**

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1 POINT

Question 60

As indicated on the ICCM plasma display, which ONE of the following describes the lowest indicated CETC temperature (°F) at which core uncover is certain AND the indicated CETC temperature when fuel melt is occurring?

- A. 1200 / 5000
- B. 1200 / 2500
- C. 2200 / 5000
- D. 2200 / 2500

Question 60

**T2 /G2 - kds**

017K5.01 In-core Temperature Monitor

**Knowledge of the operational implications of the following concepts as they apply to the ITM system: Temperature at which cladding and fuel melt (3.1/3.9)**

**K/A MATCH ANALYSIS**

Requires knowledge of In-core thermocouple range and core damage thresholds.

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect: ICC Tab uses 1200°F as indication of core uncover. 2<sup>nd</sup> part is plausible as Fuel Melt Temp is 5000°F however upper end of CETC range is 2500°F
- B. Correct: ICC Tab uses 1200°F as indication of core uncover. Fuel Melt Temp is 5000°F however upper end of CETC range is 2500°F**
- C. Incorrect: 2200°F is plausible as it is ECCS Acceptance criteria for peak clad temperature. 2<sup>nd</sup> part is plausible as Fuel Melt Temp is 5000°F however upper end of CETC range is 2500°F
- D. Correct: 2200°F is plausible as it is ECCS Acceptance criteria for peak clad temperature. 2500°F is correct as noted above.

---

Technical Reference(s): **IC-RCI Rev 18c, EAP-ICC Rev 7, TA-SA Rev 9**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **IC-RCI (R1), TA-SA (R2)**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**GL OK -- Added on plasma display to stem. GL OK**

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**1 POINT**

**Question 61**

Which ONE of the following describes who determines that a RB Continuous Release is allowed and after it is started what are the requirements for sampling the RB atmosphere in accordance with OP/1102/014 (RB Purge System)?

- A. Shift RP / Release may continue indefinitely after initial 24 hours without submitting daily sample requests.
- B. Shift RP / Release may continue indefinitely provided RP assigns a new GWR number and sample results are entered in the Unit Log every 24 hours.
- C. CRSRO / Releases may continue indefinitely after initial 24 hours without submitting daily sample requests.
- D. CRSRO / Release may continue indefinitely provided RP assigns a new GWR number and sample results are entered in the Unit Log every 24 hours.

Question 61

**T2 /G2**

029A2.04 Containment Purge

**Ability to (a) predict the impacts of the following malfunctions or operations on the Containment Purge System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations:** Health physics sampling of containment atmosphere (2.5\*/3.2\*)

**K/A MATCH ANALYSIS**

Requires knowledge of HP sample requirements for a continuous RB purge and who can initiate a continuous release.

**ANSWER CHOICE ANALYSIS**

**Answer: A**

- A. Correct, RP determines when to put the RB on continuous release. Once on continuous release the RB is not required to be sampled.**
- B. Incorrect, first part is correct. The second part is incorrect. Plausible because this is the normal required sampling frequency.
- C. Incorrect: first part is incorrect. Plausible because this is who normally makes decisions about the unit. Second part is correct.
- D. Incorrect: first part is incorrect. Plausible because this is who normally makes decisions about the unit. The second part is incorrect. Plausible because this is the normal required sampling frequency.

---

Technical Reference(s): **OP/1/A/1102/014 (RB Purge) Rev , PNS-RBP Rev 10**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **PNS-RBP Obj R4,5,8**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**

Comprehension or Analysis

***Wrote new question. GL OK - Fixed KA analysis. -- Reworded B and D to ensure one correct answer.***

**1 POINT**

**Question 62**

Unit 1 plant conditions:

- Reactor power = 18% decreasing
- 1SA2/E8, MS STM GEN "A" LEVEL LOW LIMIT in alarm
- 1SA2/E9, MS STM GEN "B" LEVEL LOW LIMIT in alarm
- 1A SG level = 25" SUR stable
- 1B SG level = 25" SUR stable
- 1A SG Loop Tave = 580 °F slowly decreasing
- 1B SG Loop Tave = 578 °F slowly decreasing
- Tave Setpoint = 579 °F

Based on the above conditions, which ONE of the following states the validity of the SG Low Level Limit Stat Alarms?

- A. ONLY 1A SG Stat Alarm is valid
- B. ONLY 1B SG Stat Alarm is valid
- C. BOTH 1A and 1B SG Stat Alarms are valid
- D. Neither 1A and 1B SG Stat Alarms are valid

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Question 62

**T2/G2 - kds**

035G2.4.46 Steam Generator

**Ability to verify that the alarms are consistent with the plant conditions. (4.2/4.2)**

**K/A MATCH ANALYSIS**

Requires knowledge of stat alarm / interlock setpoints.

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect: 1A Loop Tave still above setpt. Plausible because 25" is part of setpt for stat alarm.
- B. Correct: 1B SG LLL setpt is 25" SUR AND 1B Tave < setpt**
- C. Incorrect: 1A Loop Tave still above setpt. Plausible because 25" is part of setpt for stat alarm.
- D. Incorrect: 1B SG LLL valid. Plausible because if either set pt were above setpt, it would be correct.

---

Technical Reference(s): **ARG OP/1/A/6101/002; 1SA-02, E8 Rev 21**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **STG-ICS Obj R17**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**Added SG to C and D to be consistent with A and B. GL Ok**

**1 POINT**

**Question 63**

Unit 3 initial conditions:

- Time = 0400
- Reactor power = 25%
- EHC DISCHARGE HEADER PRESSURE = 1600 psig
- TURBINE BEARING OIL PRESSURE = 22 psig decreasing

Current conditions:

- Time = 0401
- EHC DISCHARGE HEADER PRESSURE = 1200 psig
- TURBINE BEARING OIL PRESSURE = 7 psig increasing

Based on the current conditions, which ONE describes the response of the Main Turbine and the RPS system?

The Main Turbine will trip due to low...

- A. EHC DISCHARGE HEADER PRESSURE and RPS will trip the reactor.
- B. EHC DISCHARGE HEADER PRESSURE and RPS will NOT trip the reactor.
- C. TURBINE BEARING OIL PRESSURE and RPS will trip the reactor.
- D. TURBINE BEARING OIL PRESSURE and RPS will NOT trip the reactor.

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Question 63  
**T2 /G2 - gcw**

045K1.18 Main Turbine Generator

**Knowledge of the physical connections and/or cause effect relationships between the MT/G system and the following systems: RPS (3.6/3.7)**

**K/A MATCH ANALYSIS**

Question requires knowledge of Main Turbine trips and when the MT to Reactor trip is bypassed.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect, first part is incorrect. Plausible because this trip would occur if EHC pressure is less than 1100 psig (requires knowledge of trip setpoint). Second part is incorrect. Plausible because it would be correct if reactor power were greater than 29.75%.
- B. Incorrect, first part is incorrect. Plausible because this trip would occur if EHC pressure is less than 1100 psig (requires knowledge of trip setpoint). Second part is correct.
- C. Incorrect, first part is correct. Second part is incorrect. Plausible because it would be correct if reactor power were greater than 29.75%.
- D. Correct, the turbine will trip on low Bearing Oil pressure (setpoint is  $\leq 8$ psig). The reactor will NOT trip because the MT to reactor trip is bypassed below 27.75% power.**

---

Technical Reference(s): **IC-RPS Rev 15**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **IC-RPS R3**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**GL OK -- Removed generator output bullet to reduce reading.**

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1 POINT

Question 64

Initial plant conditions:

- All units 100% power
- Unit 1 Gaseous Waste Release (GWR) is planned
- 1RIA-37 is inoperable due to a failed source check
- 1RIA-37 background is 1.3 e+03 cpm
- 1RIA-38 background is 1.0 e+01 cpm

Current plant conditions:

- GWD Tank Sample Request recommends resetting RIA's as follows:
  - 1RIA-37 at 800 cpm above background
  - 1RIA-38 at 30 cpm above background

Based on the above conditions, which ONE of the following describes the correct setpoints used for 1RIA 37 & 1RIA-38?

- A. 1RIA-37 is set to 2.1 e+03, 1RIA-38 is set to 4.0 e+01
- B. 1RIA-37 is set to 0.0, 1RIA-38 is set to 4.0 e+01
- C. 1RIA-37 is set to 2.1 e+03, 1RIA-38 is set to 3.0 e+01
- D. 1RIA-37 is set to 0.0, 1RIA-38 is set to 3.0 e+01

Question 64

**T2 /G2**

072A1.01 Area Radiation Monitoring

**Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ARM system controls including:  
Radiation levels (3.4/3.6)**

**K/A MATCH ANALYSIS**

Question requires knowledge of RIA locations and functions.

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect: 1RIA-37 is directed to be set at 0.0 if it is inoperable. Plausible as the 1RIA-37 setpoint is the value obtained by adding background to the setpoint given. Second part is correct.
- B. Correct: 1RIA-37 is directed to be set at 0.0 if it is inoperable. 1RIA-38 setpoint + background is 4.0 e+01 cpm**
- C. Incorrect: 1RIA-37 is directed to be set at 0.0 if it is inoperable. Plausible as the 1RIA-37 setpoint is the value obtained by adding background to the setpoint given. 1RIA 38 setpoint is the value obtained by neglecting to add background to the setpoint given.
- D. Incorrect: 1RIA-37 is directed to be set at 0.0 if it is inoperable. Plausible as the 1RIA-37 & 1RIA 38 setpoints are the values obtained by neglecting to add background to the setpoints given.

---

Technical Reference(s): **RAD-RIA Rev 9, OP/1-2/A/1104/018**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **RAD-RIA R15, WE-GWD R11**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

***Underlined inoperable in the stem. >>>> Added "due to a failed source check" to stem". Verify source check failure will cause RIA to be inoperable.***

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**1 POINT**

**Question 65**

Unit 1 plant conditions:

- 1SA3/B6 (FIRE ALARM) actuated

Based on the above conditions, which ONE of the following describes the status of the Fire Alarm Control Panel and 1SA3/B6 Stat Alarm?

- A. Only ONE alarm location can be displayed until the initial alarm is cleared and reset. 1SA3/B6 can alarm again as soon the existing Fire Alarm Control Panel alarm(s) are acknowledged.
- B. Multiple alarms can be displayed using the Prev/Next Switch to scroll before any alarms are reset. 1SA3/B6 can not alarm again until the condition has cleared and current Fire Alarm Control Panel Alarm is reset.
- C. Only ONE alarm location can be displayed until the initial alarm is cleared and reset. 1SA3/B6 can not alarm again until the condition has cleared and current Fire Alarm Control Panel Alarm is reset.
- D. Multiple alarms can be displayed using the Prev/Next Switch to scroll before any alarms are reset. 1SA3/B6 can alarm again as soon the existing Fire Control Panel alarm(s) are acknowledged.

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Question 65

**T2 /G2**

086A4.02 Fire Protection

**Ability to manually operate and/or monitor in the control room:** Fire detection panels (3.5/3.5)

**K/A MATCH ANALYSIS**

Requires knowledge of Fire Control Panel operation.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect: The Fire Control Panel contains a previous/next switch that is used to scroll through all of the alarms on the display unit. Plausible because the Fire Control Panel only contains one alarm.
- B. Incorrect: As soon as the Fire Control Panel alarms are acknowledged, the Reflash Unit allows any new fire alarms to actuate the Control Room alarm. Plausible because the Annunciator Trouble Stat Alarms will be able to alarm if the initial alarm is cleared and reset.
- C. Incorrect: The Fire Control Panel contains a previous/next switch that is used to scroll through all of the alarms on the display unit. Plausible because the Fire Control Panel only contains one alarm.
- D. Correct: The Fire Control Panel contains a previous/next switch that is used to scroll through all of the alarms on the display unit. As soon as the Fire Control Panel alarms are acknowledged, the Reflash Unit allows any new fire alarms to actuate the Control Room alarm.**

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Technical Reference(s): **IC-FDS Rev 12**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **IC-FDS Obj R5**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**GL OK**

**1 POINT**

**Question 66**

Unit 1 plant conditions:

- MODE 6
- Reactor shutdown 5 days ago
- Defueling in progress
- 1RIA-3 (Fuel Transfer Canal Monitor) has been declared out of service
- Repair expected to take 4 hours
- Fuel handling was suspended in the Reactor Building when 1RIA-3 failed

Based on the above conditions, which ONE of the following describes the status of fuel handling operations in the Reactor Building?

- A. Fuel handling activities can resume as long as the Main Fuel Bridge Area Monitor remains operable.
- B. Fuel handling activities can resume as long as 1RIA-49 (RB Vent Gas) remains operable.
- C. Fuel handling activities cannot be resumed until 1RIA-3 is declared operable.
- D. Fuel handling activities can resume using a portable instrument that has the appropriate range and sensitivity.

Question 66

**T3 - gcw**

G2.1.36

**Knowledge of procedures and limitations involved in core alterations. (3.0/4.1)**

**K/A MATCH ANALYSIS**

Question requires knowledge of refueling procedures and limitations of operation over the Fuel Transfer Canal (FTC).

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect: Main Fuel Bridge Area Monitor not a replacement for 1RIA-3. Plausible because RIA is required.
- B. Incorrect: 1RIA-49 not a replacement for 1RIA-3. Plausible because RIA does monitor RB atmosphere and is required for fuel movement.
- C. Incorrect: 1RIA-3 not required for fuel movement if a portable RIA is put in service.
- D. Correct: per the OP/1/A/1502/007 (Operations Defueling/Refueling Responsibilities) L&P.**

---

Technical Reference(s): **OP/1/A/1502/007 (Operations Defueling/Refueling Responsibilities) Rev 79**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **FH-FHS R25**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**Modified "C" to make more plausible. GL OK --- Rewrote question because ROs do not enter the RB during fuel movement. New question tests RO responsibilities during fuel movement. GL OK**

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**1 POINT**

**Question 67**

An ECP is calculated for Unit 1 at the following conditions:

- 400 EFPD
- 535 °F RCS Temperature
- 200 ppmB RCS boron concentration
- (-1.47%)  $\Delta k/k$  Xenon/Samarium Concentration

The Estimated Critical Position is calculated to be CRD Group 7 at 30% w/d

Which ONE of the following changes will result in an Estimated Critical Position of CRD Group 7 greater than 30% w/d?

- A. 395 EFPD
- B. 537°F RCS temperature
- C. (-1.26%)  $\Delta k/k$  Xenon/Samarium Concentration
- D. 190 ppmB RCS boron concentration

Question 67

**T3 - gcw**

G2.1.43

**Ability to use procedures to determine the effects on reactivity of plant changes, such as reactor coolant system temperature, secondary plant, fuel depletion, etc. (4.1/4.3)**

**K/A MATCH ANALYSIS**

Question requires knowledge of the affect of various plant parameters on reactivity and how this would affect an ECP.

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect, decreasing EFPD increases Core Excess Reactivity and Group 7 must be inserted to compensate.
- B. Correct, increasing RCS Temp adds negative reactivity. Group 7 would have to withdraw to compensate.**
- C. Incorrect, decreasing Xenon Concentration adds positive reactivity. Group 7 would have to insert to compensate.
- D. Incorrect, decreasing Boron Concentration adds positive reactivity. Group 7 would have to insert to compensate.

---

Technical Reference(s): **RT-RBC Rev 10**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **RT-RBC Obj R3**

Question Source: **Modified Bank, RT141005**

Question History: Last NRC Exam:

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

***Incorporated suggestion and made a different answer correct. GL OK***

**1 POINT**

**Question 68**

Unit 1 and 3 Conditions:

- Mode 4
- RCS Cooldown in Progress
- LPI in-service
- RCP's secured

Which ONE of the following correctly describes the actions directed by procedures to reduce the cooldown rate of the RCS on each of the Units?

- A. Unit 1 - Raise LPI Flow through the LPI Cooler Bypass Line while reducing LPI Flow through the cooler  
Unit 3 - Lower LPSW Flow through the in-service LPI Cooler
- B. Unit 1 - Lower LPSW Flow through the in-service LPI Cooler  
Unit 3 - Raise LPI Flow through the LPI Cooler Bypass Line while reducing LPI Flow through the cooler
- C. Unit 1 - Lower LPI Flow through the LPI Cooler Bypass Line while raising LPI Flow through the cooler  
Unit 3 - Raise LPSW Flow through the in-service LPI Cooler
- D. Unit 1 - Raise LPSW Flow through the in-service LPI Cooler  
Unit 3 - Lower LPI Flow through the LPI Cooler Bypass Line while raising LPI Flow through the cooler

Question 68

T3 - jmb

G2.2.4

**Ability to explain the variations in control board/control room| layouts, systems, instrumentation, and procedural actions between units at a facility. (3.6/3.6)**

**K/A MATCH ANALYSIS**

Requires knowledge of LPI System differences between the units and how their procedures control RCS Temperature.

**ANSWER CHOICE ANALYSIS****Answer: B**

- A. Incorrect: Unit 1 temperature control is accomplished by adjusting LPSW Flow through the LPI Cooler. 1<sup>st</sup> part is plausible as it is the direction provided for Unit 3 Temperature control. Unit 3 distracter is plausible as it is the direction provided for Unit 1.
- B. Correct: Unit 1 temperature control is accomplished by adjusting LPSW Flow through the LPI Cooler. Unit 3 Temperature control is accomplished by adjusting flow through the cooler and bypass lines. Raising flow through bypass while lowering through the cooler will raise cooler outlet temp and reduce RCS C/D Rate.**
- C. Incorrect: Incorrect as noted in distracter A. Actions would result in an decrease in Cooler Outlet Temp which would increase the RCS C/D Rate.
- D. Incorrect: Correct parameter is controlled however direction of manipulation is incorrect and would result in increased RCS C/D rate.

---

Technical Reference(s): **PNS-LPI Rev 22a**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **PNS-LPI Obj R6,7**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

***Underlined "reduce". GL OK --- Added "LPI" to answers to ensure a correct answer. GL OK***

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**1 POINT**

**Question 69**

Unit 1 plant conditions:

- EFDWP Discharge Startup Checklist in progress
- 1C-156 (TD EFDWP Normal Supply) checklist position is OPEN
- 1C-156 (TD EFDWP Normal Supply) is Red Tagged CLOSED per an R&R to repair a packing leak

Based on the above conditions, which ONE of the following describes the process for closing the valve checklist (if any)?

- A. Review the impact of the out of position valve, list the R&R number on the checklist and initial
- B. Review the impact of the out of position valve, list the Work Request number on the checklist and initial
- C. Review the impact of the out of position valve, N/A the block and note on the checklist that an R&R is outstanding and initial
- D. The valve checklist cannot be closed with a valve out of position

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Question 69

**T3 - kds**

G2.2.14

**Knowledge of the process for controlling equipment configuration or status.**  
(3.9/4.3)

**K/A MATCH ANALYSIS**

Requires knowledge of configuration control.

**ANSWER CHOICE ANALYSIS**

**Answer: A**

- A. Correct: Per SOMP 4-2, Review the impact of the out of position valve, list the R&R number on the checklist and initial**
- B. Incorrect: Do not list the work request number. Plausible because you do list the R&R number.
- C. Incorrect: Do not NA any blocks. Plausible because the valve will not be in the listed position.
- D. Incorrect: Per SOMP 4-2, Review the impact of the out of position valve, list the R&R number on the checklist and initial. Plausible because the valve will not be in the listed position.

---

Technical Reference(s): **SOMP 4-2 Rev 1**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **ADM-OMP**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**GL OK**

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**1 POINT**

**Question 70**

Unit 1 plant conditions:

- MODE 3
- SR 3.1.1.1 (Verify SDM is within the limit specified in the COLR) has a 24 hour frequency
- SR 3.1.1.1 was last performed at 1000 on 8/12

Based on the above conditions and applying any extensions allowed, which ONE of the following indicates the latest time that SR 3.1.1.1 must be performed before it is classified as a missed surveillance?

- A. 8/13 @ 1000
- B. 8/13 @ 1600
- C. 8/13 @ 1900
- D. 8/14 @ 1600

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Question 70

**T3 - gcw**

G2.2.12

**Knowledge of surveillance procedures. (3.7/4.1)**

**K/A MATCH ANALYSIS**

Question requires knowledge of surveillance frequency.

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect, plausible because 24 hours is the surveillance frequency.
- B. Correct, S.R. 3.0.2 allows 1.25 times the frequency. 1000 on 8/12 + 30 hours = 1600 on 8/13.**
- C. Incorrect, plausible because this time would be end of the day shift and when PT/600/001 would be complete.
- D. Incorrect, this misapplies SR 3.0.3.

---

Technical Reference(s): **TS SR 3.0.2**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **ADM-ITS Obj R5**

Question Source: **Bank ITS058**

Question History: Last NRC Exam:

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**Modified stem to ensure only one correct answer.**

**GL OK**

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**1 POINT**

**Question 71**

A NEO is to valve out the Unit 1A Seal Supply filter.

Based on the RWP and the Plan View, which ONE of the following describes the maximum time (minutes) he can take to perform this task before he must exit the area?

**SEE ATTACHMENT**

- A. 33
- B. 60
- C. 166
- D. 300

Question 71

**T3**

G2.3.7

**Ability to comply with radiation work permit requirements during normal or abnormal conditions. (3.5/3.6)**

**K/A MATCH ANALYSIS**

Requires knowledge of radiation work permits locations.

**ANSWER CHOICE ANALYSIS**

**Answer: A**

**A. Correct: using correct dose rate and dose alarm setpoint.**

B. Incorrect: correct if you use 10 mr/hr for dose rate.

C. Incorrect: correct if you use 50 mr for dose alarm.

D. Incorrect: correct if you use 10 mr/hr for dose rate and 50 mr for dose alarm..

---

Technical Reference(s): **RAD-RPP Rev 7c**

Proposed references to be provided to applicants during examination: **Rm 208 Plan View; RWP 23**

Learning Objective: **RAD-RPP Obj R24**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

***Wrote new question to match KA. Changed Q to a C/A. Look at 80% of dose limit to leave. >> Modified to remove dose alarm from stem.***

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**1 POINT**

**Question 72**

Plant conditions:

- Refueling of Unit 3 is complete
- The Reactor Vessel Head is installed
- RCS temperature is being maintained at 150 °F
- An NEO must enter the Reactor Annulus

Which ONE of the choices fills in the blanks of the following statement?

Access to the Reactor Annulus is controlled by \_\_\_\_\_. The in-core wires must be \_\_\_\_\_ before entry is permitted, and \_\_\_\_\_ RP coverage is required for entry.

- A. RP Supervisor / Manager; “parked”; periodic
- B. RP Supervisor / Manager; fully inserted into the reactor core; continuous
- C. Operations Shift Manager; “parked”; continuous
- D. Operations Shift Manager; fully inserted into the reactor core; periodic

Question 72

**T3 - ja**

G2.3.14

**Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities. (3.4/3.8)**

**K/A MATCH ANALYSIS**

The in-core wires present a significant exposure hazard if operated or in the wrong location when access is made. The question tests knowledge of the associated precautions and responsibility.

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect. The first part and second part are correct. Third part requires continuous coverage.
- B. Correct. RP Supervision is responsible for checking the conditions, approving access and issuing keys for this area.**
- C. Incorrect. The Shift Supervisor can issue keys for some RadPro-related areas but not this one.
- D. Incorrect. The second part is correct.

---

Technical Reference(s):

- **Lesson Plan RAD-RPP, Pg. 34, M.3-6 Rev 7c**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **RAD-RPP Obj R8**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**GL OK - Reworded answers to eliminate confusion. Added Manager to A and B.**  
**GL OK**

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**1 POINT**

**Question 73**

Unit 3 plant conditions:

- Reactor power = 100%
- 3A and 3B RCW pumps tripped

Based on above conditions, which ONE of the following states the procedure that should be entered?

- A. EP/3/A/1800/001 (Emergency Operating Procedure)
- B. AP/3/A/1700/22 (Loss of Instrument Air)
- C. AP/3/A/1700/29 (Rapid Unit Shutdown)
- D. AP/3/A/1700/35 (Loss of SFP Cooling and/or Level)

Question 73

**T3**

G2.4.4

**Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.**  
(4.5/4.7)

**K/A MATCH ANALYSIS**

Requires knowledge of entry conditions for various APs.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect, plausible because if Unit 1&2 RCW was lost all three turbines would be tripped due to loss of cooling to the alterx.
- B. Incorrect, IA would not be affected because HPSW cools the primary IA compressor. RCW does cool the Backup IA compressors.
- C. Incorrect, Unit 3's RCW does not provide cooling to any secondary loads. Plausible because high temp alarm on the exiter would required a rapid unit shutdown.
- D. Correct, Unit 3's RCW provides cooling to Unit 3's SFP. Temperatures would increase meeting the entry conditions for AP/35.**

---

Technical Reference(s): **AP/35 (Loss of SFP Cooling and/or Level)**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-APG Obj R9**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

***Wrote new question to match KA. GL OK***

**1 POINT**

**Question 74**

Unit 1 initial conditions:

- Reactor power = 100%

Current conditions:

- Switchyard isolation due to low switchyard voltage
- CT1 lockout

Based on the above conditions, which ONE of the following states what will initiate the trip and which operator will be directed to perform AP/25 (Standby Shutdown Facility Emergency Operating Procedure)?

- A. Loss of MFWDs / BOP
- B. Loss of MFWDs / OATC
- C. High RCS Press / BOP
- D. High RCS Press / OATC

Question 74

**T3 - kds**

G2.4.13

**Knowledge of crew roles and responsibilities during EOP usage. (4.0/4.6)**

**K/A MATCH ANALYSIS**

Question requires knowledge of crew responsibilities during EOP usage.

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect, the RCS will trip on High RCS pressure due to the turbine runback. Plausible because the MFWPs will trip (which is a reactor trip) but its after the reactor trip. Second part is correct.
- B. Incorrect, the RCS will trip on High RCS pressure due to the turbine runback. Plausible because the MFWPs will trip (which is a reactor trip) but its after the reactor trip. Second part is plausible because the OATC is the operator that has "Initiate AP/25" in their procedure.
- C. Correct, the RCS will trip on High RCS pressure due to the turbine runback. After the trip, power will be lost to HPIPs and CC pumps for ~ 30 seconds. As the OATC is performing IMAs, he will direct the SRO to initiate AP/25 to provide SSF Reactor Coolant Makeup. Since the OATC has to complete the IMAs, the BOP is the one directed to perform AP/25.**
- D. Incorrect, the OATC has to complete the IMAs. Plausible because the OATC is the operator that has "Initiate AP/25" in their procedure.

---

Technical Reference(s): **EAP-IMA, EOP Rev 36**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-IMA Obj R6**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge  
Comprehension or Analysis**

**GL OK**

**1 POINT**

**Question 75**

Unit 1 plant conditions:

- Reactor power = 100%
- 1RIA-40, CSAE Off-Gas Monitor, reading is rising slowly
- 1RIA-54, Turbine Building (TB) Sump Monitor, is inoperable
- The operating crew has just entered AP/31, PRIMARY TO SECONDARY LEAKAGE

Based on the above conditions, which ONE of the following describes who must be notified and a required action?

The operating crew must notify \_\_\_\_\_ to sample the TB sump and direct an NEO to \_\_\_\_\_.

- A. Secondary Chemistry / open and white tag the TB Sump Pump breakers.
- B. Secondary Chemistry / align the TB Sump to the TB Sump Monitor Tanks.
- C. Radiation Protection / open and white tag the TB Sump Pump breakers.
- D. Radiation Protection / align the TB Sump to the TB Sump Monitor Tanks.

Question 75

**T3**

G2.4.30

**Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator. (2.7/4.1)**

**K/A MATCH ANALYSIS**

Aware of the RIA System status and IAAT statement upon implementation of the abnormal procedure. Secondary Chemistry (internal organization) must be notified to draw a TBS sample and recommend an alignment.

**ANSWER CHOICE ANALYSIS**

**Answer: A**

- A. Correct. Proper department and the task is performed if RIA-54 is in HIGH Alarm or inoperable.**
- B. Incorrect. Correct department but only done if RIA-54 is in HIGH Alarm in AP/1/A/1700/018.
- C. Incorrect. Correct task, wrong department. Plausible because RP is notified to perform other tasks in the AP.
- D. Incorrect. Wrong department. Task is performed if RIA-54 is in HIGH Alarm in AP/1/A/1700/018.

---

Technical Reference(s): **AP/31, Pg. 3, Steps 4.2-4.4 Rev 14**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-APG Obj R9**

Question Source: **New**

Question History: Last NRC Exam:

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**GL OK --- Added "direct an NEO" to stem for clarity. GL OK**

**1 POINT**

**Question 76**

Unit 1 initial conditions:

- Reactor trip
- RCS pressure = 1800 psig decreasing
- PZR level = 280 inches increasing
- 1B HPI pump trip

Current conditions:

- LOSCM tab in progress
- 1RC-4 closed
- RCS pressure = 825 psig increasing
- PZR level = 400 inches stable
- ALL SCMs = 4°F increasing
- RC makeup flow = 10 gpm

Based on the current conditions, which ONE of the following states an acceptable SG pressure per the LOSCM tab and which EOP tab will be used to cool down the unit to decay heat removal conditions?

- A. 1010 psig / LOCA CD
- B. 1010 psig / FCD
- C. 780 psig / LOCA CD
- D. 780 psig / FCD

Question 76

**T1/G1**

008AA2.24 Pressurizer Vapor Space Accident / 3

**Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident:** Value at which turbine bypass valve maintains header pressure after a reactor trip (2.6/2.6\*)

**K/A MATCH ANALYSIS**

Requires knowledge of plant response to a Pzr vapor space event and the LOSCM procedure as far as maintaining SG pressure.

**SRO-ONLY ANALYSIS**

Requires knowledge of EOP procedure strategy and transition criteria.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect: Per the LOSCM tab, maintain SG pressure < RCS pressure. Plausible because TBV setpoint will be 1010 psig after a reactor trip. Transition to LOCA CD would be correct if HPI makeup flow was > normal makeup capability.
- B. Incorrect: Per the LOSCM tab, maintain SG pressure < RCS pressure. Plausible because TBV setpoint will be 1010 psig after a reactor trip. Second part is correct.
- C. Incorrect: first part is correct. Second part is incorrect. Transition will be made to the FCD tab. Plausible because a stuck open PORV is essentially a SBLOCA.
- D. Correct: Per the LOSCM tab, maintain SG pressure < RCS pressure. Transition will be made to the FCD tab because RCPs are secured and HPI makeup < normal makeup capability.**

---

Technical Reference(s): **EOP LOSCM Tab Rev. 36**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-LOSCM R12**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

***The RCS is solid. The leak through the PORV has been isolated by closing 1RC-4.***  
GL OK

**1 POINT**

**Question 77**

Unit 1 initial conditions:

- Reactor power = 100%
- 1SA2/B2 HP RCP SEAL INLET HEADER FLOW HIGH/LOW actuated
  - 0 GPM stable
- 1SA2/C2 HP INJECTION PUMP DISCH HEADER PRESSURE LOW actuated
  - $\approx$  0 psig stable
- 1SA2/C3 RC PRESSURIZER LEVEL HI/LO actuated
  - 199 inches decreasing slowly
- Highest RCP seal return temperature = 175 °F stable
- RC Makeup Flow = 0 gpm

Based on the above conditions, which ONE of the following describes the current plant condition and what action will be required to mitigate this condition?

- A. HPI Seal Injection header rupture / enter AP/2 (Excessive RCS Leakage) and close 1HP-31 to prevent RCP Seal damage
- B. Loss of running and Stby HPIPs / enter AP/14 (Loss of Normal HPI Makeup and/or RCP Seal Injection) and close 1HP-20/21 to prevent exceeding 1HP-21 temperature limit
- C. HPI injection header A rupture / enter AP/2 (Excessive RCS Leakage) and close 1HP-115 to split the injection headers
- D. Loss of running and Stby HPIPs / enter AP/14 (Loss of Normal HPI Makeup and/or RCP Seal Injection) close 1HP-5 to minimize RCS inventory loss

Question 77

**T1/G1**

022G2.4.45 Loss of Rx Coolant Makeup / 2

**Ability to prioritize and interpret the significance of each annunciator or alarm.**  
(4.1/4.3)

**K/A MATCH ANALYSIS**

Requires ability to interpret annunciators to determine plant conditions and knowledge of alarm response guides to take actions.

**SRO-ONLY ANALYSIS**

Requires analysis and interpretation of conditions and multiple alarms, and based on the diagnosis select the correct procedure and action (43.5)

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect, for a rupture in the HPI Seal Injection header, RC MAKEUP FLOW will be unaffected and Discharge Header pressure would not be Low the other indications provided would be consistent with an RCS Inventory Loss/Leak. Procedure selected is plausible as it is consistent with diagnosis in first part and action taken is reasonable as it would provide potential isolation of the leak and protect the RCP seals.
- B. Incorrect, first part is correct. Procedure selected and action taken is consistent with diagnosis and is the correct procedure for the actual event. Second part incorrect. Plausible because if CC flow is also lost Seal Return temperature would increase. Per #4 in AP/14 appendix "*PIP 02-2529, 02-2423: 1HP-21 maximum valve seat temperature is 250°F. If any seal return temperature exceeds 250°F, the penetration must be isolated or declared inoperable.*"
- C. Incorrect, for a rupture in the HPI Injection header, RC MAKEUP FLOW will be high, not '0'. The other indications provided would be consistent with an RCS Inventory Loss/Leak. Procedure selected is plausible as a leak diagnosis has been made in first part. The action taken is consistent with direction in AP-14 for the event diagnosed in this distracter.
- D. Correct, indications are consistent with no HPIPs running. AP/14 (Loss of Makeup/Seal Injection) is the correct procedure and action is correct for conditions given.**

---

Technical Reference(s): **ARG 1SA2 -B2, C2, C3, D3 Rev 21, AP/2 (Excessive RCS Leakage) Rev 11 & AP/14 (Loss of Normal HPI Makeup and/or RCP Seal Injection) Rev 15**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-APG Obj R9**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: **Memory or Fundamental Knowledge  
Comprehension or Analysis**

**GL OK- HPIP discharge press not on the OAC. Left at zero on question.**

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1 POINT

Question 78

Unit 1 initial conditions:

- 1B SG has a 50 gpm tube rupture
- SGTR tab in progress
- Reactor has been manually tripped at 4% FP

Current conditions:

- 1A SG pressure = 0 psig stable
- 1B SG pressure = 900 psig and increasing slowly
- RCS temperature = 532 °F increasing slowly
- RCS pressure = 1280 psig increasing slowly

Based on the current conditions, which ONE of the following describes how the EOP will be used to mitigate the event?

- A. Remain in SGTR tab  
Unisolate and feed 1A SG
- B. Remain in SGTR tab  
Feed and steam the 1B SG
- C. Transfer to Excessive Heat Transfer tab  
Unisolate and feed 1A SG
- D. Transfer to Excessive Heat Transfer tab  
Feed and steam the 1B SG

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Question 78

**T1/G1**

BW/E05EA2.1 Steam Line Rupture - Excessive Heat Transfer / 4

**Ability to determine and interpret the following as they apply to the (Excessive Heat Transfer):** Facility conditions and selection of appropriate procedures during abnormal and emergency operations. (3.2/4.4)

**K/A MATCH ANALYSIS**

Question requires determination of plant conditions post trip that will require selection of the EHT EOP

**SRO-ONLY ANALYSIS**

10CFR55.43(b) item 5 is met because the SRO must determine plant conditions during the EOPs, and choose the correct procedure guidance for mitigation.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect, first part is incorrect. Plausible because for some events you stay in SGTR tab. Second part is incorrect. Plausible because you would be feeding the SG without the SG tube leak.
- B. Incorrect, first part is incorrect. Plausible because for some events you stay in SGTR tab. Second part is correct.
- C. Incorrect, first part is correct. Second part is incorrect. Plausible because you would be feeding the SG without the SG tube leak.
- D. Correct, the Parallel Action page transfer to EHT will occur. In the EHT tab direction will be given to feed and steam the SG with an intact secondary pressure boundary.**

---

Technical Reference(s): **EOP IMA's and EHT tab Rev 36**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-EHT (R3)**

Question Source: **New**

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

GL OK

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**1 POINT**

**Question 79**

Which ONE of the following describes the basis for the mitigation strategy of the Blackout tab of the EOP and why?

- A. Maintain RCS temperature ~ 532°F  
To stabilize RCS Temperature and pressure to prevent challenging the Pressurizer PORV
- B. Maintain RCS temperature ~ 532°F  
To prevent contracting RCS inventory and emptying the Pressurizer due to loss of makeup capacity
- C. Maintain RCS temperature at ~ 550°F  
To stabilize RCS Temperature and pressure to prevent challenging the Pressurizer PORV
- D. Maintain RCS temperature at ~ 550°F  
To prevent contracting RCS inventory and emptying the Pressurizer due to loss of makeup capacity

Question 79

**T1/G1 - jmb**

055G2.4.18 Station Blackout / 6

**Knowledge of the specific bases for EOPs. (3.3/4.0)**

**K/A MATCH ANALYSIS**

Question requires knowledge of the basis for the Blackout tab of the EOP.

**SRO-ONLY ANALYSIS**

Question requires knowledge of the basis for the Blackout tab of the EOP which SRO knowledge.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect, first part is incorrect. Plausible because 532°F is normal zero power Tave. Second part is incorrect. Plausible as the bases does discuss potential for challenge to the PZR Safety Valve
- B. Incorrect, First part is as described in distracter A. Second part is correct. The objective of the mitigation strategy is to stabilize plant conditions at hot shutdown (550°F) while efforts to restore an AC power source continue. The SSF can power pressurizer heaters to maintain pressure control. Cooling down below 550°F cannot be undertaken as in a normal plant cooldown due to inadequate RCS makeup flow capacity.
- C. Incorrect, the Blackout tab will stabilize RCS temperature at ~ 550°F and the Second part is incorrect. Plausible as the bases does discuss potential for challenge to the PZR Safety Valve
- D. **Correct, the objective of the mitigation strategy is to stabilize plant conditions at hot shutdown (550°F) while efforts to restore an AC power source continue. The SSF can power pressurizer heaters to maintain pressure control. Cooling down below 550°F cannot be undertaken as in a normal plant cooldown due to inadequate RCS makeup flow capacity.**

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Technical Reference(s): **EOP Reference Document, EAP-BO Rev. 36**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-BO R2**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

GL OK

1 POINT

Question 80

Unit 1 plant conditions:

Time = 0400

- Reactor power = 100%
- AP/2 (Excessive RCS Leakage) in progress due to a 15 gpm RCS leak
- Switchyard Isolation
- CT-1, 1TA & 1TB Lockout

Time = 0401

- Power restored from CT-4

Time = 0410

- FCD tab in progress
- CETC = 555 °F Stable
- Loop A level = 573 inches stable
- Loop B level = 573 inches stable
- Rx Vessel head level = 155 inches decreasing
- Pressurizer level = 180 inches increasing
- RC Make Up Flow = 30 gpm

Which ONE of the following describes how the EOP will initially mitigate the event above and the highest priority AP that will be performed in parallel with the EOP?

- A. Open Rx Vessel High Point Vents and maintain pressurizer level > 100 inches  
AP/2 (Excessive RCS Leakage)
- B. Raise pressurizer level to 200 - 300 inches and increase RCS pressure  $\geq$  200 psig  
AP/2 (Excessive RCS Leakage)
- C. Open Rx Vessel High Point Vents and maintain pressurizer level > 100 inches  
AP/11 (Recovery from Loss of Power)
- D. Raise pressurizer level to 200 - 300 inches and increase RCS pressure  $\geq$  200 psig  
AP/11 (Recovery from Loss of Power)

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Question 80

**T1/G1**

056AA2.48 Loss of Off-site Power / 6

**Ability to determine and interpret the following as they apply to the Loss of Offsite Power:** Reactor coolant temperature, pressure, and PZR level following a power outage transient (4.3/4.4)

**K/A MATCH ANALYSIS**

KA is matched because a loss of off-site power with additional complications has occurred. The applicant is required to determine requirements for pressurizer level for the given plant conditions.

**SRO-ONLY ANALYSIS**

10CFR55.43(b) item 5 is met because the SRO must assess the extent of loss of power and determine how PZR level will be maintained and why and correctly prioritize which AP will be addressed concurrently with the EOP.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect, first part is incorrect but is plausible as Rx Vessel High Point Vents would be used if pressurization does not succeed in collapsing the head void. Second part incorrect but plausible because AP/2 was in use prior to the reactor trip and could be completed when the EOP is exited.
- B. Incorrect, first part is correct. Second part incorrect but plausible because AP/2 was in use prior to the reactor trip and could be completed when the EOP is exited.
- C. Incorrect, first part is incorrect but is plausible as Rx Vessel High Point Vents would be used if pressurization does not succeed in collapsing the head void. Second part is correct.
- D. Correct, per the FCD tab pressurizer Level is raised to 200 - 300 to prevent loss of pressure control when level drops during subsequent pressure increase to collapse the hot leg void. AP/11 directed to be implemented concurrently with the EOP to restore secondary systems.**

---

Technical Reference(s): **EOP SA & FCD Tab Rev 36**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-FCD R1, 7**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

***Rewrote stem to clarify time line and remove EOP tab selection and added AP prioritization. GL OK -- Reworded stem and answers to provide clarity.***

**1 POINT**

**Question 81**

Unit 1 initial conditions:

- Reactor power = 100%

Current conditions:

- 1HP-5 indicating lights (UB1) are OFF
- Pressurizer Level = 230 inches increasing
- Letdown Flow = 0 gpm
- 1HP-5 will NOT open from the control room
- NEO dispatched to open 1HP-5 locally

Based on the above conditions, which ONE of the following describes what has occurred and whether 1HP-5 is operable after it is manually opened?

- A. 1HP-5 has failed closed due to a loss of DC power to the valve solenoid  
1HP-5 is operable provided an operator in constant communication with the control room will close the valve on ES actuation.
- B. 1HP-5 has failed closed due to a loss of DC power to the valve solenoid  
1HP-5 is inoperable because it will not automatically close on a subsequent ES actuation.
- C. 1HP-5 has closed due to an inadvertent ES Signal to the valve  
1HP-5 is operable provided an operator in constant communication with the control room will close the valve on ES actuation.
- D. 1HP-5 has closed due to an inadvertent ES Signal to the valve  
1HP-5 is inoperable because it will not automatically close on a subsequent ES actuation.



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1 POINT

Question 82

Unit 1 initial plant conditions:

- Rx startup in progress
- Source Range (SR) NIs 1 and 3 are out of service for repairs
- Reactor is critical
- WR NI-2 = 1.0 E-2%
- WR NI-4 = 1.0 E-2%
- SR NI-2 = 1.0 E5 cps
- SR NI-4 = 1.0 E5 cps

Subsequently, SR NI-2 fails LOW

Which ONE of the following describes the technical specification required action and the surveillance requirement for returning NI-2 to service?

- A. Initiate action to restore SR NI -2 to operable status within 1 hour.  
NI-2 must agree with NI-4 within 1 decade
- B. Initiate action to restore SR NI -2 to operable status within 1 hour.  
NI-2 must agree with NI-4 within 2 decades
- C. Immediately suspend positive reactivity changes and initiate control rod insertion.  
Open control rod drive trip breakers within 1 hour.  
NI-2 must agree with NI-4 within 1 decade
- D. Immediately suspend positive reactivity changes and initiate control rod insertion.  
Open control rod drive trip breakers within 1 hour.  
NI-2 must agree with NI-4 within 2 decades

Question 82

**T1/G2**

032G2.2.42 Loss of Source Range NI / 7

**Ability to recognize system parameters that are entry-level conditions for Technical Specifications. (3.9/4.6)**

**K/A MATCH ANALYSIS**

KA is met because the applicant is required to determine whether entry to TS are met for loss of SR indication. Choices iterate between entry and no entry, with plausible reasons.

**SRO-ONLY ANALYSIS**

10CFR55.43(b) item 2 is met because the SRO must determine whether TS action is required in a condition where a transient power change is in progress.

**ANSWER CHOICE ANALYSIS**

**Answer: A**

- A. Correct, TS 3.3.9, action C requires restoration within 1 hour. SR 3.3.9.1 requires two SR NI indications to agree within 1 decade.**
- B. Incorrect, first part is correct. Second part is incorrect. Two decades is plausible because this is typical overlap between SR and WR NIs.
- C. Incorrect, first part is incorrect. Second part is incorrect. Two decades is plausible because this is typical overlap between SR and WR NIs.
- D. Incorrect, both parts are incorrect. Plausible as this action would be required if power level was less than  $4 \times 10^{-4}$  on WR indication and no SR NI's are operable. Second part is incorrect. Two decades is plausible because this is typical overlap between SR and WR NIs.

---

Technical Reference(s): **TS 3.3.9; PT/600/001**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **ADM-TSS R1, R5**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

***Wrote new question at the SRO level. >>>Reworded question for clarification. GL OK --- Removed "operation may continue" from A and B to match the stem. Underlined "required". GL OK***

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1 POINT

Question 83

Unit 1 initial conditions:

- Fire occurred at the Unit 1 TD EFDW pump area
- Deluge system activated

Current conditions:

- Fire extinguished
- Deluge system isolated
- ALL fire detection equipment in area is inoperable

Based on the above conditions, which ONE of the following states SLC 16.9.2 "Sprinkler and Spray System" requirements regarding the establishment of a fire watch?

- A. Establish a Continuous Fire Watch within one hour  
Backup fire suppression is required
- B. Establish a Continuous Fire Watch within one hour  
Backup fire suppression is NOT required once fire watch is established
- C. Establish a Hourly Fire Watch within one hour  
Backup fire suppression is required
- D. Establish a Hourly Fire Watch within one hour  
Backup fire suppression is NOT required once fire watch is established

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Question 83

**T1/G2**

067AA2.15 Plant Fire On-site / 8

**Ability to determine and interpret the following as they apply to the Plant Fire on Site: Requirements for establishing a fire watch (2.9/3.9)**

**K/A MATCH ANALYSIS**

Requires knowledge of the requirements for establishing a fire watch.

**SRO-ONLY ANALYSIS**

SRO requires knowledge of fire watch requirements per NSD 316 and SLC 16.9.2 for impairment of fire suppression equipment.

**ANSWER CHOICE ANALYSIS**

**Answer: A**

- A. Correct: Per SLC 16.9.2 for one or more required Sprinkler or Spray System inoperable and no fire detection, establish a continuous fire watch with backup fire suppression equipment in the area within one hour.**
- B. Incorrect: First part is correct. Fire suppression equipment is required.
- C. Incorrect: First part is incorrect. Hourly fire watch would be required if there was operable detection in the room. Second part is correct.
- D. Incorrect: First part is incorrect. Hourly fire watch would be required if there was operable detection in the room. Fire suppression equipment is required.

---

Technical Reference(s): **SLC 16.9.2 (Sprinkler and Spray Systems)**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **ADM-TSS Obj R4**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**Modified answers to ensure only one correct answer.**

GL OK

**1 POINT**

**Question 84**

Unit 1 initial conditions:

- Reactor power = 100%

Current conditions:

- Main Turbine tripped
- TBVs failed closed
- All ICS Bailey Hand/Auto Stations lights are OFF

Based on the above conditions, which ONE of the following describes which section of AP/23 (Loss of ICS Power) will be implemented and when that section will be performed?

- A. Section 4A (Loss of ICS AUTO and HAND Power)  
When EOP Subsequent Actions have been completed and transition to a normal operating procedure is directed
- B. Section 4A (Loss of ICS AUTO and HAND Power)  
Immediately following performance of the EOP IMA's and Symptom Checks OR when directed by EOP Subsequent Actions
- C. Section 4B (Loss of ICS AUTO Power Only)  
When EOP Subsequent Actions have been completed and transition to a normal operating procedure is directed
- D. Section 4B (Loss of ICS AUTO Power Only)  
Immediately following performance of the EOP EOP IMA's and Symptom Checks OR when directed by EOP Subsequent Actions

Question 84

**T1/G2 jmb**

BW/A04G2.4.8 Turbine Trip / 4

**Knowledge of how abnormal operating procedures are used in conjunction with EOPs. (3.8/4.2)**

**K/A MATCH ANALYSIS**

There is no specific EOP entry for only a turbine trip. Loss of ICS power results in a turbine trip so a turbine-reactor trip was used. Question addresses AP implementation with the EOP in progress.

**SRO-ONLY ANALYSIS**

Implementation of AP's in conjunction with EOP's is an SRO decision. In this case the applicant should have recall knowledge that this is one of the few directed AP initiations with the EOP in progress.

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect, first part is correct. Second part is plausible because other APs not specifically directed by the EOP would be performed when the EOP was completed.
- B. Correct, EOP is entered upon Rx Trip then AP/23 is initiated when directed by the EOP. The SRO can also decide to initiate the AP when IMAs and the Symptom Check are complete. Indications given are consistent with a loss of both ICS Auto & Hand power.**
- C. Incorrect, first part is incorrect. Indications given are consistent with a loss of both ICS Auto & Hand power. Second part is plausible because other APs not specifically directed by the EOP would be performed when the EOP was completed.
- D. Incorrect, first part is incorrect. Indications given are consistent with a loss of both ICS Auto & Hand power. Second part is correct.

---

Technical Reference(s): **OMP-1-18 Implementation Standard During Abnormal and Emergency Events, 5.2.1, Pg. 10 Rev 25  
EOP Subsequent Actions Rev 36**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-SA Obj R11**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

***Rewrote answer analysis. The SRO determines which section of the AP to perform and when the AP will be implemented. ... removed 4<sup>th</sup> bullet. GL OK***

**1 POINT**

**Question 85**

Unit 1 initial conditions:

- 1A SG has a SGTR
- 1B SG is unaffected
- Core SCM = 0°F
- LOSCM tab completed

Current conditions:

- SGTR tab in progress
- Core SCM = 0°F
- LPI Flow Train A = 1750 gpm
- LPI Flow Train B = 1725 gpm

Which ONE of the following describes the procedure routing used to mitigate this event and the SG status?

- A. Transition to HPI CD Tab and ONLY 1A SG is isolated
- B. Transition to LOCA CD Tab and ONLY 1A SG is isolated
- C. Transition to HPI CD Tab and BOTH SG's are isolated
- D. Transition to LOCA CD Tab and BOTH SG's are isolated

Question 85

**T1/G2**

BW/E08EA2.2 LOCA Cooldown - Depress. / 4

**Ability to determine and interpret the following as they apply to the (LOCA Cooldown):** Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments. (3.6/4.0)

**K/A MATCH ANALYSIS**

For LOCA CD, this item matches KA because it requires knowledge of actions performed for a condition specific to the event, which is a SGTR which results in a LOSCM and LPI flow.

**SRO-ONLY ANALYSIS**

10CFR55.43(b) item 5 is met because the SRO must assess the conditions given, and select the appropriate procedure action from amongst 4 plausible options.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect: Transition to HPI CD Tab is plausible as it is directed as the alternate path in the decision step which directs transition to LOCA CD Tab. SG status is plausible as only the affected SG is isolated if LPI Flow is not adequate to remove decay heat (<3400 gpm)
- B. Incorrect: LOCA CD Tab is appropriate however since LPI Flow is adequate to remove decay heat the SG's are both isolated. If LPI flow is < 3400 gpm then only the affected SG is isolated.
- C. Incorrect: Transition to HPI CD Tab is plausible as it is directed as the alternate path in the decision step which directs transition to LOCA CD Tab. SG Status is correct.
- D. Correct: Transition to the LOCA Tab is directed from SGTR Tab if SCM is not adequate and HPI Forced Cooling is not in progress. LOCA CD Tab will isolate both SG's if LPI Flow is adequate to remove decay heat (≥3400 gpm)**

---

Technical Reference(s): **SGTR Step 62 & LOCA CD Step 16 Rev 36**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-SGTR Obj R17**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**GL OK**

**1 POINT**

**Question 86**

Unit 1 plant conditions:

- RCS temperature = 240°F
- RCS pressure = 260 psig
- No RCS Vent Paths are open
- HPI has been deactivated
- 1A and 1B CFT pressure = 500 psig
- 1CF-1 and 1CF-2 Closed and Bkrs WT Opened
- Pressurizer level indicates 235 inches
- Cooldown to Mode 5 in progress at 20°F/Hr

Which ONE of the following describes the impact of this condition, and the action required?

**SEE ATTACHMENT**

- A. RCS pressure and temperature exceed the limits that ensure brittle fracture prevention in accordance with TS 3.4.3 RCS Pressure and Temperature (PT) Limits; Establish an RCS Vent Path or dedicated LTOP Operator.
- B. RCS pressure and temperature exceed the limits that ensure brittle fracture prevention in accordance with TS 3.4.3 RCS Pressure and Temperature (PT) Limits; Restore RCS Pressure and Temperature to within limits in 30 minutes or less
- C. Administrative controls (Train 2) for an LTOP event are lost; Establish an RCS Vent Path or dedicated LTOP Operator in accordance with TS 3.4.12 Low Temperature Over Pressure Protection.
- D. Administrative controls (Train 2) for an LTOP event are lost; Depressurize CFTs to less than RCS pressure within 1 hour in accordance with TS 3.4.12 Low Temperature Over Pressure Protection.

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Question 86

**T2/G1**

005A2.02 Residual Heat Removal

**Ability to (a) predict the impacts of the following malfunctions or operations on the RHRS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Pressure transient protection during cold shutdown (3.5/3.7)**

**K/A MATCH ANALYSIS**

KA is matched because impact is brittle fracture prevention is lost, and action in accordance with TS and in accordance with OP/1/A/1104/049 are the same.

**SRO-ONLY ANALYSIS**

10CFR55.43(b) item 2 is met because the SRO must interpret conditions that require actions in accordance with technical specifications

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect, P/T limits are satisfied in accordance with enclosure 3.31 of OP/0/A/1108/001. Correct action for actual condition
- B. Incorrect, P/T limits are satisfied in accordance with enclosure 3.31 of OP/0/A/1108/001
- C. Correct, PZR level is too high for the conditions of RCS temperature and pressure. Compensatory actions must be taken or vent path made available**
- D. Incorrect, depressurization of CFTs would be required if not isolated by CF-1/2.

---

Technical Reference(s): **TS 3.4.12 and basis**  
**OP/0/A/1108/001 Rev 72**  
**OP/1/A/1104/049 Rev 39**

Proposed references to be provided to applicants during examination:  
**OP/0/A/1108/001, Enclosure 3.31, pages 2-5**

Learning Objective: **CP-017 Obj R10**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: **Memory or Fundamental Knowledge**  
**Comprehension or Analysis**

GL OK – Discuss handout – Rewrite “D”.

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1 POINT

Question 87

Unit 1 initial conditions:

- Unit startup and heatup in progress
- OP/1102/001 Controlling procedure for Unit Startup in progress

Based on the above conditions, choose the response below that answers the following questions:

- a) Which ONE of the following describes the RCS pressure band at which the Core Flood tanks are placed in service per OP/1104/001 (Core Flood Tank Operation)?
  - A. 730 - 750 psig  
At a reduced pressure, safety injection pumps can provide sufficient flow to prevent exceeding cladding temperature limits during a Large Break LOCA.
  - B. 780 - 800 psig  
At a reduced pressure, safety injection pumps can provide sufficient flow to prevent exceeding cladding temperature limits during a Large Break LOCA.
  - C. 730 - 750 psig  
At a reduced pressure safety injection pumps can provide sufficient flow to ensure the core remains completely covered during a Large Break LOCA.
  - D. 780 - 800 psig  
At a reduced pressure safety injection pumps can provide sufficient flow to ensure the core remains completely covered during a Large Break LOCA.

Question 87

**T2/G1**

006G2.1.23 Emergency Core Cooling

**Ability to perform specific system and integrated plant procedures during all modes of plant operation. (4.3/4.4)**

**K/A MATCH ANALYSIS**

KA is met because the applicant is required to determine operation of the system during an emergency

**SRO-ONLY ANALYSIS**

10CFR55.43(b) item 5 is met because the SRO must assess conditions and equipment availability and determine the appropriate course of action, including strategy

**ANSWER CHOICE ANALYSIS**

**Answer: A**

- A. Correct: Per TS Bases 3.5.1, At or below 800 psig, the rate of RCS blow down is such that the safety injection pumps can provide adequate injection to ensure that peak clad temperature remains below the 10.CFR 50.46 limit of 2200 degrees.**
- B. Incorrect: Pressure is 730 to 750 psig. Plausible because TS requirement is 800 psig.
- C. Incorrect: Safety Injection will not prevent core uncover. Plausible because at low pressure SI flow will increase.
- D. Incorrect: Pressure is 730 to 750 psig. Plausible because TS requirement is 800 psig.

---

Technical Reference(s): **OP/1102/001 Rev 270,**  
**OP/1104/001 Rev 62**  
**TS Bases B3.5.1**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **PNS CF Obj R1**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**Removed maximum from A and B for clarification. Modified stem and second part of C and D to ensure only one correct answer. >>> Restore old C and D. - Done ---- Reworded C and D for clarification. GL OK**

**1 POINT**

**Question 88**

Unit 1 plant conditions:

- Reactor power = 100%
- 'A' RPS Variable Low RCS Pressure Trip Bistable trips
- The crew determines that the bistable has failed
- The bistable output state cannot be reset by the crew
- SPOC has been contacted to investigate
- While performing action for the failed channel, the RO inadvertently places the 'B' RPS Channel to MANUAL BYPASS

Based on the above conditions, which ONE of the following correctly describes the effect on the unit when the "B" RPS channel is placed in MANUAL BYPASS and the operability of the RPS Variable Low RCS Pressure Trip function(s) at this time?

**ASSUME NO OPERATOR ACTION**

- A. The reactor trips  
'A' RPS Variable Low RCS Pressure Trip function is no longer required to be operable
- B. The reactor trips  
'A' RPS Variable Low RCS Pressure Trip function is operable
- C. The reactor remains at power  
RPS Variable Low RCS Pressure Trip function is operable
- D. The reactor remains at power  
RPS Variable Low RCS Pressure Trip function is NOT operable

Question 88

**T2/G1**

012A2.03 Reactor Protection

**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:** Incorrect channel bypassing (3.4/3.7)

**K/A MATCH ANALYSIS**

KA is matched because incorrect channel bypassing for an RPS channel redundant to a failed channel requires action in accordance with technical specifications. Additionally, impact is described in the options

**SRO-ONLY ANALYSIS**

10CFR55.43(b) item 2 is met because the SRO must know and be able to apply technical specification actions based on consequences for RPS instrumentation.

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect, first part is incorrect. Plausible because it placed in shutdown bypass the reactor would trip. Second part is incorrect. The function is inoperable even though the bistable is tripped.
- B. Incorrect, first part is incorrect. Plausible because it placed in shutdown bypass the reactor would trip. Second part is correct.
- C. Incorrect, first part is correct. Second part is incorrect. The function is inoperable even though the bistable is tripped.
- D. Correct, placing channel B in MANUAL BYPASS will affect the trip logic however will not result in a Rx trip. TS B 3.3.1 states "When an RPS channel is manually tripped, the functions that were inoperable prior to tripping remain inoperable."**

---

Technical Reference(s): **T.S 3.3.1, IC-RPS Rev 15**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **IC-RPS Obj R 6**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**Rewrote question to include operability determination. >>> reworded question.  
GL OK**

**1 POINT**

**Question 89**

Unit 1 initial conditions:

- Reactor power = 100%
- 1A and 1C RBCUs operating in low speed
- 1C and 1B RBCUs will be switched for run time

Current conditions:

- 1B RBS pump in recirc for testing
- 1C RBCU secured
- 1B RBCU started in low speed
- OAC alarm 1B RBCU Vibration HIGH and can not be cleared

Based on the current conditions, which ONE of the following describes actions to be taken per OP/1104/015 (Reactor Building Cooling), and whether RB pressure will be maintained below the design pressure during a subsequent LOCA?

- A. Start 1C RBCU, then stop 1B RBCU  
RB pressure will be maintained below design pressure
- B. Start 1C RBCU, then stop 1B RBCU  
RB pressure will NOT be maintained below design pressure
- C. Stop 1B RBCU, wait 30 minutes to start 1C RBCU if desired  
RB pressure will be maintained below design pressure
- D. Stop 1B RBCU, wait 30 minutes to start 1C RBCU if desired  
RB pressure will NOT be maintained below design pressure

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Question 89

**T2/G1**

022G2.1.32 Containment Cooling

**Ability to explain and apply system limits and precautions. (3.8/4.0)**

**K/A MATCH ANALYSIS**

A precaution associated with RBCU vibration and restart limits.

**SRO-ONLY ANALYSIS**

10CFR55.43(b) item 2 is met because the SRO must be able to interpret the failure, and its impact on plant operation for technical specifications bases.

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect, first part is incorrect. Plausible because this sequence would normally be allowed. Second part is correct.
- B. Incorrect, first part is incorrect. Plausible because this sequence would normally be allowed. Second part is incorrect. Plausible if candidate does not know how many cooling units and spray pumps assumed in the basis.
- C. Correct, per OP/1/A/1104/015 L&P the 1B RBCU must be stopped and not restarted for at least 30 minutes. TS 3.6.5 Bases states 1 RBS train and 2 RBCUs are required to ensure RB pressure stays below design during a LOCA.**
- D. Incorrect, first part is correct. Second part is incorrect. Plausible if candidate does not know how many cooling units and spray pumps assumed in the basis.

---

Technical Reference(s): **OP/1/A/1104/015 Rev 38, TS 3.6.5**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **PNS-RBC R20, R11**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**Rewrote question to require TS basis information. >>> Moved RBS in recirc to current conditions. GL OK**

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**1 POINT**

**Question 90**

Unit 1 plant conditions:

Time = 0400:00

- Reactor power = 75% power
- AMSAC/DSS Bypassed
- TDEFDW Pump out of service
- 1A FDW Pump trips

Time = 0402:00

- 1B FDW Pump trips

Time = 0402:05

- Switchyard Isolation occurs

Which ONE of the following describes the technical specification basis for the automatic reactor trip and the EOP tab that the SRO will direct?

**ASSUME NO ADDITIONAL FAILURES OCCUR**

- A. Minimize challenges to the Pzr PORV / Subsequent Actions
- B. Minimize challenges to the Pzr PORV / Loss of Heat Transfer
- C. Prevent exceeding DNBR limits / Subsequent Actions
- D. Prevent exceeding DNBR limits / Loss of Heat Transfer

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Question 90

**T2/G1 - ja**

059A2.01 Main Feedwater

**Ability to (a) predict the impacts of the following malfunctions or operations on the MFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Feedwater actuation of AFW system (3.4\*/3.6\*)**

**K/A MATCH ANALYSIS**

KA is matched because the item tests knowledge that EFW starts on FDW Pump trip, and controls at different levels whether on forced or natural circulation

**SRO-ONLY ANALYSIS**

10CFR55.43(b) item 5 is met because the applicant must recognize and assess plant conditions and determine procedure used to control the plant based on those conditions.

**ANSWER CHOICE ANALYSIS**

Answer: **A**

- A. Correct. Purpose of the Anticipatory Trip in RPS is to prevent challenge to the PORV By anticipating high pressure resulting from loss of Feedwater, additional time is gained to recover FDW (Main or Emergency) to prevent challenging the PORV. Subsequent Actions will be directed by the SRO while the RO's perform Rule 3 and Symptom Check.**
- B. Incorrect, Reason is correct. Procedure selection is plausible because the stem of the question provides information that leads to a loss of Feedwater with a Loss of Power. MD EFWP's would not be available if power is not regained in a timely manner.
- C. Incorrect, basis is incorrect but plausible because with a loss of FDW heat removal from the core will be limited and fuel temperature would increase. Subsequent Actions will be directed by the SRO while the RO's perform Rule 3 and a Symptom Check.
- D. Incorrect, basis is incorrect but plausible because with a loss of FDW heat removal from the core will be limited and fuel temperature would increase. See B.

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Technical Reference(s): **TS Basis 3.3.1**  
**IC-RPS Rev 15**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **IC-RPS Obj R4**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: **Memory or Fundamental Knowledge**

**Comprehension or Analysis**

**Slightly modified stem for clarification. Added "ASSUME NO ADDITIONAL FAILURES OCCUR" for clarification.>>> GL OK -- Modified A and B to ensure a correct answer. GL OK**

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**1 POINT**

**Question 91**

Unit 3 plant conditions:

- Shutdown for refueling in progress
- Mode 4
- Component Handling in progress in the Spent Fuel Pool
- A fuel assembly is currently in the mast and being moved
- 3RIA-6 (SFP Area Monitor) shows an observable increase, approximately  $\frac{1}{2}$  decade above background
- Spent Fuel Pool level = (-) 2.7 feet decreasing

Based on the above conditions, which ONE of the following describes the Abnormal Procedure that will provide direction for system operations to mitigate the event and a required Technical Specification entry and its bases?

- A. Enter AP/35 (Loss of SFP Cooling and/or Level)  
TS 3.10.1 (SSF) - Ensures the RC Makeup pump can maintain all three Oconee Units in MODE 3 for a minimum of 72 hours.
- B. Enter AP/35 (Loss of SFP Cooling and/or Level)  
TS 3.7.11 (Spent Fuel Pool Water Level) - Ensures adequate iodine removal during a fuel handling accident.
- C. Enter AP/18 (Abnormal Release of Radioactivity)  
TS 3.10.1 (SSF) - Ensures the RC Makeup pump can maintain all three Oconee Units in MODE 3 for a minimum of 72 hours.
- D. Enter AP/18 (Abnormal Release of Radioactivity)  
TS 3.7.11 (Spent Fuel Pool Water Level) - Ensures adequate iodine removal during a fuel handling accident.

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Question 91

**T2/G2**

033G2.4.11 Spent Fuel Pool Cooling

**Knowledge of abnormal condition procedures. (4.0/4.2)**

**K/A MATCH ANALYSIS**

Item demonstrates knowledge of AOP as well as entry to AOP. Required knowledge of makeup sources as well as entry conditions

**SRO-ONLY ANALYSIS**

10CFR55.43(b) item 2, 5, and 6 are met because the SRO is making a determination of procedure entry based on plant conditions, TS applicability based upon makeup sources, and Fuel Handling-related procedure

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect, first part is correct. TS entry not required.
- B. Correct, AP/35 (Loss of SFP Cooling and/or Level) should be entered due to low SFP level. SFP water level limit is based on ensuring adequate iodine removal during a fuel handling accident.**
- C. Incorrect, first part is incorrect because RIA is not in alarm. Plausible because the RIA is increasing. Second part is plausible because this is true for 72 hours.
- D. Incorrect, first part is incorrect because RIA is not in alarm. Plausible because the RIA is increasing. Second part is incorrect. Plausible because the water does provide shielding and reduces dose rate.

---

Technical Reference(s): **AP/3/A/1700/035 Rev 5**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-APG Obj R9**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**Modified answers to include TS basis information. >>> Modified distractors. GL  
Ok**

**1 POINT**

**Question 92**

Unit 1 initial conditions:

- Reactor power = 50%
- A turbine trip occurs
- 1A SG Startup Control Valve fails open

Current conditions:

- 1A SG level = 97% Operating Range (OR) increasing

Based on the above conditions, which ONE of the following describes the actions required by the Subsequent Actions tab of the EOP and the basis?

- A. Trip BOTH Main FDW pumps and steam the 1A SG to prevent flooding the aspirating ports
- B. Trip BOTH Main FDW pumps and close the 1A TBVs to prevent water hammer in the main steam line
- C. Manually throttle Main FDW to control SG level < 96% and steam the 1A SG to prevent flooding the aspirating ports
- D. Manually throttle Main FDW to control SG level < 96% and close the 1A TBVs to prevent water hammer in the main steam line

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Question 92

**T2/G2**

035A2.02 Steam Generator

**Ability to (a) predict the impacts of the following malfunctions or operations on the SGs; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Reactor trip/turbine trip (4.2/4.4)**

**K/A MATCH ANALYSIS**

KA is matched because the impact on SGs is examined, as well as the procedural direction to check OTSG pressure control in faulted circumstances

**SRO-ONLY ANALYSIS**

10CFR55.43(b) item 2 is evaluated because the applicant must determine the correct TS basis for plant operation, after determining whether an event should cause a reactor trip

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect: first part is correct. Second part is incorrect. Plausible because this could occur with high SG level.
- B. Correct, EOP direction is to trip both main FDW pumps if SG level is > 96%. The TBV is closed to prevent water hammer in the MS line.**
- C. Incorrect, first part is incorrect. Plausible because FDW is throttled to keep level below 96%. Second part is incorrect. Plausible because this could occur with high SG level.
- D. Incorrect, first part is incorrect. Plausible because FDW is throttled to keep level below 96%. Second part is correct.

---

Technical Reference(s): **IC RPS Rev 15**  
**TS 3.3.1 Basis**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-SA Obj R5**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**Rewrote answers to include EOP step bases.>>> GL OK**

**1 POINT**

**Question 93**

Plant conditions:

- All 3 units are in Mode 1
- 1SA-3/B-6 (Fire Alarm) actuated
- The alarm was generated from address point 0202041
- Subsequently, a Challenging Active Fire is reported in the affected area
- The fire continues for approximately 15 minutes
- The affected control room(s) have been evacuated
- All subsequent required actions were taken within 10 minutes

Which ONE of the following describes ALL of the units affected by the fire in accordance with the alarm response, and which ONE of the following describes the minimum emergency classification for this event?

**SEE ATTACHMENT**

- A. Units 1 and 2 ONLY; Unusual Event
- B. Units 1 and 2 ONLY; Alert
- C. All 3 Units; Unusual Event
- D. All 3 Units; Alert

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Question 93

**T2/G2**

086G2.4.41 Fire Protection

**Knowledge of the emergency action level thresholds and classifications. (2.9/4.6)**

**K/A MATCH ANALYSIS**

KA is matched because the only classification related to plant fire protection is caused by length of fire, equipment affected, and whether SSF is activated

**SRO-ONLY ANALYSIS**

10CFR55.43(b) item 5 is met because it is the SROs responsibility to determine emergency classification based upon description of plant conditions

**ANSWER CHOICE ANALYSIS**

**Answer: D**

- A. Incorrect, all 3 units affected, but other SSF risk areas affect only units 1 and 2
- B. Incorrect, correct classification but incorrect units
- C. Incorrect, correct units, but incorrect classification. Plausible because UE is the only other classification that could be called for Fires
- D. Correct, for Unit 1 Cable Room, all 3 units affected, and since control was established at SSF, the classification is alert**

---

Technical Reference(s): **RP/0/B/1000/001, enclosure 4.1 - 4.7**  
**1SA-3/B-6**

Proposed references to be provided to applicants during examination:  
**RP/0/B/1000/001, enclosure 4.1 - 4.7, 1SA-03 /B-6**

Learning Objective: **IC-FDS R6**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

-- Moved evacuate CR to a new bullet to make question easier to read. GL OK

**1 POINT**

**Question 94**

Unit 1 initial conditions:

- Reactor power = 100%
- Loss of all Main and Emergency feedwater occurs
- All CBPs are tripped
- Rule 3 (Loss of Main or Emergency FDW) initiated
- Loss of Heat Transfer tab initiated

Current conditions:

- RCS pressure = 2305 psig increasing
- Rule 4 (Initiation of HPI Forced Cooling) has just been initiated
- 1B HPIP tripped

Based on the above conditions, which ONE of the following describes the correct action and the requirements for plant announcement?

- A. Ensure adequate HPI flow in both headers / "Emergency dose limits in effect" will be announced to plant staff per the parallel action page.
- B. Open reactor vessel head and loop vents / "Emergency dose limits in effect" will be announced to plant staff per the parallel action page.
- C. Ensure adequate HPI flow in both headers / "Emergency dose limits in effect" will NOT be announced to plant staff since Emergency Dose limits have previously been in effect.
- D. Open reactor vessel head and loop vents / "Emergency dose limits in effect" will NOT be announced to plant staff since Emergency Dose limits have previously been in effect.

Question 94

**T3**

G2.1.14

**Knowledge of criteria or conditions that require plant-wide announcements, such as pump starts, reactor trips, mode changes, etc. (3.1/3.1)**

**K/A MATCH ANALYSIS**

Meets KA because the item evaluates what information will be provided in a plant announcement on transition to an EOP recovery procedure (tab)

**SRO-ONLY ANALYSIS**

10CFR55.43(b) item 5 is met because the SRO must evaluate plant conditions during a loss of feedwater, and determine which rule is in effect and which tab will govern the actions.

**ANSWER CHOICE ANALYSIS**

**Answer: A**

- A. Correct, if RCS pressure >2300 while performing Rule 3, then initiate Rule 4 if no feed available. If HPI CD is performed, a LOCA will be created, and emergency dose limits will be in effect (EDLs will be announced to the plant).**
- B. Incorrect, first part is incorrect. Plausible because this action would be taken if only one HPI header had flow. Second part is correct.
- C. Incorrect, first part is correct. Second part is incorrect. Plausible because it is reasonable to assume that once it has been announced it does not have to be repeated.
- D. Incorrect, first part is incorrect. Plausible because this action would be taken if only one HPI header had flow. Second part is incorrect. Plausible because it is reasonable to assume that once it has been announced it does not have to be repeated.

---

Technical Reference(s): **Rule 3 Rev. 36,**  
**OMP 1-18, pg 6 Rev. 25**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-LOHT R28**

Question Source: **Modified SRO 81 from 2007 NRC Exam**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**Updated answer analysis. Removed transfer from answers. >>> GL OK**

**1 POINT**

**Question 95**

Unit 1 initial conditions:

- Mode 6
- Fuel Transfer Canal level = 21.5 feet
- 1C LPI pump operating

Current conditions:

- Main Fuel Bridge operator has requested temporarily securing 1C LPI pump to facilitate fuel assembly insertion

Based on the above conditions, which ONE of the following describes who approves securing the 1C LPI pump in accordance with OP/1502/007 (Operations Defueling/Refueling Responsibilities) and any additional requirements?

- A. Refueling SRO / 1C LPI pump may be stopped provided movement of irradiated fuel assemblies is suspended immediately
- B. Operations Outage Manager / 1C LPI pump may be stopped provided movement of irradiated fuel assemblies is suspended immediately
- C. Refueling SRO / 1C LPI pump may be stopped for up to 1 hour per 8 hour period
- D. Operations Outage Manager / 1C LPI pump may be stopped for up to 1 hour per 8 hour period

Question 95

**T3 - gcw**

G2.1.42

**Knowledge of new and spent fuel movement procedures. (2.5/3.4)**

**K/A MATCH ANALYSIS**

Question requires knowledge of the requirements FH procedures.

**SRO-ONLY ANALYSIS**

SRO knowledge of fuel handling procedures and TSs.

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect, first part is correct. Second part is plausible because this is a TS required action if one DHR loop is not in service.
- B. Incorrect, first part is incorrect. Plausible because the OSM normally gives permission for high risk evolutions. Second part is plausible because this is a TS required action if one DHR loop is not in service.
- C. Correct, per OP/1/A/1502/07(Operations Defueling/Refueling Responsibilities) Limits and Precautions the refueling SRO must approve stopping the LPI pump. TS 3.9.4 (DHR and Coolant Circulation) all this for  $\leq 1$  hour per 8 hours.**
- D. Incorrect, first part is incorrect. Plausible because the OSM normally gives permission for high risk evolutions. Second part is correct.

---

Technical Reference(s): **OP/1/A/1502/007 L&P Rev. 79**  
**TS 3.9.4**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **FH-FHS R21**

Question Source: **Bank, FH043601**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**>>> Modified stem. GL OK -- Changed B and D because "D" could be correct due to a recent change in outage staffing. GL OK**

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**1 POINT**

**Question 96**

Unit 1 plant conditions:

- MODE 2
- RCS pressure = 2755 psig

Which ONE of the following states the Technical Specification required action and its basis?

- A. Restore RCS pressure within 5 minutes  
5 minute time limit is based on the increased probability of brittle fracture
- B. Restore RCS pressure within 5 minutes  
5 minute time limit is based on the capacity of the PORV to return system pressure to within the safety limit
- C. Restore RCS pressure and be in MODE 3 within 1 hour  
1 hour time limit is based on changing to a mode where the potential for additional safety system challenges is minimized
- D. Restore RCS pressure and be in MODE 3 within 1 hour  
1 hour time limit is based on the capacity of the PORV to return system pressure to within the safety limit

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Question 96

**T3 - gcw**

G2.2.22

**Knowledge of limiting conditions for operations and safety limits. (4.0/4.7)**

**K/A MATCH ANALYSIS**

Question requires knowledge of the TS safety limit.

**SRO-ONLY ANALYSIS**

Question requires knowledge of the TS safety limit basis.

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect - This is the required actions and bases for the plant in MODES 3,4,5.
- B. Incorrect - This is the required action for the plant in mode 3,4,5. The bases statement is incorrect. No credit is taken for the PORV in the bases.
- C. Correct - This is the correct action for MODE 2 and the correct bases for the action to be taken due to the violation of the Safety Limit.**
- D. Incorrect - This is the correct action for MODE 2, however the bases statement is incorrect. No credit is taken for the PORV in the bases.

---

Technical Reference(s): **TS 2.1.2 (RCS Pressure Safety Limit)**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **ADM-TSS R5**

Question Source: **Bank ADM160504**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**GL OK -- Added " additional" to "C" to ensure answer is correct.**

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1 POINT

Question 97

Unit 1 plant conditions:

- Startup in progress
- Control rod group 1 = 100% withdrawn
- Control rod group 2 = 100% withdrawn
- Control rod group 3 = 100% withdrawn
- Control rod group 4 = 0 % withdrawn
- TD EFDW pump OOS

Based on the above conditions, which ONE of the following describes the current technical specification operational MODE, and whether a change to the next higher Mode is allowed and why?

A. Mode 2

No, T.S. 3.0.4 does NOT allow a Mode change unless the applicable action statements for the next higher Mode allow continued operation without time limits.

B. Mode 2

Yes. T.S. 3.0.4 allows a Mode change as long as the applicable condition statements are entered upon entry to the next higher Mode.

C. Mode 3

No. T.S. 3.0.4 does NOT allow a Mode change unless the applicable action statements for the next higher Mode allow continued operation without time limits.

D. Mode 3

Yes. T.S. 3.0.4 allows a Mode change as long as the applicable condition statements are entered upon entry to the next higher Mode.

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Question 97

**T3 – ja/jmb**

G2.2.35

**Ability to determine Technical Specification Mode of Operation. (3.6/4.5)**

**K/A MATCH ANALYSIS**

KA requires determination of mode. Item addresses condition where mode is in process of being changed.

**SRO-ONLY ANALYSIS**

10CFR55.43(b) item 2 is met because the SRO must understand Technical Specification concerning RPS.

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect, first part is incorrect. Mode 2 in not entered until CR Group 5 is withdrawn. Second part is correct.
- B. Incorrect, both parts are incorrect.
- C. Correct, mode 2 in not entered until CR Group 5 is withdrawn. T.S. 3.0.4 does NOT allow a Mode change unless the applicable action statements for the next higher Mode allow continued operation without time limits.**
- D. Incorrect, first part is correct. Second part is incorrect. Plausible because entry would be made if a mode change was made.

---

Technical Reference(s): **TS 1.0.1 Definition, TS 3.3.1, TS 3.0.4**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **CP-011 R37/38**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**Changed TS to TD to ensure only one correct answer. GL OK -- Changed TD to MD to use a TS that better fits the situation. Changed back. GL OK**

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**1 POINT**

**Question 98**

Which ONE of the following describes the MINIMUM level of authority for approval of ONE (1) GWR release at the 1/3 Station Limit, and the SLC bases for limiting the Curie content of the GWD Tanks?

- A. OSM approval / limits Whole Body exposure of individual at the nearest exclusion boundary to  $\leq 0.5$  Rem in the event of an GWD tank rupture.
- B. OSM approval / limits Whole Body exposure of individual at the nearest exclusion boundary to  $\leq 100$  mrem during a planned GWD tank release.
- C. SRO approval / limits Whole Body exposure of individual at the nearest exclusion boundary to  $\leq 0.5$  Rem in the event of an GWD tank rupture.
- D. SRO approval / limits Whole Body exposure of individual at the nearest exclusion boundary to  $\leq 100$  mrem during a planned GWD tank release.

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Question 98

**T3**

G2.3.6

**Ability to approve release permits. (2.0/3.8)**

**K/A MATCH ANALYSIS**

KA matched because the test item evaluates the SROs understanding of conditions that will determine approval authority of a gaseous radioactive release

**SRO-ONLY ANALYSIS**

10CFR55.43(b) item 4 is met because the SRO must evaluate conditions that support radioactive effluent release; 10CFR55.43(b) item 2 is met for SLC limitations

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect: OSM approval not required. Plausible because OSM approval is required for some releases (2GWRs).
- B. Incorrect: OSM approval not required. Plausible because OSM approval is required for some releases (2GWRs).
- C. Correct: SRO approval only required. Basis for limit in GWD tanks based on exposure at site boundary of .5 REM.**
- D. Incorrect: Basis for limit in GWD tanks based on exposure at site boundary of .5 REM. Plausible because yearly limit at site boundary for unmonitored personnel is 100 mrem.

---

Technical Reference(s): **OP/1-2/A/1104/018 Rev 62**  
**SLC 16.11.13**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **WE-GWD Obj R6**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: **Memory or Fundamental Knowledge**  
Comprehension or Analysis

**GL OK**

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1 POINT

Question 99

Unit 1 initial conditions:

- Reactor power = 100%
- RCS pressure = 1900 psig decreasing

Current conditions:

- A manual reactor trip was initiated
- Numerous control rods indicate fully withdrawn
- Reactor power indicates 4% and stable
- RCS pressure is decreasing rapidly
- SCM = 0°F
- IMAs in progress

Which ONE of the following describes how the SRO will transition through the EOP for this event?

- A. Transfer to Subsequent Actions  
Transfer to Loss of Subcooling Margin Tab using Parallel Actions page  
Transfer to the LOCA Cooldown Tab from LOSCM tab
- B. Transfer to Subsequent Actions  
Transfer to Unanticipated Nuclear Power Production tab using Parallel Actions page  
Transfer to Loss of Subcooling Margin Tab using Parallel Actions page when UNPP tab is complete
- C. Transfer to Unanticipated Nuclear Power Production Tab  
Transfer to Subsequent Actions at the end of the UNPP tab  
Transfer to Loss of Subcooling Margin Tab using Parallel Actions
- D. Transfer to Unanticipated Nuclear Power Production Tab  
Transfer to Loss of Subcooling Margin Tab using Parallel Actions page  
Transfer to the LOCA Cooldown Tab from LOSCM tab

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Question 99

**T3**

G2.4.21

**Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc. (4.0/4.6)**

**K/A MATCH ANALYSIS**

Item matches KA because it evaluates ability to prioritize procedures based upon given plant conditions. Choices selected were highest priority procedures

**SRO-ONLY ANALYSIS**

10CFR55.43(b) item 5 is met because the applicant must select the appropriate procedure usage for the conditions presented. Each of the procedure choices involves a high level procedure designed to evaluate protection of a safety function

**ANSWER CHOICE ANALYSIS**

**Answer: C**

- A. Incorrect: IMA's direct SRO to Rule 1. Rule 1 will direct the SRO to UNPP tab. Plausible because the SA tab is the first section of the EOP that the SRO will transfer to per the body of the EOP.
- B. Incorrect: IMA's direct SRO to Rule 1. Rule 1 will direct the SRO to UNPP tab. Plausible because the SA tab is the first section of the EOP that the SRO will transfer to per the body of the EOP.
- C. Correct: IMA's direct SRO to Rule 1. Rule 1 will direct the SRO to UNPP tab. When exited, UNPP will direct SRO to Subsequent Actions Tab. Parallel actions page of SA will direct the SRO to the LOSCM tab.**
- D. Incorrect: There is no direct transfer from the UNPP tab to the LOSCM tab. Plausible because the LOSCM tab is the next tab that the SRO will actually perform steps in.

---

Technical Reference(s): **IMA/SA, UNPP Rev 36**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-EOP Obj R26**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**GL OK - Underlined "stable" in stem. GL OK**

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03-20-2008

1 POINT

Question 100

Unit 1 initial conditions:

- Reactor power = 100%
- LOHT occurs
- Rule 3 initiated

Current conditions:

- EOP LOHT tab in progress
- 1A SG pressure = 980 psig stable
- 1B SG pressure = 200 psig decreasing

Based on the above conditions, which ONE of the following describes the proper progression in the EOP and why?

- A. Remain in the LOHT tab and reduce heat sources in the RCS by securing all RCPs.
- B. Remain in the LOHT tab and attempt to re-establish a heat sink with the intact SG.
- C. Transfer to the EHT tab to address the steam line break while attempting to establish feedwater flow with the TD EFDWP.
- D. Transfer to the EHT tab to provide guidance on stabilizing RCS press / temp to prevent a Pressurized Thermal Shock condition.

Question 100

**T3**

G2.4.22

**Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations. (3.6/4.4)**

**K/A MATCH ANALYSIS**

KA is met because the applicant must understand the reason for selection to actually make a procedure selection based upon symptom priority. Requires prioritization of LOHT and EHT at the same time.

**SRO-ONLY ANALYSIS**

10CFR55.43(b) item 5 is met because the SRO must determine appropriate procedure use among several procedures with differing priorities.

**ANSWER CHOICE ANALYSIS**

**Answer: B**

- A. Incorrect: Only two RCPs are secured in the LOHT tab. Plausible because securing all RCPs will reduce heat load.
- B. Correct: The LOHT tab is the higher priority based on plant conditions. The SRO will wait until FDW is restored or RCS pressure reaches 2300 psig (Initiate HPI Forced Cooling).**
- C. Incorrect: The LOHT tab is the higher priority based on plant conditions. Plausible because an EHT condition does exist.
- D. Incorrect: The LOHT tab is the higher priority based on plant conditions. Plausible because an EHT condition does exist

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Technical Reference(s): **EOP LOHT Rev 36**

Proposed references to be provided to applicants during examination: **None**

Learning Objective: **EAP-EOP Obj R26**

Question Source: **New**

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level:           Memory or Fundamental Knowledge  
**Comprehension or Analysis**

**GL OK**

## Oconee RO Exam Reference Material

### Question

71

Radiation work permit # 23  
Survey # M-123106-1

Steam Tables

## SRO Exam Reference Material

### Question

### Reference

86

OP/0/A/1108/001, Encl 3.31, pgs 1-5,

93

RP/0/B/1000/001, Encl 4.1 - 4.7  
1SA-3/B-6, Fire Alarm