

**Exam Bank No.:** 1940

**Last used on an NRC exam:** 2010

**RO Sequence Number:** 1

In accordance with OPGP03-ZF-0011, STPEGS Fire Brigade, what is the minimum compliment of operators required to staff the plant fire brigade?

- A. 3
- B. 4
- C. 5
- D. 6

**Answer: C 5**

**Exam Bank No.:** 1940

**K/A Catalog Number:** G2.4.26                      **Tier:** 3    **Group/Category:**

**RO Importance:** 3.1    **10CFR Reference:** 55.41(b)(10)

Knowledge of the facility protection requirements, including fire brigade and portable fire fighting equipment usage.

**STP Lesson:** LOT 507.01    **Objective Number:** 92186

Given the title of an administrative procedure, DISCUSS the requirements associated with the referenced procedure.

**Reference:** OPGP03-ZF-0011, Rev 11, step 5.1.2

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank                      **Modified from**

**Distractor Justification**

- A: INCORRECT: This number represents the normal shift compliment for Ros
- B: INCORRECT: This number represents the minimum number of Safe Shutdown Plant Operators required to be on shift
- C: CORRECT: At least 5 members are required to staff the fire brigade.
- D: INCORRECT: This number represents the normal on shift compliment of Plant Operators

**Question Level:** F                      **Question Difficulty** 2

**Justification:**

Requires a basic knowledge of fire brigade staffing requirements.

**Exam Bank No.:** 2069

**Last used on an NRC exam:** Never

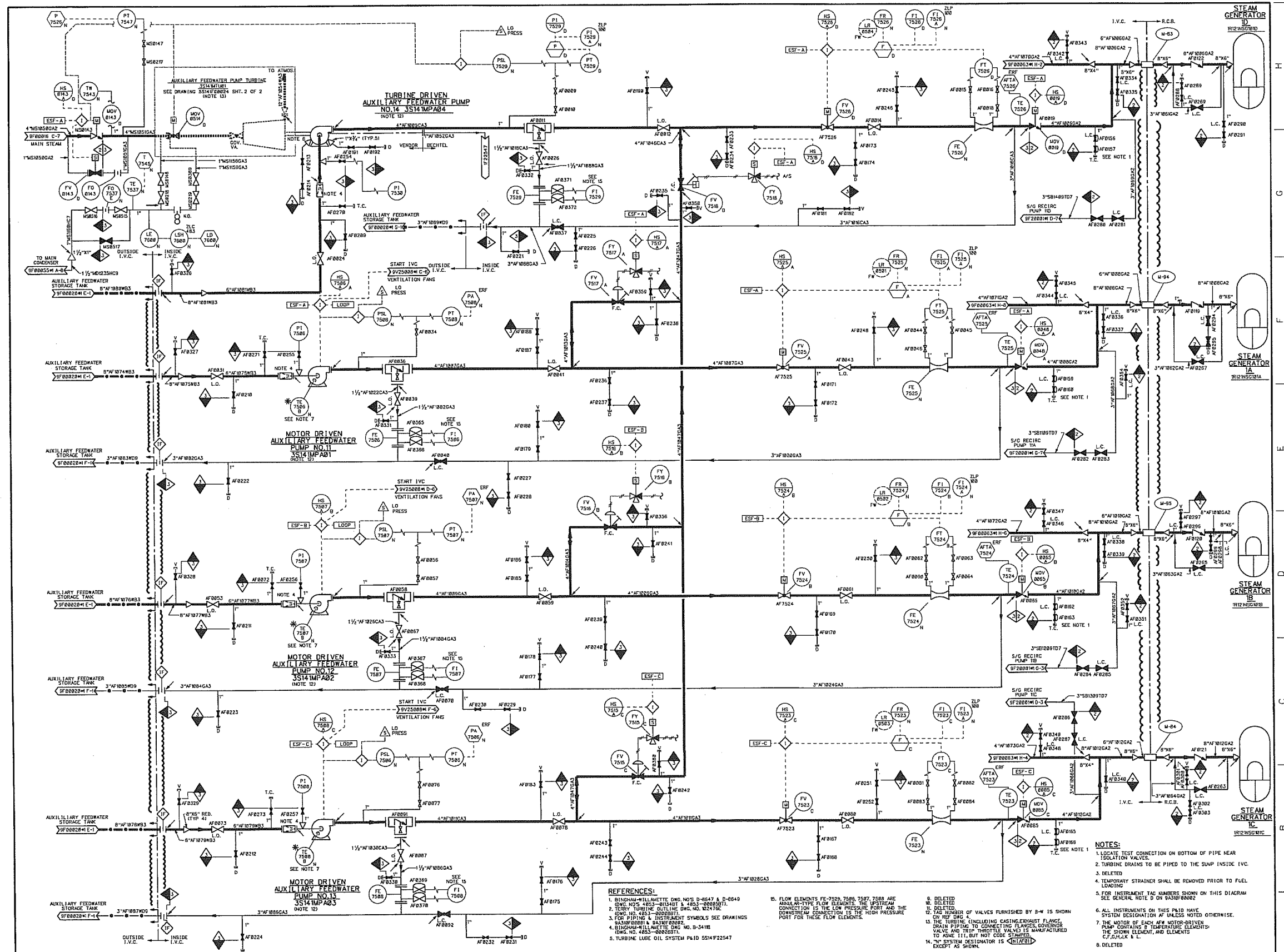
**RO Sequence Number:** 2

The attached is an example of an STP system P&ID. As a Control Room Operator, if you needed to obtain a P&ID, you \_\_\_\_\_.

Referring to the attached P&ID, the AFW Cross-connect valves (FV-7515, 7516, 7517, 7518) will fail closed on a loss of \_\_\_\_\_.

	Obtaining a P&ID	AFW Cross-Connect Valves will fail closed on a loss of:
A	can obtain one within the Control Room	air supply OR solenoid power
B	have to contact Document Control	air supply ONLY
C	have to contact Document Control	air supply OR solenoid power
D	You can obtain one within the Control Room	air supply ONLY

**Answer:** A can obtain one within the Control Room; air supply OR solenoid power



**REFERENCES:**

- BINGHAM-WILMETTE DWG. NOS. D-8447 & D-8448 (DWG. NOS. 4853-813481 & 4853-808807).
- TURBINE OUTLINE DWG. NO. 824702 (DWG. NO. 4853-808807).
- FOR PIPING & INSTRUMENT SYMBOLS SEE DRAWINGS 9430F0801 & 9430F0802.
- BINGHAM-WILMETTE DWG. NO. B-3416 (DWG. NO. 4853-808807).
- TURBINE LUBE OIL SYSTEM P&ID SSN72547

1. FLOW ELEMENTS FE-7529, 7530, 7537, 7538 ARE ANNUAL-TYPE FLOW ELEMENTS. THE UPSTREAM CONNECTION IS THE LOW PRESSURE PORT AND THE DOWNSTREAM CONNECTION IS THE HIGH PRESSURE PORT FOR THESE FLOW ELEMENTS.

- DELETED
- DELETED
- DELETED
- THE NUMBER OF VALVES FURNISHED BY B-4 IS SHOWN ON THE Dwg.
- THE TURBINE (INCLUDING CASTING/EXHAUST) DRAIN PIPING TO CONNECTING FLANGES, FLOWING VALVE AND TRIP THROTTLE VALVE IS MANUFACTURED TO ASME 11.1, BUT NOT CODE STAMPED.
- SYSTEM DESIGNATOR IS (N/A) EXCEPT AS SHOWN.

**NOTES:**

- LOCATE TEST CONNECTION ON BOTTOM OF PIPE NEAR ISOLATION VALVES.
- TURBINE DRAINS TO BE PIPED TO THE SUMP INSIDE I.V.C.
- DELETED
- TEMPORARY STRAINER SHALL BE REMOVED PRIOR TO FUEL LOADING
- FOR INSTRUMENT TAG NUMBERS SHOWN ON THIS DIAGRAM SEE GENERAL NOTE D ON DRAWING 9430F0802
- ALL INSTRUMENTS ON THIS P&ID HAVE SYSTEM DESIGNATION AF UNLESS NOTED OTHERWISE.
- THE MOTOR OF EACH MOTOR-DRIVEN PUMP CONTAINS 9 TEMPERATURE ELEMENTS. THE SHOWN ELEMENT, AND ELEMENTS C7, D4, K & L.
- DELETED

NO.	ISSUE DATE	REVISION	ORIG	CR	RE	DV	SE	NO.	ISSUE DATE	REVISION	ORIG	CR	RE	DV	SE
12	04-23-84	REVISED PER CR 88-7924.	JCL	NS											
11	7-11-87	INCCOR. DCH 8709857.	JSH	ON	FILE										
10	5-23-87	INCCOR. DCH 0600026.	JSH	ON	FILE										
9	7-26-86	REVISED PER CR 86-8934	JCL	ON	FILE										
8	10-5-81	INCCOR. DCH 9984267.	LNB	ON	FILE										
7	6-6-84	ISSUED FOR CONSTRUCTION.													

**SOUTH TEXAS PROJECT**  
**NUCLEAR OPERATING COMPANY**

PRIORITY: 1  
 CADD FILE NO.: F8282.121  
 FSUB. NO.: 0878928  
 STI. NO.: 3233431

PIPING & INSTRUMENTATION DIAGRAM  
 AUXILIARY FEEDWATER

SCALE: NONE  
 Dwg. NO.: 5S141F0024  
 SHT. REV.: 1 12

**Exam Bank No.:** 2069

**K/A Catalog Number:** G.2.2.41                      **Tier:** 3    **Group/Category:**

**RO Importance:** 3.5      **10CFR Reference:** 55.41(b)(10)

Ability to obtain and interpret station electrical and mechanical drawings.

**STP Lesson:** NLO 100.09      **Objective Number:** 30009

Interpret information and use symbols and acronyms used in drawings.

**Reference:** 0PGP03-ZA-0010, Rev. 31, NLO 100.09

**Attached Reference**  **Attachment:** 11x17 copy of P&ID 5S141F00024, Sheet 1 (U1 AFW System)

**NRC Reference Req'd**  **Attachment:**

**Source:** New                      **Modified from**

**Distractor Justification**

- A: CORRECT: The Control Room is a Level 1 Document Control station and contains the most up-to-date procedures and prints. The AFW cross-connect valves will fail closed on loss of either air or solenoid power as represented by the symbology of the air supply solenoid valve.
- B: INCORRECT: The Control Room is a Level 1 Document Control station and contains the most up-to-date procedures and prints therefore Document Control does not have to be contacted. Additionally, the AFW valves will fail closed on loss of air or power as depicted by the drawing symbol for the air supply solenoids.
- C: INCORRECT: The Control Room is a Level 1 Document Control station and contains the most up-to-date procedures and prints therefore Document Control does not have to be contacted. The failure modes stated are correct.
- D: INCORRECT: The location information stated is correct (can get a print in the Control Room), but the failure information is not correct. The AFW valves will fail closed on loss of air or power as depicted by the drawing symbol for the air supply solenoids.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

student must be able to interpret P&ID symbols and system configurations to determine the failure mode of the AFW valves.

**Exam Bank No.:** 2092

**Last used on an NRC exam:** Never

**RO Sequence Number:** 3

Given the following:

- An event has occurred in Unit 1 that required the crew to trip the Reactor and enter the EOP's.
- The crew is currently performing the actions of 0POP05-EO-ES11, SI Termination.
- The Unit Supervisor has directed you to perform Addendum 2, Establishing Normal Letdown.
- You are currently at Step 7 as follows:

- \_\_\_\_\_ 7 OPEN letdown line containment isolation valves.
- o OCIV MOV-0024
  - o ICIV MOV-0023

Based on the format of Step 7 above, which one of the following correctly describes how Step 7 is to be performed in accordance with 0POP01-ZA-0018, EOP Users Guide?

MOV-0024 and MOV-0023...

- A. can be opened in any order. Opening EITHER valve will satisfy the requirements of Step 7.
- B. can be opened in any order, but BOTH valves must be opened. You can act to open the second valve before the first valve has fully opened.
- C. MUST be operated in the sequence listed. You can act to open the second valve before the first valve has fully opened.
- D. MUST be operated in the sequence listed. BOTH valves must be opened.

**Answer:** B can be opened in any order, but BOTH valves must be opened. You can act to open the second valve before the first valve has fully opened.

**Exam Bank No.:** 2092

**K/A Catalog Number:** EPE W/EO2 EA2.2      **Tier:** 1      **Group/Category:** 2

**RO Importance:** 3.5      **10CFR Reference:** 55.41(b)(10)

Ability to determine and interpret the following as they apply to the (SI Termination): Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

**STP Lesson:** LOT 507.01      **Objective Number:** 92186

Given the title of an administrative procedure, DISCUSS the requirements associated with the referenced procedure.

**Reference:** OPOP01-ZA-0018, Rev. 19; OPOP05-EO-ES11, Rev. 14

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified from**

**Distractor Justification**

- A: INCORRECT: The valves can be opened in any order, as stated, but BOTH must be opened to complete the step. Per the EOP Users Guide, if there is no 'OR' between bullets, there is an implied 'AND' thus all bulleted items must be completed.
- B: CORRECT: per the EOP Users Guide, substeps separated by bullets can be done in any order. If there is no 'OR' between bullets, there is an implied 'AND' thus all bulleted items must be completed. Additionally, it's not necessary for a required action to be fully completed before proceeding to the next action. If it's important that a particular step be completed before continuing on, the step will state this.
- C: INCORRECT: per the EOP Users Guide, if substeps must be completed in the listed order, they will be designated alpha-numerically, not with bullets. The operator can open the second valve before the first is open, as stated.
- D: INCORRECT: per the EOP Users Guide, if substeps must be completed in the listed order, they will be designated alpha-numerically, not with bullets. It is true that both valves must be opened to complete the step.

**Question Level:** F      **Question Difficulty** 3

**Justification:**

Student must know the requirements of the EOP Users Guide and how to implement them.

**Exam Bank No.:** 1730

**Last used on an NRC exam:** Never

**RO Sequence Number:** 4

Given the following:

- Unit 1 has shutdown due to Steam Generator tube leakage in 'C' SG.
- 'C' MSIV will not close from the Control Room

In accordance with OPOP04-RC-0004, Steam Generator Tube Leakage, what action is prescribed to close 'C' MSIV?

- A. At the Auxiliary Shutdown Panel (ASP), transfer control of 'C' MSIV to the ASP, then use the control switch at the ASP to close 'C' MSIV.
- B. At the Transfer Panel in the 'C' Train Switchgear Room, transfer control of 'C' MSIV to the ASP, then use the control switch at the ASP to close 'C' MSIV.
- C. Locally at 'C' MSIV, isolate the air supply to 'C' MSIV, then vent the air from the 'C' MSIV operator.
- D. Locally at 'C' MSIV, bypass the air solenoid valve to pressurize the valve operator for 'C' MSIV causing it to close.

**Answer:** C Locally at 'C' MSIV, isolate the air supply to 'C' MSIV, then vent the air from the 'C' MSIV operator.



**Exam Bank No.:** 1730

**K/A Catalog Number:** 078 K1.05

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 3.4 **10CFR Reference:** 55.41(b)(4)

Knowledge of the physical connections and/or cause-effect relationships between the IAS and the following systems: MSIV air.

**STP Lesson:** LOT 505.01 **Objective Number:** 92108

Given a plant condition, STATE the actions required to be performed per the applicable Off-Normal procedure.

**Reference:** OPOP04-RC-0004, Rev. 26

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank

**Modified from**

**Distractor Justification**

- A: INCORRECT: This is not the direction in the appropriate procedure. Additionally, there are no controls for the MSIV's outside the Control Room.
- B: INCORRECT: This is not the direction in the appropriate procedure. Additionally, there are no controls for the MSIV's outside the Control Room.
- C: CORRECT: The MSIV's are air operated valves and have no control switches outside of the control room. They are designed to fail closed on loss of air therefore air pressure must be bled off the valve operators to close them.
- D: INCORRECT: There is no bypass for the air solenoids on the MSIV air system. Other air valves in the plant do have a provision for bypassing their air solenoids. Additionally, the MSIV's are designed to fail closed on loss of air. Pressurizing their valve operators will open the MSIV's.

**Question Level:** F **Question Difficulty** 2

**Justification:**

Student must know the required actions for closing the MSIV's from outside the Control Room.

**Exam Bank No.:** 1820

**Last used on an NRC exam:** Never

**RO Sequence Number:** 5

Given the following:

- Unit 1 is operating at full power.
- 480V LC E1A1 TRBL alarm occurs.
- 480V Load Center E1A1 Bus Volts = 0 volts
- Annunciator 125 VDC SYSTEM E1A11 TRBL alarms.
- Channel 1 BATT CUR indicates 30 amps discharge.

Assuming the plant responds as designed, and without operator action, a loss of Channel I 125 VDC power...

- A. HAS occurred. DP1201 and DP001 are now powered from their respective Voltage Regulating Transformers.
- B. HAS occurred. Only DP1201 is powered from its respective Voltage Regulating Transformer.
- C. has NOT occurred. Bus E1A11 is being powered from its respective ESF Battery.
- D. has NOT occurred. Bus E1A11 is being powered from its Standby Battery Charger.

**Answer:** C has NOT occurred. Bus E1A11 is being powered from its respective ESF Battery.

**Exam Bank No.:** 1820

**K/A Catalog Number:** APE 058 AA1.03      **Tier:** 1      **Group/Category:** 1

**RO Importance:** 3.1      **10CFR Reference:** 55.41(b)(7)

Ability to operate and/or monitor the following as they apply to the Loss of DC Power: Vital and battery bus components.

**STP Lesson:** LOT 201.37      **Objective Number:** 63901

GIVEN a loss of power, PREDICT the operation of the class 1E DC Electrical Distribution System to include automatic actions and interlocks.

**Reference:** LOT 201.37, Class 1E 125 VDC System

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank      **Modified from**

**Distractor Justification**

- A: INCORRECT: The 125 VDC Bus has NOT lost power. Because no power loss occurred, the 120 VAC panels will continue to be supplied from their respective inverters.
- B: INCORRECT: The 125 VDC Bus has NOT lost power. Because no power loss occurred, BOTH 120 VAC panels will continue to be supplied from their respective inverters which are being supplied by the Channel 1 125 VDC Bus.
- C: CORRECT: The 125 VDC Bus has NOT lost power. The symptoms indicate that a loss of the in-service Battery Charger has occurred. This will not result in a loss of power to the Ch. 1 125 VDC bus as the ESF Battery will automatically supply the bus.
- D: INCORRECT: The 125 VDC Bus has not lost power, as stated, but is being supplied from its ESF Battery. The Standby Charger must be placed in service manually.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

must be able to determine whether a loss of Vital DC power has occurred from the symptoms given. Then, based on what was lost, determine how the 125 VDC System will respond.

**Exam Bank No.:** 1744

**Last used on an NRC exam:** 2009

**RO Sequence Number:** 6

Given the following:

- AFW Pump 11 is running with a total flowrate of 540 gpm and a discharge pressure of 1550 psig.
- AFW Pump 11 is providing equal amounts of AFW flow to Steam Generators (SG) 1A, 1B, and 1C.

Which one of the below correctly describes the AFW System response as the AFW Regulating Valve for SG 1A is fully closed?

AFW flow to SG 1B and 1C will...

- A. rise because the discharge pressure of AFW Pump 11 has gone up.
- B. lower because the Auto Recirc Valve for AFW Pump 11 has opened fully.
- C. remain the same because the Auto Recirc Valve for AFW Pump 11 has opened to pass 180 gpm.
- D. remain the same because QDPS has opened the AFW Reg. Valves for SG 1B and 1C.

**Answer:** A rise because the discharge pressure of AFW Pump 11 has gone up.

**Exam Bank No.:** 1744

**K/A Catalog Number:** 061 K5.03

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 2.6 **10CFR Reference:** 55.41(b)(5)

Knowledge of the operational implications of the following concepts as they apply to the AFW: Pump head effects when control valve is shut.

**STP Lesson:** LOT 202.28 **Objective Number:** 43808

STATE the function and design bases of the AFWS including major components, instrumentation, and sources of water.

**Reference:** LOT202.28

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank

**Modified from**

**Distractor Justification**

- A: CORRECT: As the AFW Reg Valve to 1A SG is closed, AFW Pump 11's discharge pressure will rise due to the increase in system head. This will create a greater DP across the AFW Reg Valves for SG's 1B and 1C causing their flows to rise.
- B: INCORRECT: The auto recirc valve on AFW Pump 11 will not open because there is still adequate pump flow going to SG's 1B and 1C.
- C: INCORRECT: The auto recirc valve on AFW Pump 11 will not open because there is still adequate pump flow going to SG's 1B and 1C.
- D: INCORRECT: QDPS does provide an automatic control to the AFW Reg Valves, but that control had to have been overridden by the operator to establish the initial conditions given, therefore there will not be any adjustments made to the SG 1B and 1C AFW Reg. Valves from QDPS.

**Question Level:** H **Question Difficulty** 3

**Justification:**

The candidate must have a knowledge of AFW system/component design and operation. This knowledge along with a fundamental knowledge of pump operation and system characteristics must be combined to determine the correct response.

**Exam Bank No.:** 2111

**Last used on an NRC exam:** Never

**RO Sequence Number:** 7

Given the following:

- Unit 1 has shutdown due to a tube leak in Steam Generator (SG) 1B.
- The operating crew is performing the actions of 0POP04-RC-0004, Steam Generator Tube Leakage.
- NO RCP's are in service.
- RCS cooldown and depressurization are in progress.
- RCS Tcold = 500 °F
- RCS Thot = 530 °F
- Core Exit Thermocouples (CET's) = 535 °F

The Primary Reactor Operator has been directed to maintain RCS subcooling between 35 °F and 50 °F during the RCS cooldown and depressurization.

Which one of the below correctly shows the appropriate temperature instrumentation to use to prevent ANY voiding in the RCS AND an RCS pressure range that would satisfy the RCS subcooling requirements based on using the appropriate temperature instrumentation?

	Appropriate RCS Temperature Instrumentation to use	RCS Pressure Range to maintain
A	RCS Thot	1225 - 1360 psig
B	CET's	1225 - 1305 psig
C	CET's	1165 - 1360 psig
D	RCS Thot	1165 - 1305 psig

**Answer:** B CET's; 1225 - 1305 psig

**Exam Bank No.:** 2111

**K/A Catalog Number:** APE 037 AK1.01      **Tier:** 1      **Group/Category:** 2

**RO Importance:** 2.9      **10CFR Reference:** 55.41(b)(14)

Knowledge of the operational implications of the following concepts as they apply to Steam Generator Tube Leak: Use of steam tables.

**STP Lesson:** LOT 102.54      **Objective Number:** N99790

Apply saturated and superheated steam tables in solving liquid-vapor problems.

**Reference:** LOT 102.54, Steam Tables, 0POP04-RC-0004, Rev. 26

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: RCS That should not be used in this instance because this instrument is not representative of the hottest point in the RCS; the point at which saturation will occur first. The pressure band of 1225 - 1360 would satisfy the SCM requirements for the hottest point in the RCS (as measured by CET's).
- B: CORRECT: The CET's should be used in this instance because they are the highest temperature of the RCS and indicate where saturation would occur first if RCS pressure gets too low. The pressure range of 1225 - 1305 psig will maintain SCM within the 35-50 degree band based on CET's.
- C: INCORRECT: Use of CET's is appropriate because they are the highest temperature of the RCS and indicate where saturation would occur first if RCS pressure gets too low. The RCS pressure band of 1165 - 1360 would NOT satisfy minimum SCM requirements, but would satisfy the maximum SCM requirement.
- D: INCORRECT: RCS That should not be used in this instance because this instrument is not representative of the hottest point in the RCS; the point at which saturation will occur first. The RCS pressure band of 1165 - 1305 psig would meet the SCM requirements if That were used.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

Student must be able to use steam tables to determine the allowable RCS pressure band based on the given information. Also, he/she must know to use CET's in this instance because they are the highest temperature of the RCS and indicate where saturation would occur first if RCS pressure gets too low.

**Exam Bank No.:** 898**Last used on an NRC exam:** Never**RO Sequence Number:** 8

Given the following:

- Unit 1 is operating at 100% power.
- CCW Pump 'A' is running and its control is selected to RUN.
- CCW Pump 'B' is NOT running and its control is selected to STANDBY.
- CCW Pump 'C' is NOT running and its control is selected to OFF.

A lockout on Unit 1 Standby Transformer de-energizes it.

Which one of the following correctly describes the design response of the CCW system?

	CCW Pump 'A'	CCW Pump 'B'	CCW Pump 'C'
A	Continues to run; normal bus power source has NOT been lost	Starts from Sequencer on ESF DG due to loss of normal bus power source	Does NOT start
B	Stopped by Sequencer, then re-started by Sequencer on ESF DG due to loss of normal bus power source	Starts on low CCW header pressure	Does NOT start
C	Continues to run; normal bus power source has NOT been lost	Starts on low CCW header pressure	Starts from Sequencer on ESF DG due to loss of normal bus power source
D	Continues to run; normal bus power source has NOT been lost	Starts from Sequencer on ESF DG due to loss of normal bus power source	Starts from Sequencer on ESF DG due to loss of normal bus power source

**Answer:** A Continues to run; normal bus power source has NOT been lost; Starts from Sequencer on ESF DG due to loss of normal bus power source; Does NOT start



**Exam Bank No.:** 898

**K/A Catalog Number:** 008K2.02

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 3.0 **10CFR Reference:** 55.41(b)(5)

Knowledge of the bus power supplies to the following: CCW pump, including emergency backup.

**STP Lesson:** LOT 201.12 **Objective Number:** 5213

Given a Plant or system condition, PREDICT the operation of the Component Cooling Water System

**Reference:** LOT 201.12

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank

**Modified from**

**Distractor Justification**

- A: CORRECT: The Standby Transformer normally only supplies the 'B' Train ESF distribution during normal operations. Therefore, the A and C CCW trains are unaffected by the power loss (remain in the same condition as originally given) and B CCW pump will be sequenced on to the 'B' Train ESF DG.
- B: INCORRECT: 'A' CCW train has not lost power because it's received from the U1 Aux Transformer, not the Standby Transformer. Because 'A' CCW continues to run, there is not a low CCW header pressure. Additionally, 'B' CCW Train has lost power due to the loss of the Standby Transformer and will be started by the Train Sequencer. 'C' CCW Pump does not start as stated in the distracter.
- C: INCORRECT: 'A' CCW Pump continues to run as stated. 'B' Train CCW Pump WILL start, but due to a loss of power to its ESF Train, not because there is low CCW header pressure since CCW pump 'A' continues to run.. 'C' CCW pump will NOT start because it's Train has not lost power.
- D: INCORRECT: 'A' CCW Pump continues to run as stated. 'B' CCW Pump starts from its Sequencer as stated, but 'C' CCW Pump does NOT start because it's Train has not lost power.

**Question Level:** H

**Question Difficulty** 3

**Justification:**

Student must determine how the loss of the Standby Transformer affects the operation of the CCW relative to the given conditions.

**Exam Bank No.:** 2097

**Last used on an NRC exam:** Never

**RO Sequence Number:** 9

Given the following:

- Unit 2 is operating at 100% power.
- All systems are aligned for normal operation.
- A leak in the CCW system develops causing CCW Surge Tank level to lower.
- CCW Surge Tank level is currently at 63%.

Which one of the following correctly describes the CCW System response and the reason it's important to maintain CCW flow to the RCP's?

Based on the given conditions, CCW flow \_\_\_\_\_ been isolated to the RCP's. Maintaining CCW flow to the RCP's is important to prevent damage to the \_\_\_\_\_ of any operating RCP.

	CCW Flow Status	Potential RCP damage
A	HAS	Thermal barrier
B	has NOT	Motor bearings
C	has NOT	Thermal Barrier
D	HAS	Motor bearings

**Answer:** B has NOT; Motor bearings

**Exam Bank No.:** 2097

**K/A Catalog Number:** APE 015/017AK3.01      **Tier:** 1      **Group/Category:** 1

**RO Importance:** 2.5      **10CFR Reference:** 55.41(b)(7)

Knowledge of the reasons for the following responses as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): Potential damage from high winding and/or bearing temperatures.

**STP Lesson:** LOT 201.05      **Objective Number:** 97119

Given plant conditions, ANALYZE the conditions and accurately PREDICT Reactor Coolant Pump response.

**Reference:** LOT 201.05, LOT 201.12

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified from**

**Distractor Justification**

- A: INCORRECT: CCW flow has NOT yet been isolated to the RCP's. Additionally, the RCP Thermal Barriers are not at risk for damage because their CCW cooling is only important if normal seal injection flow is lost.
- B: CORRECT: A Surge Tank level of 63% is below the 'first level isolation' so CCW flow has been isolated to some components, but not the RCP's. If CCW Surge Tank level continued to lower, CCW flow to the RCP's would be isolated at a level of 61.5%. If it is isolated and the RCP continues to run, the motor bearings will be damaged due to the loss of cooling.
- C: INCORRECT: CCW flow has not been isolated to the RCP's, as stated. However, the RCP Thermal Barriers are not at risk for damage because their CCW cooling is only important if normal seal injection flow is lost.
- D: INCORRECT: CCW flow has NOT yet been isolated to the RCP's. If it is isolated and the RCP continues to run, the motor bearings will be damaged due to the loss of cooling.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

Students must be able to determine how the CCW system has been affected based on the current plant conditions and have knowledge of the RCP components that could be potentially damaged if CCW is lost.

**Exam Bank No.:** 67

**Last used on an NRC exam:** 2001

**RO Sequence Number:** 10

Given the following:

- Unit 1 is currently operating at 75% power.
- Power is being raised at 10% per hour.
- Condensate pump #12 is out of service for maintenance

Condensate Pump #11 trips from an unknown cause.

Which one of the following correctly describes the plant response and appropriate action per OPOP04-CD-0001, Loss of Condensate Flow?

Deaerator level will...

- A. RISE. Stop raising power and stabilize Deaerator level at the present power level.
- B. RISE. Continue raising power while attempting to start an additional Condensate Pump.
- C. LOWER. Perform a rapid load reduction to less than 50% Reactor power.
- D. LOWER. Immediately trip the turbine and stabilize Deaerator level at no load conditions.

**Answer:** C LOWER. Perform a rapid load reduction to less than 50% Reactor power.

**Exam Bank No.:** 67

**K/A Catalog Number:** 056 A2.04

**Tier:** 2 **Group/Category:** 2

**RO Importance:** 2.6 **10CFR Reference:** 55.41(b)(10)

Ability to (a) predict the impacts of the following malfunctions or operations on the Condensate System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of condensate pumps.

**STP Lesson:** LOT 202.10 **Objective Number:** 40606

Given plant/system conditions, PREDICT the operation of the Condensate System.

**Reference:** LOT 202.10, OPOP04-CD-0001, Rev. 11

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank

**Modified from**

**Distractor Justification**

- A: INCORRECT - DA level will lower, not rise as indicated. Additionally, one pump will not provide sufficient flow to maintain 75% power. Power must be lowered.
- B: INCORRECT - DA level will lower, not rise as indicated. Additionally, one pump will not provide sufficient flow for the current power level much less a higher one.
- C: CORRECT - DA level will lower as indicated. Per OPOP04-CD-0001, with 2 pumps required and only 1 available, a power decrease is started.
- D: INCORRECT - The DA level will lower as indicated, but the Off Normal procedure does not direct the operator to immediately trip the turbine. A Reactor trip would be required if deaerator level cannot be maintained greater than 30%. The initial operator response is to perform a rapid load reduction.

**Question Level:** H **Question Difficulty** 3

**Justification:**

The candidate must determine how the DA level is affected by the trip of the condensate pump. Additionally, he/she must realize that one condensate pump will not maintain the current power level and a power reduction is necessary.

**Exam Bank No.:** 2084

**Last used on an NRC exam:** Never

**RO Sequence Number:** 11

Given the following:

- Unit 1 has just experienced a Reactor/Turbine trip due to Loss of Offsite Power (LOOP).
- All ESF DG's and Sequencers have performed as designed.
- The crew is performing the actions of 0POP05-EO-ES02, Natural Circulation Cooldown.

Which one of the below correctly describes operation of the CRDM Ventilation Fans AFTER the Sequencers have completed their actions?

The CRDM Ventilation Fans are...

- A. RUNNING. They should be kept in service to prevent damage to the CRDM coils.
- B. RUNNING. They should be kept in service to help prevent void formation in the Reactor Vessel Upper head.
- C. NOT running. They should be placed in service to prevent damage to the CRDM coils.
- D. NOT running. They should be placed in service to help prevent void formation in the Reactor Vessel Upper head.

**Answer:** D NOT running. They should be placed in service to help prevent void formation in the Reactor Vessel Upper head.

**Exam Bank No.:** 2084

**K/A Catalog Number:** 022 K4.04

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 2.8 **10CFR Reference:** 55.41(b)(5)

Knowledge of CCS design feature(s) and/or interlock(s) which provide for the following: Cooling of Control Rod Drive Mechanisms.

**STP Lesson:** LOT 504.25 **Objective Number:** 92234

Given a copy of a step from 0POP05-EO-ES02, STATE/IDENTIFY how the action is performed and the basis for the action to include the action itself, its purpose and the result.

**Reference:** 0POP05-EO-ES02, Rev. 12, LOT 504.25

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: The CRDM Vent Fans do not automatically restart following a loss of power to their MCC therefore they will NOT be running. Also, under the given conditions, the reactor has been tripped thus the CRDM coils are de-energized and do not require the CRDM Vent Fans to be running for heat removal.
- B: INCORRECT: The CRDM Vent Fans do not automatically restart following a loss of power to their MCC therefore they will NOT be running. They do help cool the RV head to help prevent void formation during a nat. circ cooldown when in service.
- C: INCORRECT: The CRDM Vent Fans do not automatically restart following a loss of power to their MCC therefore they will not be running as stated. However, under the given conditions, the reactor has been tripped thus the CRDM coils are de-energized and do not require the CRDM Vent Fans to be running for heat removal.
- D: CORRECT: The CRDM Vent Fans do not automatically restart following a loss of power to their MCC. During a natural circulation cooldown, they help cool the Reactor Vessel head to help prevent void formation in that location.

**Question Level:** F **Question Difficulty** 3

**Justification:**

Student must know the importance of the CRDM Vent fans during a natural circulation cooldown and the features of their control circuitry.

**Exam Bank No.:** 1693

**Last used on an NRC exam:** 2007

**RO Sequence Number:** 12

Given the following:

- A Large Break LOCA has occurred on Unit 1
- All equipment operated as designed.

If a Containment Spray Pump trips, the result would be ...

- A. a higher Containment water level.
- B. RCB pressure will exceed design pressure.
- C. RCFC inlet air temperatures will rise.
- D. Containment Hydrogen concentration will rise.

**Answer:** C RCFC inlet air temperatures will rise.



**Exam Bank No.:** 1693

**K/A Catalog Number:** 026 K3.01

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 3.9 **10CFR Reference:** 55.41(b)(5)

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

**STP Lesson:** LOT 201.11 **Objective Number:** 5001

STATE the function of the Containment Spray System, major components, controls, and/or instrumentation.

**Reference:** Principles of Heat Transfer

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank

**Modified from**

**Distractor Justification**

- A: INCORRECT - the Containment Spray pumps take a suction on the RWST as do the SI Pumps. The available volume of the RWST will be pumped into the Containment by a combination of CS and SI pumps. The only difference for one CS Pump not running is the time it would take to pump the RWST available volume into Containment.
- B: INCORRECT - the minimum Containment cooling required is 2 Containment Spray Pumps and 3 RCFC's. With the given conditions, there is at least this amount of equipment in operation.
- C: CORRECT - With the loss of a Containment Spray Pump, the heat removal in Containment has been reduced resulting in higher Containment pressure and temperatures. This will raise the air temperature going into the RCFC's as they work to transfer more energy.
- D: INCORRECT - Containment Spray does not control Containment Hydrogen

**Question Level:** F **Question Difficulty** 3

**Justification:**

The student must have a knowledge of how the RCFCs and containment spray systems function together in a post-LOCA environment.

**Exam Bank No.:** 2078

**Last used on an NRC exam:** Never

**RO Sequence Number:** 13

Given the following:

- Unit 1 is operating at 100% power.
- Centrifugal Charging Pump (CCP) 1A is in service.

Which one of the following correctly describes the operation of CCP 1A following a Safety Injection (SI) actuation?

If an SI actuation occurs, CCP 1A will...

- A. trip because VCT Outlet Valves MOV-0113A and MOV-0112B close on an SI signal.
- B. continue to run because VCT Outlet Valves MOV-0113A and MOV-0112B open on an SI signal.
- C. trip because RWST-to-CCP Suction Valves MOV-0112C and MOV-0113B close on an SI signal.
- D. continue to run because RWST-to-CCP Suction Valves MOV-0112C and MOV-0113B open on an SI signal.

**Answer:** D continue to run because RSWT-to-CCP Suction Valves MOV-0112C and MOV-0113B open on an SI signal.

**Exam Bank No.:** 2078

**K/A Catalog Number:** 004 K1.15

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 3.8 **10CFR Reference:** 55.41(b)(7)

Knowledge of the physical connections and/or cause-effect relationships between the CVCS and the following: ECCS.

**STP Lesson:** LOT 201.06 **Objective Number:** 507226

Given a description of plant conditions, ANALYZE the conditions and PREDICT how the CVCS will respond

**Reference:** LOT 201.06

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: the CCP's will not trip on an SI because they will be provided a suction from the RWST. It's true the VCT outlet valves will close, but it's also true the suction valves from the RWST to the CCP's will open, therefore the CCP's are not designed to trip on an SI.
- B: INCORRECT: The VCT outlet valves are signaled to close on an SI, not open. The CCP's will not trip however because the RWST supply valves to the CCP's open on an SI.
- C: INCORRECT: the CCP's will not trip on an SI because they will be provided a suction from the RWST. The suction valves from the RWST to the CCP's will open, not close on an SI.
- D: CORRECT: The RWST suction supply valves to the CCP's will open on an SI to ensure a suction source to the pumps. The VCT outlet valves will close to isolate the VCT from the CCP's.

**Question Level:** F **Question Difficulty** 3

**Justification:**

Student must know how the CVCS and ECCS (RWST valves) respond to a Safety Injection.

**Exam Bank No.:** 2080

**Last used on an NRC exam:** Never

**RO Sequence Number:** 14

Given the following:

- Unit 2 is operating at 100% power.
- All systems are in a normal lineup.
- The operator has just adjusted VCT pressure.
- #1 seal leakoff on the RCP's are:
  - RCP 2A: 5.4 gpm.
  - RCP 2B: 3.3 gpm
  - RCP 2C: 3.5 gpm
  - RCP 2D: 4 gpm

Based on the attached addendum, ALL RCP #1 seal leakoff flows are ...

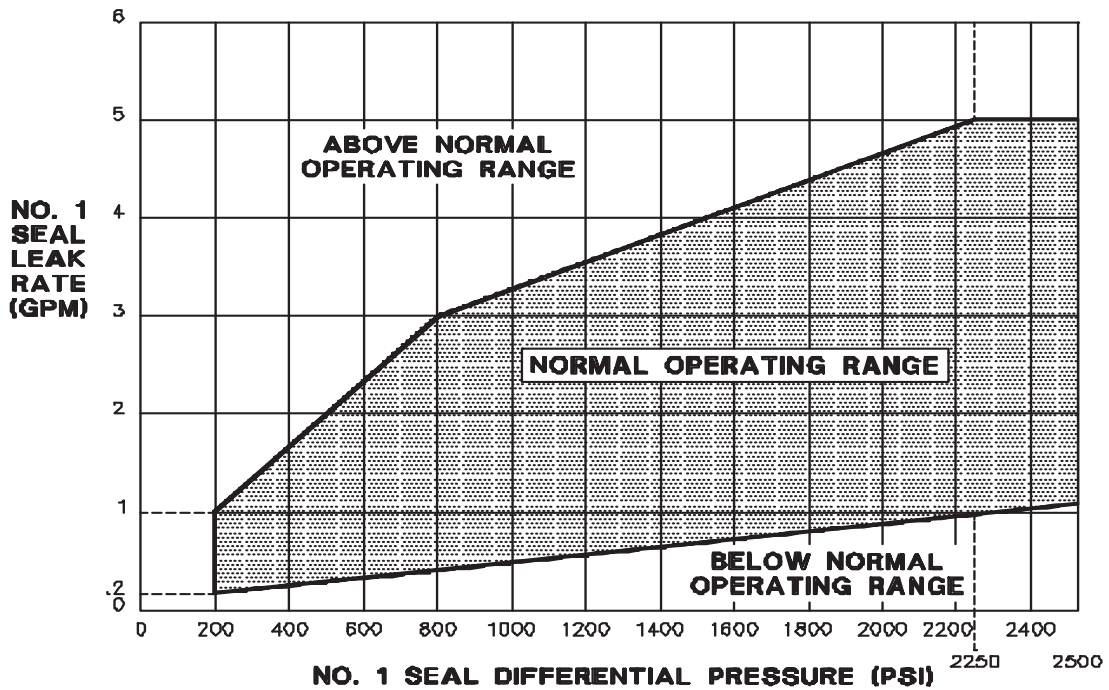
- A. within the normal operating range. The operator could RAISE VCT pressure to lower seal leakoff flows.
- B. NOT within the normal operating range. The operator could RAISE VCT pressure to lower seal leakoff flows.
- C. within the normal operating range. The operator could LOWER VCT pressure to lower seal leakoff flows.
- D. NOT within the normal operating range. The operator could LOWER VCT pressure to lower seal leakoff flows.

**Answer:** B NOT within the normal operating range. The operator could RAISE VCT pressure to lower seal leakoff flows.

**NOTE**

WHEN RCP Number 1 Seal DP indicator is off scale high, THEN Number 1 Seal DP SHALL be approximated to be RCS pressure minus VCT pressure.

**NO. 1 SEAL NORMAL OPERATING RANGE**



STP G-0779

This Procedure is Applicable in ALL Modes

**Exam Bank No.:** 2080

**K/A Catalog Number:** 003 A2.05

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 2.5 **10CFR Reference:** 55.41(b)(10)

Ability to (a) predict the impacts of the following malfunctions or operations on the RCPS and (b) based on those conditions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Effects of VCT pressure on RCP seal leakoff flows.

**STP Lesson:** LOT 201.05 **Objective Number:** 50805

DESCRIBE the operation of the RCP seals and seal water supply including all design limits and their bases.

**Reference:** LOT 201.05, OPOP04-RC-0002, Rev. 28

**Attached Reference**  **Attachment:** OPOP04-RC-0002, Addendum 2, pg. 1 of 1

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: Per the provided reference, RCP 2A seal leakoff is outside the normal range. Raising VCT pressure will lower seal seal leakoff as stated.
- B: CORRECT: Per the provided reference, RCP 2A seal leakoff is outside the normal range. Raising VCT pressure will lower seal seal leakoff as stated.
- C: INCORRECT: Per the provided reference, RCP 2A seal leakoff is outside the normal range. However, lowering VCT pressure would raise the seal leakoff, not lower it.
- D: INCORRECT: Per the provided reference, RCP 2A seal leakoff is outside the normal range as stated, but lowering VCT pressure would raise the seal leakoff, not lower it.

**Question Level:** H **Question Difficulty** 3

**Justification:**

Student must be able to determine if seal parameters are within limits using the reference provided. Additionally, he/she must be able to determine the cause/effect between VCT pressure and #1 seal DP.

**Exam Bank No.:** 1180

**Last used on an NRC exam:** Never

**RO Sequence Number:** 15

Given the following:

- Unit 1 is operating at 75% power, steady state.
- All systems are functioning in their normal lineup EXCEPT Rod Control is in MANUAL.

Assuming no operator action, which one of the below correctly describes the effect on RCP seal injection flow if RCS Loop 2 Tcold instrument failed HIGH?

RCP seal injection flow would...

- A LOWER due to the change in PZR Program level.
- B NOT change because ACTUAL Tave has not changed.
- C RISE because charging flow is now higher.
- D NOT change because RCP seal injection flow is dependent on the positioning of manual hand control valve, HCV-0218.

**Answer:** A LOWER due to the change in PZR Program level.

**Exam Bank No.:** 1180

**K/A Catalog Number:** 004 A4.11

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 3.4 **10CFR Reference:** 55.41(b)(7)

Ability to manually operate and/or monitor in the control room:RCP seal injection.

**STP Lesson:** LOT 201.06 **Objective Number:** 507226

Given a description of plant conditions, ANALYZE the conditions and PREDICT how the CVCS will respond

**Reference:** LOT 201.06, LOT 201.14

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank

**Modified from**

**Distractor Justification**

- A: CORRECT: The failed Tcold instrument will cause the Tave signal to be high for that RCS Loop. The pressurizer level control system uses auctioneered high Tave to generate a program level for the pressurizer. The loop with the failed Tcold instrument will result in the highest Tave signal causing the program level to be too high. In response to the elevated program level signal, charging flow will rise because actual level now appears to be less than program. As charging flow rises, charging header pressure lowers resulting in a lower seal injection flow.
- B: INCORRECT: Seal injection flow WILL change as described above even though actual Tave has not changed.
- C: INCORRECT: seal injection flow has gone DOWN because charging flow is higher.
- D: INCORRECT: Seal injection flow WILL change as described above even though the manual hand control valve has not been adjusted.

**Question Level:** H **Question Difficulty** 3

**Justification:**

Student must be able to evaluate the failed temperature channel to determine its effect on RCP seal injection.



**Exam Bank No.:** 2095**Last used on an NRC exam:** Never**RO Sequence Number:** 16

Given the following:

- Unit 2 Reactor has tripped from 100% power.
- The crew is performing the actions of 0POP05-EO-EO00, Reactor Trip or Safety Injection.
- The Charging Line OCIV, MOV-0025, cannot be opened from the Control Room.

Which one of the below correctly describes the location of MOV-0025 AND the operator action to open the valve using the manual handwheel?

MOV-0025 is located in the MAB \_\_\_\_\_. To manually operate MOV-0025 locally, the operator must engage the handwheel by \_\_\_\_\_

	Location of MOV-0025	Action to use local handwheel
A	10' Charging Pump Room 033	depressing the clutch lever while turning the handwheel.
B	29' Radioactive Pipe Penetration Room 108C	pushing the handwheel inward while rotating it.
C	10' Charging Pump Room 033	pushing the handwheel inward while rotating it.
D	29' Radioactive Pipe Penetration Room 108C	depressing the clutch lever while rotating the handwheel.

**Answer:** D 29' Radioactive Pipe  
Penetration Room 108Cdepressing the clutch lever while rotating the  
handwheel.

**Exam Bank No.:** 2095

**K/A Catalog Number:** EPE 007 G2.1.30      **Tier:** 1      **Group/Category:** 1

**RO Importance:** 4.4      **10CFR Reference:** 55.41(b)(10)

Ability to locate and operate components, including local controls.

**STP Lesson:** LOT 105.05      **Objective Number:** N99943

Describe the operation of the manual declutch lever on a typical motor-operated valve.

**Reference:** OPOP05-EO-EO00, Rev. 21, LOT 105.05

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified from**

**Distractor Justification**

- A: INCORRECT: incorrect location, but correct action.
- B: INCORRECT: correct location, but incorrect action.
- C: INCORRECT: incorrect location and action.
- D: CORRECT: correct location and actions for manual operation.

**Question Level:** F      **Question Difficulty** 2

**Justification:**

Student must know where MOV-0025 is located and how to operate an MOV manually.

**Exam Bank No.:** 2113

**Last used on an NRC exam:** Never

**RO Sequence Number:** 17

Given the following:

- Unit 1 is in Mode 3 performing a plant cooldown for refueling.
- Pressurizer pressure = 2100 psig.
- Pressurizer level = 25%.
- RCS temperature = 540 °F.

Subsequently, a Small Break Loss of Coolant (SBLOCA) occurs:

- Pressurizer Pressure is lowering at 50 psig/minute.
- Pressurizer Level is lowering at 2%/minute.

Which one of the following correctly describes what the operator would observe on CVCS Letdown if NO operator action were taken?

The FIRST valve/s to close and isolate Letdown would be...

- A. LETDN ORIF HDR ISOL, FV-0011 on low Pressurizer LEVEL because there is a 10 second time delay on closure of LCV-465/468 to allow FV-0011 to close first.
- B. LETDN ISOL LCV-0465/0468 on low Pressurizer LEVEL because there is a 10 second time delay on closure of FV-0011 to allow LCV-465/468 to close first.
- C. LETDN ORIF HDR ISOL, FV-0011 on low Pressurizer PRESSURE SI because there is a 10 second time delay on closure of LCV-465/468 to allow FV-0011 to close first.
- D. LETDN ISOL LCV-0465/0468 on low Pressurizer PRESSURE SI because there is a 10 second time delay on closure of FV-0011 to allow LCV-465/468 to close first.

**Answer:** A LETDN ORIF HDR ISOL, FV-0011 on low Pressurizer LEVEL because there is a 10 second time delay on closure of LCV-465/468 to allow FV-0011 to close first.

**Exam Bank No.:** 2113

**K/A Catalog Number:** EPE 009 EA2.08      **Tier:** 1      **Group/Category:** 1

**RO Importance:** 2.9      **10CFR Reference:** 55.41(b)(5)

Ability to determine or interpret the following as they apply to a small break LOCA: Letdown isolation valve position indication.

**STP Lesson:** LOT 201.06      **Objective Number:** 507226

Given a description of plant conditions, ANALYZE the conditions and PREDICT how the Chemical and Volume Control System will respond.

**Reference:** LOT 201.06

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified from**

**Distractor Justification**

- A: CORRECT: FV-0011 will automatically close on either an SI (Phase 'A') or low pressurizer level. Pressurizer level will reach its setting for isolation before Pressurizer pressure. Additionally, there is a 10 second delay on LCV=0465/0468 after a low Pressurizer level condition occurs to allow for the closure of FV-0011.
- B: INCORRECT: LCV-0465/468 will auto close on low pressurizer level, however they have a 10 second time delay after the low Pressurizer level condition occurs to allow closure of FV-0011 so they will not be the first valves to close.
- C: INCORRECT: FV-0011 will automatically close on either an SI (Phase 'A') or low pressurizer level. Pressurizer level will reach its setpoint before pressurizer pressure so FV-0011 will close on the low pressurizer level condition first.
- D: INCORRECT: LCV-0465/468 will auto close on low pressurizer level only, therefore they would not respond to an SI/Phase 'A' Isolation if they were present. Additionally, there is a 10 second delay on LCV=0465/0468 after a low Pressurizer level condition occurs to allow for the closure of FV-0011.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

Student must be able to determine which letdown isolation will occur first based on the given plant conditions.

**Exam Bank No.:** 1474

**Last used on an NRC exam:** Never

**RO Sequence Number:** 18

An air leak on ESF Diesel Generator #12 requires isolating one of the starting air receivers. With the outlet isolation for the air receiver closed (assume no other valve manipulations), a start signal for Diesel Generator #12 will result in:

- A. ONLY HALF the cylinders receiving starting air. Engine acceleration to full speed will be <10 seconds.
- B. ONLY HALF the cylinders receiving starting air. Engine acceleration to full speed will be >10 seconds.
- C. ALL cylinders receiving starting air. Engine acceleration to full speed will be <10 seconds.
- D. ALL cylinders receiving starting air. Engine acceleration to full speed will be >10 seconds.

**Answer:** C ALL cylinders receiving starting air. Engine acceleration to full speed will be <10 seconds.

**Exam Bank No.:** 1474

**K/A Catalog Number:** 064 K6.07

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 2.7 **10CFR Reference:** 55.41(b)(7)

Knowledge of the effect of a loss or malfunction of the following will have on the ED/G System: Air Receivers.

**STP Lesson:** LOT 201.39 **Objective Number:** 98476

Given a plant condition and/or various diesel modes of operation, PREDICT the response of the emergency diesels.

**Reference:** LOT 201.39

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank

**Modified from**

**Distractor Justification**

- A: INCORRECT: The air compressors and receivers are redundant systems thus each is designed to perform the design function. Therefore all cylinders will receive starting air and the ESF DG will start within 10 sec.
- B: INCORRECT: The air compressors and receivers are redundant systems thus each is designed to perform the design function. Therefore all cylinders will receive starting air and the ESF DG will start within 10 sec.
- C: CORRECT: A loss of one of two redundant air receivers will not impact the design performance of the ESF DG.
- D: INCORRECT: All cylinders will receive starting air, as stated, however, the loss of one air receiver will not impact the design starting ability of the ESF DG's therefore, #12 ESF DG will still start within 10 sec.

**Question Level:** F **Question Difficulty** 3

**Justification:**

Student must know the design of the ESF DG starting air system.

**Exam Bank No.:** 1647

**Last used on an NRC exam:** 2007

**RO Sequence Number:** 19

Given the following:

- Unit 1 is operating at full power.
- 4160V Bus E1C loses power.
- Immediately after the loss of power, an operator notes the following indications:
  - #13 Diesel Generator Blue, READY FOR LD, light is LIT (8 seconds after the power loss).
  - 4160V Bus E1C voltage = 4160 volts (9 seconds after the power loss).
  - Indicating lights for 'C' ECW Pump show the Red light OUT, Green light ON (9 seconds after the power loss).
  - Indicating lights for 'C' ECW Pump Discharge Valve show the Red light OUT, Green light OUT (9 seconds after the power loss).

These indications are:

- A. Expected at this time. The operator should ensure the Sequencer shortly re-energizes the 480 VAC MCC's to provide power to the 'C' ECW Pump Discharge Valve, and starts the 'C' ECW Pump.
- B. Expected at this time. The operator should ensure the Sequencer automatically starts the 'C' ECW Pump to provide cooling flow to the Diesel Generator. The Discharge Valve for 'C' ECW Pump is normally open.
- C. NOT expected at this time. The operator should manually start the 'C' Train ECW Pump and dispatch a plant operator to manually open the 'C' ECW Pump Discharge Valve.
- D. NOT expected at this time. The operator should manually start the 'C' Train ECW Pump. The Discharge Valve for 'C' ECW Pump is normally open.

**Answer:** A Expected at this time. The operator should ensure the Sequencer shortly re-energizes the 480 VAC MCC's, to provide power to the 'C' ECW Pump Discharge Valve, and starts the 'C' ECW Pump.

**Exam Bank No.:** 1647

**K/A Catalog Number:** APE 062 AA1.02      **Tier:** 1      **Group/Category:** 1

**RO Importance:** 3.2      **10CFR Reference:** 55.41(b)(7)

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.

**STP Lesson:** LOT 201.13      **Objective Number:** 91201

GIVEN a plant or system condition, PREDICT the operation of the Essential Cooling Water System.

**Reference:** LOT201.22

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank      **Modified from**

**Distractor Justification**

- A: CORRECT - on a LOOP signal the 4160 v bus is stripped including cascading 480 VAC MCC's that supply MOV's. Once the DG connects to the bus, the Sequencer will reload the bus beginning with the 480 VAC MCC's and subsequently the 'C' ECW Pump. The Discharge Valve will automatically open after pump start.
- B: INCORRECT - 'C' ECW Pump Discharge Valve is normally closed. Valve automatically opens following pump start.
- C: INCORRECT - indications show a normal condition shortly after the Diesel Generator connects to the bus, but before the Sequencer has begun loading.
- D: INCORRECT - indications show a normal condition shortly after the Diesel Generator connects to the bus, but before the Sequencer has begun loading. The 'C' ECW Pump Discharge Valve automatically opens following pump start.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

The applicant must understand the sequence of events that occur during a LOOP and apply that knowledge to the given conditions to determine if this is expected. A knowledge of the normal operation for the ECW system is also required.



**Exam Bank No.:** 2106

**Last used on an NRC exam:** Never

**RO Sequence Number:** 20

Given the following:

- Units 1 and 2 are operating at 100% power.
- All systems are in their normal lineup for the current power level.
- An electrical disturbance causes the loss of the Switchyard SOUTH BUS.

Which one of the below correctly describes the operational status of the ESF Diesel Generators (DG's) in Units 1 and 2?

The loss of the South Bus has caused...

- A. NO ESF DG's in either Unit to start.
- B. ONLY ESF DG #12 to start.
- C. ESF DG's #12 AND #22 to start.
- D. ONLY ESF DG #22 to start.

**Answer:** D ONLY ESF DG #22 to start.

**Exam Bank No.:** 2106

**K/A Catalog Number:** APE 077 AA2.09      **Tier:** 1      **Group/Category:** 1

**RO Importance:** 3.9      **10CFR Reference:** 55.41(b)(7)

Ability to determine and interpret the following as they apply to Generator, Voltage and Electric Grid Disturbances: Operational status of emergency diesel generators.

**STP Lesson:** LOT 204.01      **Objective Number:** 20401

Given plant or system conditions, PREDICT the response of the plant and/or systems.

**Reference:** LOT 201.30

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified from**

**Distractor Justification**

- A: INCORRECT: This would be true if none of the 4160 v ESF buses received their normal power from the Switchyard south bus. However, one 4160v Bus in each unit receives normal power from a Standby Bus that is powered from the Switchyard north/south buses via the Units' Standby Transformer. In Unit 2, it's the South Bus that supplies that unit's Standby Transformer.
- B: INCORRECT: #12 ESF DG will NOT start because it's related 4160V ESF Bus ultimately receives its power from the north bus, not the south bus.
- C: INCORRECT: ONLY ESF DG #22 starts because its related 4160v ESF Bus ultimately receives its power from the south bus.
- D: CORRECT: The south bus provides power to the #2 Standby Transformer. This transformer is the normal supply to 13.8 kV Bus 'G' in Unit 2 which supplies normal power to 4160v Bus E2B. When this power is lost, the associated ESF DG (#22) will start and automatically load Bus E2B.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

Student must use his/her knowledge of the electrical distribution and lineup, in both units, to determine how the ESF DG's in both units are affected upon losing a particular power source.

**Exam Bank No.:** 2074**Last used on an NRC exam:** Never**RO Sequence Number:** 21

Which one of the below correctly describes features of the Hydrogen Analyzer System used during post-accident conditions?

	Operating Principle is based on measuring...	Placed in service during post-accident conditions from the...	Indication is provided by:
A	isotopic content of gas mixture.	Control Room	CP-002 meter
B	thermal conductivity of gas mixture.	Local Analyzer Panels	QDPS
C	isotopic content of gas mixture.	Local Analyzer Panels	CP-002 meter
D	thermal conductivity of gas mixture.	Control Room	QDPS

**Answer:** D thermal conductivity of gas mixture; Control Room; QDPS

**Exam Bank No.:** 2074

**K/A Catalog Number:** 028 A4.03

**Tier:** 2 **Group/Category:** 2

**RO Importance:** 3.1 **10CFR Reference:** 55.41(b)(7)

Ability to manually operate and/or monitor in the control room: Location and operation of hydrogen sampling and analysis of containment atmosphere, including alarms and indication.

**STP Lesson:** LOT 201.27 **Objective Number:** 29909

DESCRIBE the method used to detect hydrogen.

**Reference:** LOT 201.27

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: The H2 Analyzers are placed in service from the Control Room, as stated in this distracter, however they do NOT use isotopic analysis to determine H2 concentration and do NOT have meter indication on CP-002.
- B: INCORRECT: The H2 Analyzers measure thermal conductivity of the gas mixture, as stated in this distracter. Also, they provide indication to the QDPS as stated. However, they are placed in service from the Control Room, not the local panels.
- C: INCORRECT: The H2 Analyzers do NOT use isotopic analysis to determine H2 concentration as stated, nor are they placed in service from the local panels. They do however indicate on the QDPS.
- D: CORRECT: The H2 Analyzers use a conductivity difference as measured by temperature detectors to determine H2 concentration. They are placed in service from the Control Room and provide indication on the QDPS.

**Question Level:** F **Question Difficulty** 3

**Justification:**

The student must know the location of the Hydrogen Analyzers and their principle of operation.

**Exam Bank No.:** 2089

**Last used on an NRC exam:** Never

**RO Sequence Number:** 22

Given the following:

- A liquid release is in progress from Waste Monitor Tank 1A.
- Liquid Radwaste Rad Monitor RT-8038 has exceeded its ALERT and HIGH settings.
- The Liquid Radwaste release is still in progress.

Which one of the following correctly describes how the release should have been stopped?

The Liquid Radwaste release should have already been stopped...

- A. by automatic action from RT-8038 at the ALERT setting.
- B. by automatic action from RT-8038 at the HIGH setting.
- C. manually by the operator at the ALERT setting because RT-8038 does not have any automatic control features.
- D. manually by the operator at the HIGH setting because RT-8038 does not have any automatic control features.

**Answer:** B by automatic action from RT-8038 at the HIGH setting.

**Exam Bank No.:** 2089

**K/A Catalog Number:** 059 AK2.01      **Tier:** 1      **Group/Category:** 2

**RO Importance:** 2.7      **10CFR Reference:** 55.41(b)(13)

Knowledge of the interrelationships between the Accidental Liquid Radwaste Release and the following:  
Radioactive-liquid monitors.

**STP Lesson:** LOT 202.41      **Objective Number:** 92122

LIST THE INITIATING CONDITION AND RESULTANT AUTOMATIC ACTION FOR THE PERMS ASSOCIATED WITH THE FOLLOWING SYSTEMS:

- A. BRS, B. GWPS, C. LWPS
- D. TGB SUMP, E. CPS, F. SGBD
- G. CTMT BLDG, H. EAB/CRE HAVC
- I. FHB HVAC

**Reference:** LOT 202.41

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: There is no automatic action that will occur at the ALERT alarm setting.
- B: CORRECT: RT-8038 should act to divert the liquid release back to a Waste Monitor Tank if the HIGH alarm setting is reached.
- C: INCORRECT: The release is not required to be stopped until the HIGH alarm setting is reached on RT-8038. When that occurs, RT-8038 should automatically stop the release so no operator action should be required.
- D: INCORRECT: RT-8038 should act to divert the liquid release back to a Waste Monitor Tank if the HIGH alarm setting is reached. No operator action should be required.

**Question Level:** F      **Question Difficulty** 2

**Justification:**

Student must know the automatic actions of the Process Rad Monitors and under what conditions they will occur.

**Exam Bank No.:** 551

**Last used on an NRC exam:** 1995

**RO Sequence Number:** 23

A waste gas release is in progress when RT-8032, GWPS Outlet Radiation Monitor, exceeds the HIGH alarm setpoint.

Which one of the below correctly describes how the release will be terminated?

The...

- A. Waste Gas Compressor trips.
- B. MAB Main Exhaust fans trip.
- C. GWPS inlet header valve FV-4657 shifts to the 'RECIRC' position.
- D. GWPS discharge flow valve FV-4671 closes.

**Answer:** D GWPS discharge flow valve FV-4671 closes.

**Exam Bank No.:** 551

**K/A Catalog Number:** 073 K4.01

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 4.0 **10CFR Reference:** 55.41(b)(11)

Knowledge of PRM system design feature(s) and/or interlock(s) which provide for the following: Release termination when radiation exceeds setpoint.

**STP Lesson:** LOT 202.41 **Objective Number:** 33243

LIST THE INITIATING CONDITION AND RESULTANT AUTOMATIC ACTION FOR THE PERMS ASSOCIATED WITH THE FOLLOWING SYSTEMS:

- A. BRS B. GWPS C. LWPS
- D. TGB SUMP E. CPS F. SGBD
- G. CTMT BLDG H. EAB/CRE HAVC
- I. FHB HVAC

**Reference:** LOT203.14, 0POP04-RA-0001, Rev 26

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank

**Modified from**

**Distractor Justification**

- A: INCORRECT: High rad signal sent only to FV-4671, GWPS Discharge Flow Valve.
- B: INCORRECT: High rad signal sent only to FV-4671, GWPS Discharge Flow Valve.
- C: INCORRECT: High rad signal sent only to FV-4671, GWPS Discharge Flow Valve.
- D: CORRECT - High rad signal sent only to FV-4671, GWPS Discharge Flow Valve.

**Question Level:** F **Question Difficulty** 3

**Justification:**

Student must know the automatic actions for the various Process Rad Monitors.



**Exam Bank No.:** 1330

**Last used on an NRC exam:** 2005

**RO Sequence Number:** 24

Which one of the following correctly describes the SEQUENCE of events as Instrument Air pressure lowers from the normal operating value?

- A. -Air Compressor 14 (24) starts/loads.  
-Service Air Isolation Valve PV-9785 closes.  
-Instrument Air to Yard Valve PV-8568 closes.  
-Instrument Air Dryer Bypass Valve PV-9983 opens.
- B. -Instrument Air to Yard Valve PV-8568 closes.  
-IA Compressor 14 (24) starts/loads.  
-Instrument Air Dryer Bypass Valve PV-9983 opens.  
-Service Air Isolation Valve PV-9785 closes.
- C. -Air Compressor 14 (24) starts/loads.  
-Instrument Air Dryer Bypass Valve PV-9983 opens.  
-Service Air Isolation Valve PV-9785 closes.  
-Instrument Air to Yard Valve PV-8568 closes.
- D. -Service Air Isolation Valve PV-9785 closes.  
-IA Compressor 14 (24) starts/loads.  
-Instrument Air Dryer Bypass Valve PV-9983 opens.  
-Instrument Air to Yard Valve, PV-8568 closes.

**Answer: A** -Air Compressor 14 (24) starts/loads.  
-Service Air Isolation Valve PV-9785 closes.  
-Instrument Air to Yard Valve PV-8568 closes.  
-Instrument Air Dryer Bypass Valve PV-9983 opens.

**Exam Bank No.:** 1330

**K/A Catalog Number:** 078 A3.01

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 3.1 **10CFR Reference:** 55.41(b)(4)

Ability to monitor automatic operation of the IAS, including: Air pressure

**STP Lesson:** LOT 202.26 **Objective Number:** 92995

Given a scenario in which Instrument Air pressure is decreasing, PREDICT Instrument and Service Air system component automatic actions that will occur as pressure decreases.

**Reference:** OPOP04-IA-0001, Loss Of Instrument Air, Rev. 15

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank

**Modified from**

**Distractor Justification**

- A: CORRECT: This is the correct sequence IAW the system operating and off-normal procedures.
- B: INCORRECT: There are two items out of place.
- C: INCORRECT: The Inst. Air Dryer Bypass is out of place (should be last, not second)
- D: INCORRECT: There are 2 items out of place.

**Question Level:** F **Question Difficulty** 3

**Justification:**

Student must know the automatic actions and setpoints for the IA system.

**Exam Bank No.:** 2116

**Last used on an NRC exam:** Never

**RO Sequence Number:** 25

Given the following:

- Unit 1 is at 100% Reactor power.
- Instrument Air pressure begins to lower.

In accordance with POP04-IA-0001, Loss of Instrument Air, which one of the following is the FIRST Instrument Air pressure reached that would require a manual Reactor Trip?

- A. 69
- B. 64
- C. 59
- D. 54

**Answer:** C 59

**Exam Bank No.:** 2116

**K/A Catalog Number:** APE 065 AA2.06      **Tier:** 1      **Group/Category:** 1

**RO Importance:** 3.6      **10CFR Reference:** 55.41(b)(7)

Ability to determine and interpret the following as they apply to the Loss of Instrument Air: When to trip reactor if instrument air pressure is decreasing.

**STP Lesson:** LOT 505.01      **Objective Number:** 92108

Given a plant condition, STATE the actions required to be performed per the applicable Off-Normal procedure.

**Reference:** OPOP04-IA-0001, Rev.15

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified from**

**Distractor Justification**

- A: INCORRECT: per OPOP04-IA-0001, a manual Reactor trip is required if air pressure goes below 60 psig.
- B: INCORRECT: per OPOP04-IA-0001, a manual Reactor trip is required if air pressure goes below 60 psig.
- C: CORRECT: if air pressure goes below 60 psig, a manual Reactor trip is required by OPOP04-IA-0001.
- D: INCORRECT: per OPOP04-IA-0001, a manual Reactor trip is required if air pressure goes below 60 psig.

**Question Level:** F      **Question Difficulty** 3

**Justification:**

Student must know the procedural requirement to perform a manual Reactor Trip on lowering Inst. Air pressure.

**Exam Bank No.:** 1073

**Last used on an NRC exam:** 2001

**RO Sequence Number:** 26

Given the following:

- Unit 2 Reactor power is at 23% with a plant startup in progress.
- Unit 2 is operating at End of Life (EOL) conditions.
- Main Turbine EHC is in IMP IN mode.
- All systems are in their normal lineup for the current power level.

Subsequently, a Main Steam Safety Valve fails open.

Which one of the following correctly describes the plant response to this failure assuming NO operator action?

	Initial Rx Power Response	Final Reactor Condition
A	rises	Tripped on Power Range Low setpoint
B	lowers	Tripped on Power Range Low setpoint
C	rises	Stabilize at approximately 28% power
D	lowers	Stabilize at approximately 28% power

**Answer:** C rises Stabilize at approximately 28% power

**Exam Bank No.:** 1073

**K/A Catalog Number:** 039 K5.08

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 3.6 **10CFR Reference:** 55.41(b)(5)

Knowledge of the operational implications of the following concepts as they apply to the MRSS: Effect of steam removal on reactivity.

**STP Lesson:** LOT 204.01 **Objective Number:** 20401

Given plant or system conditions, predict the response of the plant and/or systems.

**Reference:** LOT 204.01, LOT 202.01, LOT 202.09

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank

**Modified from**

**Distractor Justification**

- A: INCORRECT: Rx power will rise as stated, however no Rx trip will occur because the Power Range Low Setpoint trip was bypassed when the Rx exceeded 10% power.
- B: INCORRECT: Rx power will rise, not lower as stated. At EOL conditions, there is a negative moderator coefficient which will result in a positive reactivity addition (power rise) when RCS temperature lowers due to the failed SG Safety Valve.
- C: CORRECT: Rx power will rise as stated. At EOL conditions, there is a negative moderator coefficient which will result in a positive reactivity addition (power rise) when RCS temperature lowers due to the failed SG Safety Valve. No Rx trip will occur because the Power Range Low Setpoint trip was bypassed when the Rx exceeded 10% power. Each SG Safety Valve can pass approximately 5% of rated steam flow therefore the Rx will stabilize at approx. 28% power.
- D: INCORRECT: Rx power will rise, not lower as stated. At EOL conditions, there is a negative moderator coefficient which will result in a positive reactivity addition (power rise) when RCS temperature lowers due to the failed SG Safety Valve. The Rx will stabilize at approximately 28% power as stated.

**Question Level:** H **Question Difficulty** 3

**Justification:**

Student must apply principles of reactor and steam plant operation along with knowledge of Main Steam Safety Valve capacity to determine the plant response.

**Exam Bank No.:** 1738

**Last used on an NRC exam:** Never

**RO Sequence Number:** 27

Which one of the following conditions, BY ITSELF, would result in automatic closure of the Main Steam Isolation Valves?

- A. Containment pressure rising to 2.7 psig due to a small RCS leak.
- B. RCS pressure lowering to 1850 psig due to a stuck open Pressurizer Safety Valve.
- C. Cooling down the plant to 500°F with RCS pressure at 1990 psig,
- D. Raising RCS pressure to 1950 psig with RCS temperature at 475°F.

**Answer:** C Cooling down the plant to 500°F with RCS pressure at 1990 psig,

**Exam Bank No.:** 1738

**K/A Catalog Number:** 039 A3.02                      **Tier:** 2    **Group/Category:** 1

**RO Importance:** 3.1            **10CFR Reference:** 55.41(b)(7)

Ability to monitor automatic operation of the MRSS, including: Isolation of the MRSS.

**STP Lesson:** LOT 201.20            **Objective Number:** 507227

Given a description of plant conditions, ANALYZE the conditions and PREDICT how the Solid State Protection System will respond.

**Reference:** LOT201.20, SSPS

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank                      **Modified from**

**Distractor Justification**

- A: INCORRECT - High RCB pressure SI will result in an Auto MSL isolation, however the setpoint is 3.0 psig in containment.
- B: INCORRECT - RCS pressure less than 1857 psig will result in an SI signal, but not an auto MSL isolation.
- C: CORRECT - This condition will result in steamline pressure being less than 735 psig with Low Steamline Pressure SI still enabled (RCS pressure is greater than P-11), which will result in an auto SI and MSL isolation.
- D: INCORRECT - At this temperature, raising pressure above the P-11 setpoint of 1985 psig would result in an auto MSL isolation, but only raising pressure to 1950 psig will not reach the P-11 setpoint thus no MSI will occur.

**Question Level:** H            **Question Difficulty** 3

**Justification:**

The student must evaluate each condition using the given circumstances and use their knowledge of actuation setpoints to determine when an automatic main steamline isolation will occur.



**Exam Bank No.:** 2088

**Last used on an NRC exam:** Never

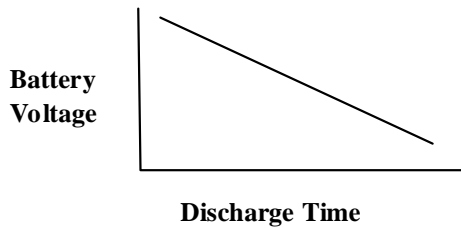
**RO Sequence Number:** 28

Given the following:

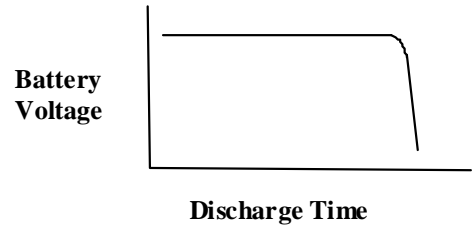
- The in-service Battery Charger for 125 VDC Bus E1A11 has de-energized.
- 125 VDC Bus E1A11 is being supplied ONLY by its 125 VDC Battery.

Assuming the loads on 125 VDC Bus E1A11 remain the same, which one of the below correctly depicts the expected response of Battery E1A11 voltage?

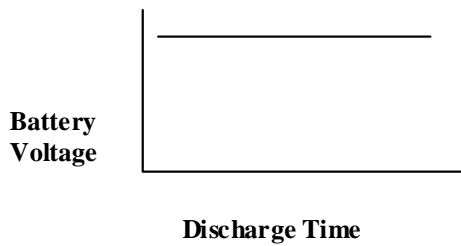
A.



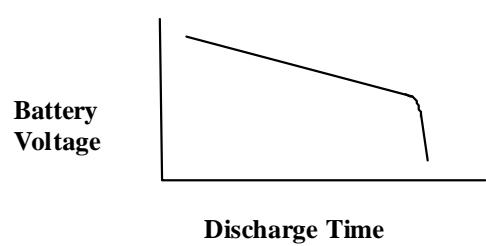
C.



B.



D.



**Answer:** D None. Answer is a figure only.

**Exam Bank No.:** 2088

**K/A Catalog Number:** 063 A1.01

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 2.5 **10CFR Reference:** 55.41(b)(7)

Ability to predict and/or monitor changes in parameters associated with operating the DC electrical system controls including: Battery capacity as it is affected by discharge rate.

**STP Lesson:** LOT 201.37 **Objective Number:** 82197

STATE the effects that varying the Class 1E 125 VDC System battery discharge rates will have on their capacity.

**Reference:** LOT 201.37

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: Battery capacity will continually lower as it's being discharged, as shown. However, it will reach a point where an abrupt change occurs and thereafter the battery capacity rapidly declines.
- B: INCORRECT: Battery capacity represents the stored energy of a battery. As this energy is used, the remaining capacity will continually lower unless the battery is re-charged.
- C: INCORRECT: Battery capacity represents the stored energy of a battery. As this energy is used, the remaining capacity will continually lower unless the battery is re-charged. The characteristic or a rapid decline in battery capacity after an extended discharge is a correct response for a battery.
- D: CORRECT: Battery capacity will continuously lower as it's being discharged for a period of time then a rapid decline will occur which indicates it has reached the end of its useful capacity.

**Question Level:** F **Question Difficulty** 3

**Justification:**

The student must know how the capacity of a battery will vary as the battery discharges.

**Exam Bank No.:** 2087

**Last used on an NRC exam:** Never

**RO Sequence Number:** 29

Given the following:

- Unit 1 is operating at 100% power.
- All systems are in their normal lineup EXCEPT 120 VAC Vital Bus DP 1204 is being supplied by its Voltage Regulating Transformer (VRT) via the MANUAL BYPASS Switch.

A loss of power to DP 1204 will occur if power is lost on:

- A. Unit 1 Standby Transformer.
- B. Unit 2 Standby Transformer.
- C. 13.8 kV Auxiliary Bus '1F'
- D. 13.8 kV Auxiliary Bus '1H'

**Answer:** D 13.8 kV Auxiliary Bus '1H'

**Exam Bank No.:** 2087

**K/A Catalog Number:** 062 A1.03

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 2.5 **10CFR Reference:** 55.41(b)(7)

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ac distribution system controls including: Effect on instrumentation and controls of switching power supplies.

**STP Lesson:** LOT 201.38 **Objective Number:** 97935

Given a change in plant or system condition EXPLAIN the operation of the Class 1E Vital 120 VAC System

**Reference:** LOT 201.38

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: Standby Bus 1H provides power to the 'C' Train of the Vital Electrical Distribution System and ultimately Instrumentation Channel IV which correspond to Vital instrument bus DP 1204. U-1 Stdby Transformer is a possible source of power to Standby Bus 1H, but is not the normal power supply to the bus. Therefore, a loss of U-1 Stdby Transformer will not directly affect power to DP 1204.
- B: INCORRECT: Standby Bus 1H ultimately provides power to DP 1204 (see above). U-2 Stdby Transformer is a possible source of power to Standby Bus 1H, but is not the normal power supply to the bus. Therefore, a loss of U-2 Stdby Transformer will not directly affect power to DP 1204.
- C: INCORRECT: 13.8 kV Auxiliarty Bus 1F normally supplies Channels I and II Vital instrumentation buses (DP 1201 and 1202), not DP 1204. Therefore a loss of Aux Bus 1F will not affect power to DP 1204. Channels 1 and II correspond to Channels 'A' and 'D'. If the student mistakenly associates DP 1204 with Channel 'D', this distracter will be seem like the correct answer.
- D: CORRECT: 13.8 kV Aux Bus 1H normally supplies 13.8 kV Standby Bus 1H. Standby Bus 1H ultimately provides power to Vital instrument bus DP 1204. Normally, the Vital instrument buses are powered via Vital DC buses that will remain energized from backup batteries if normal power is lost. In the given configuration however, DP 1204 will lose power it's being supplied via the Manual Bypass Sw. which bypasses the battery backup. The Manual Bypass Sw. supplies power to DP 1204 from a Vital 480 VAC bus that will lose power when Aux Bus 1H loses power.

**Question Level:** H **Question Difficulty** 3

**Justification:**

Student must know the normal electrical lineup to the Vital 120 VAC buses and determine how the loss of power affects DP 1204 when it's lined up up to the Manual Bypass Sw.

**Exam Bank No.:** 2077

**Last used on an NRC exam:** Never

**RO Sequence Number:** 30

To support plant requirements, an additional Open Loop Aux Cooling Water (OLACW) Pump is started.

The resulting rise in OLACW system flow will cause Closed Loop Aux Cooling Water (CLACW) temperature to ....

- A. rise. An additional CLACW Pump should also be started to accommodate the rise in temperature.
- B. rise. Temperature control valves in the CLACW System will open to accommodate the rise in temperature.
- C. lower. Manual throttle valves in the CLACW System will have to be adjusted to accommodate the drop in temperature.
- D. lower. Temperature control valves in the CLACW System will close to accommodate the drop in temperature.

**Answer:** D lower. Temperature control valves in the CLACW System will close to accommodate the drop in temperatre.

**Exam Bank No.:** 2077

**K/A Catalog Number:** 076 A1.02

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 2.6 **10CFR Reference:** 55.41(b)(4)

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the SWS controls including: Reactor and turbine building closed cooling water temperatures.

**STP Lesson:** LOT 204.01 **Objective Number:** 20401

Given plant or system conditions, predict the response of the plant and/or systems.

**Reference:** LOT 202.23, LOT 202.24

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: OLACW cools CLACW. Therefore a rise in OLACW flow will cool off CLACW. Starting an additional CLACW pump would not be required.
- B: INCORRECT: OLACW cools CLACW. Therefore a rise in OLACW flow will cool off CLACW. Since CLACW temperature is lower, the control valves in the system would throttle close.
- C: INCORRECT: The temperature direction is correct, however the CLACW system employs automatic control valves for temperature control of cooled loads.
- D: CORRECT: OLACW cools CLACW. Therefore a rise in OLACW flow will lower the temperature of CLACW since there is no automatic temperature control. With lowering temperature in the CLACW system, control valves on the cooled components will throttle closed to maintain the desired temperature.

**Question Level:** F **Question Difficulty** 3

**Justification:**

The applicant must know which system is the heat load and which is the heat sink and also the manner of temperature control for the loads cooled by CLACW.

**Exam Bank No.:** 1487

**Last used on an NRC exam:** Never

**RO Sequence Number:** 31

Given the following:

- Unit 1 is at 100% power.
- All automatic control systems are in their normal lineup.
- The controlling Pressurizer level transmitter LT-0465 fails at its CURRENT value.

Assuming NO operator action is taken, which one of the following correctly describes the effect on charging flow and ACTUAL Pressurizer level if plant load is now reduced to 10% power?

Charging flow will...

- A. RISE because actual Pressurizer level is LOWERING.
- B. RISE causing actual Pressurizer level to RISE.
- C. REMAIN CONSTANT, but actual Pressurizer level will LOWER.
- D. LOWER causing actual Pressurizer level to LOWER.

**Answer:** D LOWER causing actual Pressurizer level to LOWER.

**Exam Bank No.:** 1487

**K/A Catalog Number:** 011 K1.01

**Tier:** 2 **Group/Category:** 2

**RO Importance:** 3.6 **10CFR Reference:** 55.41(b)(7)

Knowledge of the physical connections and/or cause-effect relationships between the PZR LCS and the following systems: CVCS.

**STP Lesson:** LOT 201.14 **Objective Number:** 92779

GIVEN plant conditions, DETERMINE their effects on the Pressurizer pressure and level control system.

**Reference:** LOT 201.14

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank

**Modified from**

**Distractor Justification**

- A: INCORRECT: Actual Pzr level WILL lower, but it's due to charging flow lowering, not because actual level lowers causing charging flow to rise as the case is normally.
- B: INCORRECT: Charging flow will NOT rise, but lower due to the change in program level as power is lowered.
- C: INCORRECT: Charging flow will lower due to the change in Program level as power is lowered, not remain constant as stated.
- D: CORRECT: As power is lowered, the program level signal is lowered. If the selected level detector fails 'as is', a level error will develop that represents actual level being higher than program level. The LCS response is to lower charging flow to bring actual level back to program. However, no matter how low charging flow goes, pzr level sensed by the failed channel does not change although actual pzr level is lowering.

**Question Level:** H **Question Difficulty** 3

**Justification:**

Student must determine how the Pzr. Level Control System will respond with the stated failure as power is lowered.



**Exam Bank No.:** 494

**Last used on an NRC exam:** 1995

**RO Sequence Number:** 32

Given the following:

- Unit 2 is operating at 100% power.
- All systems are in their normal lineup for the power level.
- The controlling Pressurizer pressure channel transmitter fails HIGH.

Which one of the following correctly describes the final plant conditions, assuming NO operator action?

The Reactor is ...

- A. still at power and RCS pressure is still approximately 2235 psig.
- B. still at power and RCS pressure is approximately 2185 psig.
- C. tripped and RCS pressure is approximately 2185 psig.
- D. tripped and RCS pressure is approximately 1600 psig.

**Answer:** D tripped and RCS pressure is approximately 1600 psig

**Exam Bank No.:** 494

**K/A Catalog Number:** 010 K3.01                      **Tier:** 2    **Group/Category:** 1

**RO Importance:** 3.8            **10CFR Reference:** 55.41(b)(5)

Knowledge of the effect that a loss or malfunction of the PZR PCS will have on the following: RCS

**STP Lesson:** LOT 201.14            **Objective Number:** 9008

State the effect of a loss of pressurizer pressure control on ESFAS, RCS and RPS.

**Reference:** OPOP04-RP-0001, Rev 15; LOT 201.14

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank                      **Modified from**

**Distractor Justification**

- A: INCORRECT: this would be the case if the instrument failure was mitigated through the Pressurizer Pressure Control System. However, even though there are some mitigation features in the Pressurizer Pressure Control System, they will not be sufficient to allow recovery of RCS pressure.
- B: INCORRECT: this would be the response if only a Pressurizer PORV had opened due to the instrument failure. However, the Pressurizer Spray Valves have also opened resulting in an RCS depressurization and Rx trip.
- C: INCORRECT: it's true that the Rx has tripped, however the RCS pressure is incorrect. Because the Pzr Spray Valves have opened and not reclosed, RCS pressure will continue to lower until safety injection occurs. Subsequently, RCS pressure will stabilize at approximately 1600 psig due to saturation in the RCS hot legs and the shutoff head of the HHSI pumps.
- D: CORRECT - Spray valves and one PORV will open. Heaters will energize. PORV will close as interlock pressure channel drops below 2185 psig. Spray valves will remain open and overcome heaters, resulting in reactor trip and safety injection. RCS will ultimately stabilize at HHSI pump shutoff head in a saturated condition..

**Question Level:** H            **Question Difficulty** 3

**Justification:**

Students must be able to evaluate how the given instrument failure affects RCS pressure by using their knowledge of Pressurizer Pressure Control to determine the response of the plant and RCS pressure.

**Exam Bank No.:** 2094

**Last used on an NRC exam:** Never

**RO Sequence Number:** 33

Given the following:

- Unit 1 has tripped from full power due to a Loss of Offsite Power (LOOP).
- The crew is performing the actions of 0POP05-EO-ES03, Natural Circulation Cooldown with Steam Void in Vessel.
- All Pressurizer Pressure controls are in AUTOMATIC EXCEPT Pressurizer Pressure Controller, PK-0655A, is in MANUAL.
- RCS Tave = 510 °F.
- RCS Pressure = 1650 psig.
- Pressurizer level = 30%.
- Reactor Vessel Water Level (RVWL) Upper Head Level = 64%.

Subsequently:

- The operator lowers the demand output of PK-0655A to 0%.

Assuming no other operator actions are taken, RCS pressure will...

- A. LOWER and Pressurizer Level will LOWER.
- B. LOWER and Pressurizer Level will RISE.
- C. RISE and Pressurizer Level will LOWER.
- D. RISE and Pressurizer Level will RISE.

**Answer:** C RISE and Pressurizer Level will LOWER.

**Exam Bank No.:** 2094

**K/A Catalog Number:** EPE WE10 EK2.1      **Tier:** 2      **Group/Category:** 1

**RO Importance:** 3.3      **10CFR Reference:** 55.41(b)(7)

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

**STP Lesson:** LOT 201.14      **Objective Number:** 92779

GIVEN plant conditions, DETERMINE their effects on the Pressurizer pressure and level control system.

**Reference:** LOT 201.14

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: RCS pressure will rise, not lower, because the 0% demand from the Pressurizer Pressure controller will energize the heaters. Pressurizer level will lower, as stated, due to pressure rising.
- B: INCORRECT: RCS pressure will rise, not lower, because the 0% demand from the Pressurizer Pressure controller will energize the heaters. Pressurizer level will lower, not rise, because the rise in RCS pressure will reduce the head void causing water to replace some of the void volume.
- C: CORRECT: Lowering the demand on the Pressurizer Pressure controller to 0% will cause the Pressurizer heaters to energize thereby raising RCS pressure. As pressure goes up, the void in the RV Head gets compressed. This will result in Pressurizer level lowering as inventory fills the RV Head area where the volume of the void is being reduced.
- D: INCORRECT: RCS pressure will rise, as stated, but Pressurizer level will lower as the void in the head shrinks.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

Student must be able to determine how the 0% demand of the Pressurizer Pressure controller affects RCS pressure and subsequently Pressurizer level.

**Exam Bank No.:** 2100

**Last used on an NRC exam:** Never

**RO Sequence Number:** 34

Given the following:

- Unit 1 is performing a cooldown.
- RCS Pressure = 1785 psig
- RCS Temperature = 532 °F
- RCP's 'A' and 'D' are in service.

Which one of the below correctly describes the plant response if the controlling Pressurizer Pressure channel fails HIGH assuming there is NO operator action?

RCS pressure will lower to saturation conditions because...

- A. the normal spray valves AND Pressurizer PORV 655A will open. Saturation temperature in the Pressurizer will RISE during this event.
- B. the normal spray valves AND Pressurizer PORV 655A will open. Saturation temperature in the Pressurizer will LOWER during this event.
- C. ONLY the normal spray valves will open. Saturation temperature in the Pressurizer will RISE during this event.
- D. ONLY the normal spray valves will open. Saturation temperature in the Pressurizer will LOWER during this event.

**Answer:** D ONLY the normal spray valves will open. Saturation temperature in the Pressurizer will LOWER during this event.

**Exam Bank No.:** 2100

**K/A Catalog Number:** APE 027 AK1.01      **Tier:** 1      **Group/Category:** 1

**RO Importance:** 3.5      **10CFR Reference:** 55.41(b)(7)

Knowledge of the operational implications of the following concepts as they apply to Pressurizer Pressure Control Malfunctions: Definition of saturation temperature.

**STP Lesson:** LOT 201.14      **Objective Number:** 92779

GIVEN plant conditions, DETERMINE their effects on the Pressurizer pressure and level control system.

**Reference:** LOT 201.14

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: The Pzr. PORV will NOT open because there's a block being provided by a separate Pzr. Pressure channel once RCS pressure goes below 2185 psig. Since pressurizer pressure is lowering, saturation temperature will also lower and not rise.
- B: INCORRECT: The Pzr. PORV will NOT open because there's a block being provided by a separate Pzr. Pressure channel once RCS pressure goes below 2185 psig. The saturation temperature direction is correct.
- C: INCORRECT: It is true that only the spray valves will open, however saturation temperature in the pressurizer will lower and not rise.
- D: CORRECT: Only the spray valve will open due to the PORV blocking signal at 2185 psig. Saturation temperature will lower as pressurizer pressure lowers.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

Candidate must understand how the failed pressure channel will affect the plant under the given conditions (which are different than normal operations). The candidate must also know the definition of saturation temperature and how it is affected by lowering pressure.

**Exam Bank No.:** 2099

**Last used on an NRC exam:** Never

**RO Sequence Number:** 35

Given the following:

- Unit 1 is operating at full power.
- Channel 4 OTDT is in a TRIPPED condition due to I&C testing.
- You are the Primary Reactor Operator.

Subsequently,

- The controlling Pressurizer Pressure Channel (3) fails low.
- Reactor power remains stable at full power.

Which one of the below correctly describes the plant status and your required actions?

	Plant Status	Required Operator Action
A	Reactor has not tripped, but should have.	Perform immediate actions of OPOP05-EO-EO00, Reactor Trip or Safety Injection beginning with attempting a manual Reactor Trip.
B	Reactor has not tripped, but should have.	Perform immediate actions of OPOP05-EO-FRS1, Response to Nuclear Power Generation – ATWS beginning with opening LC Breakers 1L1 and 1K1.
C	Reactor has not tripped. No Reactor trip condition is present.	Perform the immediate actions of OPOP04-RP-0001, Loss of Automatic Pressurizer Pressure Control, and DE-SELECT the failed channel.
D	Reactor has not tripped. No Reactor trip condition is present.	Perform the immediate actions of OPOP04-RP-0001, Loss of Automatic Pressurizer Pressure Control, and take MANUAL CONTROL of the Pressurizer Pressure Controller.

**Answer:** A Reactor has not tripped, but should have.; Perform immediate actions of OPOP05-EO-EO00, Reactor Trip or Safety Injection beginning with attempting a manual Reactor Trip.

**Exam Bank No.:** 2099

**K/A Catalog Number:** EPE 029 G2.4.47      **Tier:** 1      **Group/Category:** 1

**RO Importance:** 4.2      **10CFR Reference:** 55.41(b)(6)

Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.

**STP Lesson:** LOT 504.05      **Objective Number:** 80084

From memory STATE/IDENTIFY the immediate actions of POP05-EO-EO00 in their required sequence.

**Reference:** LOT 504.05

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: CORRECT: When the controlling Pressurizer Pressure channel fails low, it will create an OTDT trip signal for that channel. This will result in a Reactor trip signal being generated on OTDT because a different channel of OTDT was already tripped. If a Rx trip hasn't occurred, an ATWS condition exists and the operator must take immediate action to shutdown the Reactor. The proper EOP to enter is 0POP05-EO-EO00, Reactor Trip or Safety Injection, and the first immediate action to be performed is to attempt a manual reactor trip.
- B: INCORRECT: It's true the reactor has not tripped but should have, but the procedure to enter and the action to take is incorrect.
- C: INCORRECT: It's true the reactor has not tripped, but it's not true that a reactor trip condition is not present. The action stated is also not correct for the plant condition, but it is a correct action if the failed pressure channel were a high failure.
- D: INCORRECT: It's true the reactor has not tripped, but it's not true that a reactor trip condition is not present. The action stated is also not correct for the plant condition, but it is a correct action for a low failure of a Pressurizer pressure channel as stated in the question.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

Student must determine plant status from the given information and know what immediate action is required.



**Exam Bank No.:** 2109**Last used on an NRC exam:** Never**RO Sequence Number:** 36

Which one of the following correctly describes the characteristics of the Containment Carbon Units?

The Containment Carbon Filter Units are designed to remove \_\_\_\_\_ radioactivity from the Containment atmosphere, if necessary, prior to routine Containment entries while at power. They are powered from the \_\_\_\_\_ electrical distribution system.

	Carbon Filter Units are designed to be used prior to Containment entry during:	Carbon Filter Fans are powered from the following Electrical Distribution:
A	Iodine	Non- Class 1E busses
B	Krypton	Non- Class 1E busses
C	Iodine	Class 1E busses
D	Krypton	Class 1E busses

**Answer:** A Iodine, Non- Class 1E busses

**Exam Bank No.:** 2109

**K/A Catalog Number:** 027 K2.01

**Tier:** 2 **Group/Category:** 2

**RO Importance:** 3.1 **10CFR Reference:** 55.41(b)(9)

Knowledge of bus power supplies to the following: Fans

**STP Lesson:** LOT 202.33 **Objective Number:** 92035

DESCRIBE the flowpath and STATE the functions for each of the following RCB-HVAC subsystems:

- A. Reactor Containment Fan Coolers
- B. Containment Carbon Units
- C. Control Rod Drive Mechanism Ventilation
- D. Containment Cubicles Exhaust
- E. Normal Containment Purge
- F. Supplementary Containment Purge
- G. Tendon Gallery Tunnel Ventilation
- H. Reactor Cavity and Supports Ventilation
- I. Elevator and Machinery Room Ventilation
- J. RCB Chill Water
- K. MSIV Cubicle Ventilation

**Reference:** LOT 202.33

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: CORRECT: The Carbon Units are designed to reduce Containment atmosphere Iodine activity prior to Containment entry. They are not required for Safe Shutdown and are powered from Non-Class 1E power.
- B: INCORRECT: The Carbon Units are designed to reduce Iodine activity prior to Containment entry, not Krypton. They are powered from the non-Class 1E electrical distribution system, as stated.
- C: INCORRECT: The Carbon Units are designed to reduce Iodine activity prior to Containment entry, as stated, but they are powered from the non-Class 1E electrical distribution.
- D: INCORRECT: The Carbon Units are designed to reduce Iodine activity prior to Containment entry, not Krypton.. Additionally, they are powered from non-Class 1E electrical distribution since they are not required for safe shutdown.

**Question Level:** F **Question Difficulty** 3

**Justification:**

Student must know the purpose and power sources to the Containment Carbon Units.

**Exam Bank No.:** 1479

**Last used on an NRC exam:** Never

**RO Sequence Number:** 37

Given the following:

- Unit 1 is in Mode 5
- Pressurizer level is unexpectedly lowering

Which one of the following correctly describes the makeup capability of the Safety Injection (SI) pumps under these plant conditions?

- A. Automatic SI actuation is available to start BOTH High Head and Low Head Safety Injection Pumps.
- B. Safety Injection pumps must be started manually. BOTH High Head and Low Head Safety Injection Pumps are available to be started.
- C. Automatic SI actuation is available to start ONLY Low Head Safety Injection Pumps.
- D. Safety Injection pumps must be started manually. ONLY Low Head Safety Injection Pumps are available to be started.

**Answer:** D Safety Injection pumps must be started manually. ONLY Low Head Safety Injection Pumps are available to be started.

**Exam Bank No.:** 1479

**K/A Catalog Number:** G2.4.9

**Tier:** 3 **Group/Category:**

**RO Importance:** 3.8 **10CFR Reference:** 55.41(b)(10)

Knowledge of low power / shutdown implications in accident (e.g. LOCA or loss of RHR) mitigation strategies.

**STP Lesson:** LOT 201.10 **Objective Number:** 29419

Given a plant condition, predict the operation of the ECCS to include automatic actuations, interlocks and/or trips.

**Reference:** LOT201.10 student handout; OPOP03-ZG-0007, Plant Cooldown

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT - Auto SI cannot occur. HHSI pumps are not available due to Tech Spec restrictions on their use at low temperatures.
- B: INCORRECT - HHSI pumps are not available due to Tech Spec restrictions on their use at low temperatures.
- C: INCORRECT - Auto SI cannot occur.
- D: CORRECT - With the given plant conditions, an automatic SI is not possible due to the lack of energy in the RCS. In Mode 5, all HHSI pumps are required to be disabled due to Tech Spec restrictions on their use at low temperatures.

**Question Level:** H **Question Difficulty** 3

**Justification:**

From the given conditions, the applicant must determine that an auto SI from high RCB pressure cannot occur with the RCS less than 200 degrees. The applicant must also have knowledge of the procedural requirements for HHSI pumps in Mode 5.

**Exam Bank No.:** 1113**Last used on an NRC exam:** 2003**RO Sequence Number:** 38

Given the following:

- Unit 1 is in Mode 5 with RHR Trains 'A' and 'B' in service maintaining RCS temperature at 170°F.
- Both RHR trains are equally sharing the RCS heat removal, although only 1 train would be sufficient for the current decay heat generation.
- The RHR HX BYP FLOW CONT valves in RHR Trains 'A' and 'B' are in AUTO.

If Train 'A' RHR HX OUTL TEMP CONT valve, HCV-0864, FULLY CLOSES due to a malfunction, what would be the resulting effects on RHR train flow and temperature assuming NO operator action is taken?

	'A' RHR System (Total) Flowrate	'B' RHR Hx Inlet Temperature
A.	Goes down	Rises above the original temperature
B.	Goes down	Remains at the original temperature
C.	Remains the Same	Rises above the original temperature
D.	Remains the Same	Remains at the original temperature

**Answer:** C Remains the Same; Rises above the original temperature

**Exam Bank No.:** 1113

**K/A Catalog Number:** 005 K6.03

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 2.5 **10CFR Reference:** 55.41(b)(14)

Knowledge of the effect of a loss or malfunction on the following will have on the RHRS: RHR heat exchanger.

**STP Lesson:** LOT 201.09 **Objective Number:** 4245

GIVEN a plant or system condition, PREDICT the operation of the Residual Heat Removal system.

**Reference:** LOT 201.09

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank

**Modified from**

**Distractor Justification**

- A: INCORRECT: the flow thru the 'A' RHR train lowers, but total train flow remains the same because the Hx bypass valve has an automatic feature to maintain total flow in the train constant. The RCS temperature response is correct since less heat will be removed by RHR train 'A' and this will cause a rise in RCS temperature.
- B: INCORRECT: the flow response is incorrect as explained above. Additionally, the inlet temperature of 'B' RHR train will rise since there is less overall cooling of the RCS and the RCS hot legs are where the RHR trains take a suction.
- C: CORRECT: When the Train 'A' Hx outlet valves closes, total system flow will begin lowering. The Hx bypass valve will automatically open to maintain a given total flow therefore Train 'A' total flow remains the same. With less flow going thru the 'A' Hx and more bypassing the 'A' Hx, heat removal by Train 'A' will be less causing RCS temperature to rise. The inlet for the RHR trains comes from the RCS hot legs, therefore as RCS temperature goes up, the 'B' RHR train inlet temperature will also go up. The RHR Hx Outlet Valves (temperature control valves) have no automatic function therefore the 'B' RHR Hx temperature control valve will not change position and RCS temperature will remain higher than it originally was.
- D: INCORRECT: Total Train 'A' flow will remain the same as stated. However, RHR train 'B' inlet temperature will rise as described in answer 'C' above.

**Question Level:** H **Question Difficulty** 3

**Justification:**

Student must determine how the RHR system responds to the given failure and how that response affects RCS heat removal and the condition of the other operating RHR train.

**Exam Bank No.:** 2079

**Last used on an NRC exam:** Never

**RO Sequence Number:** 39

Given the following:

- Unit 2 is in Mode 5
- RHR Trains 'A' and 'B' are in service
- Unit 2 Auxiliary Transformer de-energizes due to a fault condition.

Which one of the following correctly describes how a loss of Unit 2's Auxiliary Transformer affects the Unit 2 RHR system?

- A. RHR Train 'A' and 'B' pumps have stopped.
- B. Only RHR Train 'A' pump has stopped.
- C. Only RHR Train 'B' pump has stopped.
- D. Neither RHR Train 'A' nor 'B' pump has stopped.

**Answer:** B Only RHR Train 'A' pump has stopped.

**Exam Bank No.:** 2079

**K/A Catalog Number:** 005 K2.01

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 3.0 **10CFR Reference:** 55.41(b)(4)

Knowledge of bus power supplies to the following: RHR pumps

**STP Lesson:** LOT 201.09 **Objective Number:** 4245

Given a plant or system condition, predict the operation to the Residual Heat Removal system.

**Reference:** OPOP02-AE-0002, Rev. 31

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: Only RHR Train 'A' has lost power due to the loss of the U2 Aux Transformer therefore only the Train 'A' RHR pump stops. Refer to the 'CORRECT' answer description for further detail.
- B: CORRECT: RHR Train 'A' RHR pump receives its power from the Train 'A' 1E distribution system. Train 'A' 1E electrical receives power from 13.8 kV Bus F which is normally cross-tied to Aux Bus F. Aux Bus F receives its power from the Aux Transformer, therefore a loss of the Aux Transformer will also result in a loss of Train 'A' 1E power causing the Train 'A' RHR pump to stop. Train 'B' RHR pump ultimately gets its power from U2 Standby transformer and is therefore unaffected by the loss of the Aux Transformer.
- C: INCORRECT: Train 'B' RHR has not lost power, but Train 'A' RHR has lost power. Refer to the 'CORRECT' answer description for further detail.
- D: INCORRECT: Train 'A' RHR has lost power therefore Train 'A' RHR pump has stopped. Refer to the 'CORRECT' answer description for further detail.

**Question Level:** H

**Question Difficulty** 3

**Justification:**

Student must be able to evaluate the loss of U2 Aux Transformer with regard to the sources of power to the RHR pumps to determine how the loss affects the operating RHR pumps.



**Exam Bank No.:** 2098

**Last used on an NRC exam:** Never

**RO Sequence Number:** 40

Given the following:

- Unit 1 is in Mode 5.
- Residual Heat Removal (RHR) Train 'A' is in service to provide core cooling.
- RHR Train 'B' is in Standby.
- Component cooling water (CCW) Train 'A' is in service.

Subsequently,

- CCW Pump 'A' trips.

Which one of the following correctly describes the RHR system response?

RHR cooling ...

- A. IS lost because Train 'A' RHR pump tripped due to low Train 'A' CCW flow.
- B. IS NOT lost because the CCW Train selected to 'STANDBY' has automatically started and is providing cooling water to the operating RHR Train.
- C. IS lost because there is no cooling water flow through the in-service RHR heat exchanger.
- D. IS NOT lost because the standby RHR and CCW Trains will automatically start to provide core cooling.

**Answer:** C IS lost because there is no cooling water flow through the in-service RHR heat exchanger.

**Exam Bank No.:** 2098

**K/A Catalog Number:** APE 025 AK2.01      **Tier:** 1      **Group/Category:** 1

**RO Importance:** 2.9      **10CFR Reference:** 55.41(b)(7)

Knowledge of the operational implications of the following concepts as they apply to Loss of Residual Heat Removal System: RHR heat exchangers.

**STP Lesson:** LOT 201.09      **Objective Number:** 4245

GIVEN a plant or system condition, PREDICT the operation of the Residual Heat Removal system.

**Reference:** LOT 201.09, LOT201.12

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified from**

**Distractor Justification**

- A: INCORRECT: It's true that RHR cooling has been lost, but the reason is incorrect. There is no RHR pump trip from low CCW flow. There is an RHR pump trip from low RHR flow.
- B: INCORRECT: RHR cooling IS lost. The standby CCW train will start as stated, but it cannot supply the Train 'A' RHR system.
- C: CORRECT: The CCW Trains are specific to the corresponding Train RHR Hx therefore if Train 'A' CCW is lost due to a pump trip, cooling flow is lost the Train 'A' RHR and cannot be restored unless Train 'A' CCW pump is restarted.
- D: INCORRECT: RHR cooling IS lost. Also, there is an automatic start of the standby CCW train, but not the standby RHR train.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

Student must be able to determine how RHR cooling is affected by the trip of the in-service CCW Pump based on the given conditions.

**Exam Bank No.:** 2090**Last used on an NRC exam:** Never**RO Sequence Number:** 41

Given the following:

- A breaker fault in the 'A' Train 4160v Switchgear Room has resulted in a switchgear fire.
- The switchgear has been DE-ENERGIZED.

Which one of the following correctly describes the appropriate fire classification AND the equipment used to fight this fire?

	Fire Classification	Fire Fighting method
A	Class B	Fire Brigade will use water fog or Carbon Dioxide.
B	Class B	Halon is automatically discharged into the room.
C	Class C	Fire Brigade will use water fog or Carbon Dioxide.
D	Class C	Halon is automatically discharged into the room.

**Answer:** C Class C; Fire Brigade will use water fog or Carbon Dioxide.

**Exam Bank No.:** 2090

**K/A Catalog Number:** APE 067 AA1.08      **Tier:** 1      **Group/Category:** 2

**RO Importance:** 3.4      **10CFR Reference:** 55.41(b)(4)

Ability to operate and/or monitor the following as they apply to the Plant Fire on Site: Fire fighting equipment used on each class of fire.

**STP Lesson:** FBT 001.42      **Objective Number:** 14206

Given a Class 'C' fire situation, select the correct method of fire suppression.

**Reference:** FBT 001.42

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: A Class 'B' fire involves flammable liquids such as oil, paint, etc. therefore the switchgear fire is not Class 'B'. As stated, water fog or CO2 are the appropriate fire fighting methods for the switchgear fire.
- B: INCORRECT: A Class 'B' fire involves flammable liquids such as oil, paint, etc. therefore the switchgear fire is not Class 'B'. Halon could be used to fight Class 'C' fires, but the switchgear rooms are not equipped with Halon protection.
- C: CORRECT: A Class 'C' fire is one involving electrical/electronic material. There is no automatic fire suppression system in the vital switchgear rooms, only manual actuation. The appropriate equipment for a Class 'C' fire is Carbon Dioxide or a water fog (if the switchgear is de-energized).
- D: INCORRECT: The switchgear fire is Class 'C' as stated. Halon could be used to fight Class 'C' fires, but the switchgear rooms are not equipped with Halon protection.

**Question Level:** F      **Question Difficulty** 2

**Justification:**

Student must know fire classifications and what equipment is used for each class of fire.

**Exam Bank No.:** 1314

**Last used on an NRC exam:** 2005

**RO Sequence Number:** 42

Given the following:

- Unit 1 is in Mode 4
- RCS pressure is at 1400 psig.

If a Pressurizer PORV inadvertently opened, what would the operator expect the temperature of the fluid entering the PRT to be assuming the PRT pressure is initially 5 psig AND which of the listed cooling methods is available to cool the PRT?

	Expected fluid temperature entering the PRT	Available PRT cooling method
A	220-230 °F	Feed and bleed the PRT using Reactor Makeup Water and the PRT Drain Pumps.
B	220-230 °F	Recirculate PRT contents using the RCDDT Pumps through a heat exchanger supplied by Component Cooling Water
C	260-270 °F	Feed and bleed the PRT using Reactor Makeup Water and the PRT Drain Pumps.
D	260-270 °F	Recirculate PRT contents using the RCDDT Pumps through a heat exchanger supplied by Component Cooling Water

**Answer:** D 260-270 °F; Recirculate PRT contents using the RCDDT Pumps through a heat exchanger supplied by Component Cooling Water

**Exam Bank No.:** 1314

**K/A Catalog Number:** 007 K4.01

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 2.6 **10CFR Reference:** 55.41(b)(14)

Knowledge of PRTS design features(s) and/or interlock(s) which provide for the following: Quench Tank Cooling

**STP Lesson:** LOT 102.54 **Objective Number:** N99790

Apply saturated and superheated Steam Tables in solving liquid-vapor problems.

**Reference:** LOT20104, LOT 102.54

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: The temperature range provided would be true if the fluid entering the PRT were saturated, however it's not saturated, but superheated. The cooling method listed is NOT one of the available methods of cooling the PRT because there are no 'PRT Drain Pumps'.
- B: INCORRECT: The temperature range provided would be true if the fluid entering the PRT were saturated, however it's not saturated, but superheated. The cooling method listed is one of the cooling methods available to cool the PRT.
- C: INCORRECT: The temperature range of the fluid entering the PRT is correct (fluid will be superheated steam). With a PRT pressure of 5 psig (20 psia), the fluid temperature would be 260-270 deg. F per the Steam Tables. The cooling method listed is NOT one of the available methods of cooling the PRT because there are no 'PRT Drain Pumps'.
- D: CORRECT: The temperature range of the fluid entering the PRT is correct (fluid will be superheated steam). With a PRT pressure of 5 psig (20 psia), the fluid temperature would be 260-270 deg. F per the Steam Tables. The cooling method listed is one of the cooling methods available to cool the PRT.

**Question Level:** H **Question Difficulty** 3

**Justification:**

Student must be able to evaluate given plant conditions and use the Steam Tables to determine fluid temperature entering the PRT. Additionally, he/she must know what methods of cooling the PRT exist.

**Exam Bank No.:** 2073

**Last used on an NRC exam:** Never

**RO Sequence Number:** 43

Given the following:

- Unit 1 is at 50% power.
- A plant startup is in progress in accordance with OPOP03-ZG-0003, Plant Startup to 100%.

As Reactor power is raised and RCS Cold Leg temperatures lower, indicated Reactor power on the Nuclear Instrumentation (NI) channels will be \_\_\_\_\_ actual Reactor power. This means the Reactor Protection trips that use an NI power signal will occur at a \_\_\_\_\_ Reactor power than they should.

- A. above, lower
- B. above, higher
- C. below, higher
- D. below, lower

**Answer:** C below, higher

**Exam Bank No.:** 2073

**K/A Catalog Number:** 015 A1.03

**Tier:** 2 **Group/Category:** 2

**RO Importance:** 3.7 **10CFR Reference:** 55.41(b)(6)

Ability to predict and/or monitor changes in parameters to prevent exceeding design limits associated with operating NIS controls including: NIS power indication.

**STP Lesson:** LOT 201.16 **Objective Number:** 96407

Analyze changes to plant conditions, instrument calibrations, and plant systems to determine effects on Excore Nuclear Instrumentation.

**Reference:** LOT 201.16

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: The NI channels will read below actual power, not above. Additionally, the error introduced will cause a specified Rx trip to occur at a higher actual power than designed.
- B: INCORRECT: The NI channels will read below actual power, not above. The error introduced will cause a specified Rx trip to occur at a higher actual power than designed, as stated in this distracter.
- C: CORRECT: As power is raised, the RCS T cold temperatures lower causing more of a shielding effect for the NI detectors. This will result in the NI detectors reading a lower power than actual. Since the power sensed by the NI detectors is lower than actual, a Reactor trip at a specified setpoint will occur at a higher actual power.
- D: INCORRECT: The NI channels will read lower than actual power, as stated in this distracter. However, the error introduced will cause a specified Rx trip to occur at a higher actual power than designed, not lower, as stated in this distracter.

**Question Level:** H **Question Difficulty** 3

**Justification:**

Student must be able to determine effect power reduction has on NI indication and evaluate the change as conservative or non-conservative relative to Reactor protection.



**Exam Bank No.:** 64

**Last used on an NRC exam:** 1999

**RO Sequence Number:** 44

Given the following:

- Unit 2 is at Midloop preparing to install SG nozzle dams.
- All core exit thermocouples (CET's) are operable

Which one of the following correctly describes the effects if a CET detector failed OPEN?

On the Qualified Parameter Display System (QDPS), the affected CET indication would indicate:

- A. ↓LO. The Control Room operators need to verify the Tech Spec requirements for minimum CET detectors are still met.
- B. ↓LO. This will cause the RC TEMP LO ARM COMS alarm to annunciate.
- C. ↑HI. The Control Room operators need to verify the Tech Spec requirements for minimum CET detectors are still met.
- D. ↑HI. This will cause the RC MID LOOP CORE EXIT TEMP HI alarm to annunciate.

**Answer:** A ↓LO. The Control Room operators need to verify the Tech Spec requirements for minimum CET detectors are still met.

**Exam Bank No.:** 64

**K/A Catalog Number:** 017 K6.01

**Tier:** 2 **Group/Category:** 2

**RO Importance:** 2.7 **10CFR Reference:** 55.41(b)(2)

Knowledge of the effect of a loss or malfunction of the following ITM system components: Sensors and detectors.

**STP Lesson:** LOT 201.17 **Objective Number:** 91337

DESCRIBE the operation of the Incore Thermocouples.

**Reference:** LOT105.03, LOT 201.17, Tech Spec Section 3.3

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank

**Modified from**

**Distractor Justification**

- A: CORRECT - An open circuit will cause the thermocouple indicated temperature to fail to LO. Since this makes the CET inoperable, the operator needs to verify the minimum TS requirements are met.
- B: INCORRECT - An open circuit will cause the thermocouple indicated temperature to fail to LO as stated, but will not generate the stated alarm because the incore CET's do not provide an input to the COMS circuit.
- C: INCORRECT - An open circuit will cause the thermocouple indicated temperature to fail to LO, not HI as indicated in this distracter. The action specified is correct.
- D: INCORRECT - An open circuit will cause the thermocouple indicated temperature to fail to LO, not HI as indicated in this distracter. The specified annunciator will alarm if any CET exceeds 160 degrees R.

**Question Level:** H **Question Difficulty** 3

**Justification:**

The student must be able to evaluate the result of an open circuit type of CET failure. Additionally, he/she must know the resulting effects of the failure.

**Exam Bank No.:** 826

**Last used on an NRC exam:** Never

**RO Sequence Number:** 45

Given the following:

- Refueling is in progress on Unit 1.
- A spent fuel assembly is being moved from the reactor to the Upender.
- The fuel assembly is dropped to the bottom of the Transfer Canal.

Which one of the following correctly describes the most immediate radiation hazard and the related source products released from the ruptured spent fuel assembly?

- A. Alpha radiation from activated hydrogen gas.
- B. Gamma radiation from Xenon and Krypton gases.
- C. Alpha radiation from Reactor Coolant fission products.
- D. Gamma radiation from particulate fission products and corrosion products.

**Answer:** B Gamma radiation from Xenon and Krypton gases.

**Exam Bank No.:** 826

**K/A Catalog Number:** G2.3.14                      **Tier:** 3    **Group/Category:**

**RO Importance:** 3.4    **10CFR Reference:** 55.41(b)(12)

Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.

**STP Lesson:** LOT 204.01    **Objective Number:** 20401

Given plant or system conditions, predict the response of the plant and/or systems

**Reference:** UFSAR 15.7.4.2.2

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank                      **Modified from**

**Distractor Justification**

- A: INCORRECT: Hydrogen gas within a fuel rod acts to counter balance external pressure on the rod when the fuel is in the reactor at operating pressure. 'Activated Hydrogen' is Tritium which decays by beta emission. Beta radiation is a relatively strong ionizer and therefore only travels a short distance. It can be easily shielded and so will not present a significant radiation hazard unless it's ingested.
- B: CORRECT: Spent fuel assemblies have some amount of fission gases within the fuel rods depending on the degree of use of the fuel assembly. Fission yields for Xenon and Krypton are higher than most other elements therefore these gases will be present in larger amounts than other gases. Both of these gases decay by gamma emission thereby creating the radiation hazard if released from the clad. Because they are gases, they will rise to the surface of the Spent Fuel Pool where they will enter the surrounding atmosphere and create a radiation hazard due to their decay.
- C: INCORRECT: Fission products predominantly undergo beta, gamma decay. Only the heavier isotopes in the fuel undergo Alpha decay and these are typically not fission products but fuel isotopes or other heavy isotopes created as a result of neutron activation.
- D: INCORRECT: Gamma radiation from particulate fission products and corrosion products can be a significant radiation source, however since the damage to the spent fuel assembly occurred at the bottom of the Transfer Canal, these products will remain in the water and not be released to the surrounding environment as gases will be.

**Question Level:** F                      **Question Difficulty** 3

**Justification:**

Applicant must have knowledge of the potential radiation hazards associated with spent fuel assemblies.

**Exam Bank No.:** 2075

**Last used on an NRC exam:** Never

**RO Sequence Number:** 46

Given the following:

- Waste Monitor Tank (WMT) 1A is being re-circulated for sampling prior to release.
- A SMALL leak develops on the seals of WMT Pump 1A (approximately 50 drops a minute).

Which one of the following correctly describes the biological hazard AND appropriate action to minimize the related exposure (ALARA)?

The biological hazard presented due to the leakage of fluid is PRIMARILY due to the presence of ...

- A. Cobalt-60 (particulate). Don a respirator.
- B. Cobalt-60 (particulate). Do not come into contact with the leaking fluid.
- C. Krypton-88 (gas). Don a respirator.
- D. Krypton-88 (gas). Do not come into contact with the leaking fluid.

**Answer:** B Cobalt-60 (particulate). Do not come into contact with the leaking fluid.

**Exam Bank No.:** 2075

**K/A Catalog Number:** 068 K5.04

**Tier:** 2 **Group/Category:** 2

**RO Importance:** 3.2 **10CFR Reference:** 55.41(b)(13)

Knowledge of the operational implications of the following concepts as they apply to the Liquid Radwaste System: Biological hazards of radiation and the resulting goal of ALARA.

**STP Lesson:** LOT 203.11 **Objective Number:** 101657

GIVEN an abnormal plant condition concerning equipment associated with the Liquid Waste Processing System (LWPS), DETERMINE the probable cause of the condition and any corrective actions necessary (if applicable).

**Reference:** LOT 203.11, LOT 507.01

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: Co-60 is one of the primary isotopes present in liquid radwaste. However, with such a small leak, there's negligible airborne therefore a respirator would not be required.
- B: CORRECT: Co-60 is one of the primary isotopes present in liquid radwaste. However, with such a small leak, there's negligible airborne therefore a respirator would not be required. The individual should remain clear of the fluid to prevent personal contamination.
- C: INCORRECT: Kr-88 is a primary isotope found in the Gaseous Waste Processing System, not Liquid Radwaste. Donning a respirator would be the correct action to minimize exposure if a gaseous mixture was present.
- D: INCORRECT: Kr-88 is a primary isotope found in the Gaseous Waste Processing System, not Liquid Radwaste. If Kr-88 were present, the appropriate action to minimize exposure would be to leave the area or don a respirator.

**Question Level:** F **Question Difficulty** 3

**Justification:**

Student must know what the primary isotopes are in the Liquid Radwaste System and what precautions should be taken to minimize the exposure effects.

**Exam Bank No.:** 581

**Last used on an NRC exam:** 1995

**RO Sequence Number:** 47

An operator is required to complete a valve lineup in an area where the radiation level is 50 mRem/hour. The operator's current Total Effective Dose Equivalent (TEDE) is 1250 mRem. How long can he work in this area before reaching STP's Administrative Action Level (AAL) for TEDE?

- A. 1 hour
- B. 5 hours
- C. 15 hours
- D. 65 hours

**Answer:** B 5 hours

**Exam Bank No.:** 581

**K/A Catalog Number:** G2.3.4                      **Tier:** 3    **Group/Category:**

**RO Importance:** 3.2    **10CFR Reference:** 55.41(b)(12)

Knowledge of radiation exposure limits under normal or emergency conditions.

**STP Lesson:** LOT 103.04    **Objective Number:** 91817

State the 10CFR20 and STP exposure limitations including extensions for the whole body, skin, and extremities for adults or minors.

**Reference:** LOT103.04, Rev 3, Principles of Exposure Control

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank                      **Modified from**

**Distractor Justification**

- A: INCORRECT: this answer would be correct if the AAL was 1300 mr.
- B: CORRECT - The STP AAL is 1500 mrem/year. The NRC limit is 5000 mrem/year.  $1500 - 1250 = 250$  mrem remaining.  $250 / 50$  mrem/hr = 5 hours remaining.
- C: INCORRECT: this answer would be correct if the AAL was 2000 mr which is the previous limit at STP.
- D: INCORRECT: this answer would be correct if the NRC limit of 5000 mr were used instead of the STP AAL.

**Question Level:** H                      **Question Difficulty** 3

**Justification:**

Student must know the appropriate exposure limits and be able to apply them to the given conditions.



**Exam Bank No.:** 2070

**Last used on an NRC exam:** Never

**RO Sequence Number:** 48

Regarding the Radiation Monitoring System console, (RM-11), a specific radiation monitor must first be selected before an operator can access monitor status and trend data (radiation or activity history):

Which one of the below correctly describes how an operator would select a specific monitor at the RM-11 console and how a selected monitor is displayed to the operator?

To select a specific radiation monitor on the currently displayed grid at the RM-11 console...

- A. key in the monitor number designator (e.g. 1311) that's on the specific monitor icon, then press the SEL key. A white border will appear around the monitor icon to indicate it has been selected.
- B. using the arrow keys on the RM-11 keyboard, position the screen cursor over the desired monitor then press the SEL key. A white border will appear around the monitor icon to indicate it has been selected.
- C. key in the monitor number designator (e.g. 1311) that's on the specific monitor icon, then press the SEL key. The monitor icon will begin flashing to indicate it has been selected.
- D. using the arrow keys on the RM-11 keyboard, position the screen cursor over the desired monitor then press the SEL key. The monitor icon will begin flashing to indicate it has been selected.

**Answer:** A key in the monitor number designator (e.g. 1311) that's on the specific monitor icon, then press the SEL key. A white border will appear around the monitor icon to indicate it has been selected.

**Exam Bank No.:** 2070

**K/A Catalog Number:** G2.3.5                      **Tier:** 3    **Group/Category:**

**RO Importance:** 2.9      **10CFR Reference:** 55.41(b)(11)

Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.

**STP Lesson:** LOT 202.41      **Objective Number:** 68793

Describe the meaning of the colors on the RM11 display.

**Reference:** LOT 202.41, OPOP04-RA-0001, Rev. 26

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New                      **Modified from**

**Distractor Justification**

- A: CORRECT: a specific monitor can be selected by keying in its designator or pressing the SEL PB until the desired rad monitor is selected. When a specific monitor is selected a white border appears around the monitor icon.
- B: INCORRECT: there is no 'cursor' on the RM-11 screen. The indication that a specific monitor has been selected is correct.
- C: INCORRECT: the method to select a specific monitor is correct, but the indication that a specific monitor has been selected is not correct.
- D: INCORRECT: neither the method to select a specific monitor is correct, nor is the indication that a specific monitor has been selected.

**Question Level:** F      **Question Difficulty** 3

**Justification:**

Student must know how to select a specific monitor on the Rad Monitor Console and be able to tell which monitor is selected for further inquiry.

**Exam Bank No.:** 2076

**Last used on an NRC exam:** Never

**RO Sequence Number:** 49

In which of the following situations would an AREA Radiation Monitor be expected to respond (i.e. upscale indication and alarms from high radiation levels in the area)?

1. Fuel handling accident during new fuel receipt in the FHB.
  2. Fuel handling accident during transport of spent fuel in the FHB.
  3. Loss of Coolant OUTSIDE of Containment due to small leak (approximately 1 drop per second) on the bottom of the Volume Control Tank (assume NO fuel failure).
  4. Loss of Coolant INSIDE of Containment due to a large break on RCS Loop 'A' (assume NO fuel failure).
- A. 1 and 2.
- B. 1 and 3.
- C. 3 and 4.
- D. 2 and 4.

**Answer:** D 2 and 4.

**Exam Bank No.:** 2076**K/A Catalog Number:** 072 G2.4.46 **Tier:** 2 **Group/Category:** 2**RO Importance:** 4.2 **10CFR Reference:** 55.41(b)(11)

Ability to verify that the alarms are consistent with the plant conditions.

**STP Lesson:** LOT 202.41 **Objective Number:** 92125

PREDICT the probable ARMS alarm(s) that would be energized under the following conditions:

- A. Loss-of-Coolant Accident (LOCA)
- F. Fuel Handling Accident in the Fuel Building

**Reference:** LOT 202.41**Attached Reference**  **Attachment:****NRC Reference Req'd**  **Attachment:****Source:** New **Modified from****Distractor Justification**

- A: INCORRECT: Rupture of a new fuel assembly would release primarily alpha particles to the immediate vicinity. Alpha particles dissipate their energy in short distances and are easily shielded, therefore the Area Rad monitors would not be expected to 'see' them. Rupture of a spent fuel assembly would be expected to create a response on the Area Rad Monitors in the vicinity.
- B: INCORRECT: Rupture of a new fuel assembly would release primarily alpha particles to the immediate vicinity. Alpha particles dissipate their energy in short distances and are easily shielded, therefore the Area Rad monitors would not be expected to 'see' them. Also, a small leak on the VCT wouldn't be expected to cause a response on the Area Rad Monitor system because there will be little if any airborne activity thus the general background radiation levels won't change.
- C: INCORRECT: A small leak on the VCT wouldn't be expected to cause a response on the Area Rad Monitor system because there will be little if any airborne activity thus the general background radiation levels won't change. A large LOCA inside containment would release large amounts of activity into the RCB atmosphere resulting in an increase in background radiation levels that would cause a response on the Area Rad monitors.
- D: CORRECT: Rupture of a spent fuel assembly would release high amounts of fission product activity to the atmosphere resulting in an increase in the background radiation levels in the area. A large LOCA inside containment would also release large amounts of activity into the RCB atmosphere resulting in an increase in background radiation levels that would cause a response on the Area Rad monitors.

**Question Level:** H **Question Difficulty** 3**Justification:**

Student must evaluate the accident response of each type of accident listed and determine if the Area Rad Monitor System would respond based on his/her knowledge of the Area Rad Monitor System.

**Exam Bank No.:** 2072

**Last used on an NRC exam:** Never

**RO Sequence Number:** 50

Given the following:

- Unit 1 was operating at full power when a control rod in Control Bank 'A' dropped fully into the core.
- The crew has entered 0POP04-RS-0001, Control Rod Malfunction, and have completed all steps necessary to begin withdrawal of the dropped rod.
- The Rod Bank Selector Sw. is in the Control Bank 'A' position

The OTHER control rods in Control Bank 'A' will not move as the dropped rod is withdrawn because the...

- A. Step Counters for Control Bank 'A' have NOT been reset.
- B. Pulse-to-Analog Converter for Control Bank 'A' is set to the current position of the remaining Control Bank 'A' rods.
- C. Lift Coil disconnect switches for the remaining Control Bank 'A' rods have been placed in the DISCONNECT position.
- D. dropped rod condition has created a rod block signal that only allows the remaining Control Bank 'A' rods to be inserted.

**Answer:** C Lift Coil disconnect switches for the remaining Control Bank 'A' rods have been placed in the DISCONNECT position.

**Exam Bank No.:** 2072

**K/A Catalog Number:** 001 K4.17

**Tier:** 2 **Group/Category:** 2

**RO Importance:** 2.9 **10CFR Reference:** 55.41(b)(6)

Knowledge of CRDS design feature(s) and/or interlock(s) which provide for the following: override (or bypass) for rod bank motion when one rod is bottomed.

**STP Lesson:** LOT 201.18 **Objective Number:** 91298

DESCRIBE the basic operation for picking up a dropped rod.

**Reference:** LOT 201.18, OPOP04-RS-0001, Rev. 30

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: The Step Counters do not have any control functions. Additionally, they are set at the position of the dropped rod rather than the previous position of the rod (i.e. they ARE 'reset').
- B: INCORRECT: The PA Converter is set to the dropped rod position, not the position of the remaining rods in the Control Bank. Additionally, the PA Converter does not perform any control functions for Rod Control.
- C: CORRECT: The Lift Coil Disconnect switches are placed in the DISCONNECT position to prevent the remaining control rods in the affected bank from moving as the dropped rod is withdrawn.
- D: INCORRECT: There are no rod block signals generated by the dropped rod condition. The rod block signals are generated from the NI system and generally have to do with a certain power level, not rod position.

**Question Level:** F **Question Difficulty** 3

**Justification:**

Student must know the control features of the rod control system and the process for recovering a dropped rod.

**Exam Bank No.:** 245

**Last used on an NRC exam:** Never

**RO Sequence Number:** 51

Unit 2 is operating at 100% power when the controlling level channel on SG 'A' fails to 100%.

Which one of the following correctly describes the plant response assuming NO operator action is taken?

- A. Feedwater flow to SG 'A' will INITIALLY go UP, then LOWER causing SG 'A' level to stabilize at a level HIGHER than program.
- B. Feedwater flow to SG 'A' will INITIALLY go DOWN, then RISE causing SG 'A' level to stabilize at a level LOWER than program
- C. The Reactor will trip on SG LO-LO level.
- D. The Reactor will trip due to a turbine trip on SG HI-HI level.

**Answer:** C The Reactor will trip on SG LO-LO level.

**Exam Bank No.:** 245

**K/A Catalog Number:** 035 A3.01                      **Tier:** 2    **Group/Category:** 2

**RO Importance:** 4.0            **10CFR Reference:** 55.41(b)(7)

Ability to monitor automatic operation of the S/G including: S/G water level control.

**STP Lesson:** LOT 202.15            **Objective Number:** 19370

DISCUSS the consequences of a loss of any one input to the S/G level control system.

**Reference:** LOT202.15

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank                      **Modified from**

**Distractor Justification**

- A: INCORRECT: When the controlling channel fails to 100% a level error is created that indicates the actual level is too high. This causes the MFRV to close, lowering FW flow, not raising it as indicated.
- B: INCORRECT: FW flow will lower as indicated, but will not come back up because the controlling channel is failed high and will not change with actual level.
- C: CORRECT: When the controlling channel fails to 100% a level error is created that indicates the actual level is too high. This causes the 'A' SG MFRV to close, lowering FW flow to 'A' SG. The lower FW flow will cause actual SG level to lower. Because the controlling channel is failed high and will not change with actual level, FW flow will continue to lower as will actual SG level. Eventually, a Rx trip will occur on SG LO-LO level.
- D: INCORRECT: Actual SG level will lower, not rise, therefore a SG Isolation on Hi-Hi level will not occur.

**Question Level:** H            **Question Difficulty** 3

**Justification:**

Student must be able to determine how the SG level control system responds to the indicated failure.



**Exam Bank No.:** 2085

**Last used on an NRC exam:** Never

**RO Sequence Number:** 52

Given the following:

- Unit 2 is shutting down for a refueling outage.
- Unit 2 is currently at 5% power.
- Steam Dumps are in the steam pressure mode.
- Steam Generators are being supplied by the Startup Feedpump (SUFPP).

An overcurrent trip occurs on the SUFP.

INITIALLY, RCS temperature will ...

- A. rise due to the loss of main feedwater, then return to the previous value due to the action of the Steam Dumps.
- B. lower due to the automatic Reactor Trip that has just occurred, then return to the previous value due to decay heat.
- C. remain the same due to the automatic start of the AFW Pumps.
- D. lower due to the automatic start of the AFW Pumps, then rise due to action of the Steam Dumps.

**Answer:** A rise due to the loss of main feedwater, then return to the previous value due to the action of the Steam Dumps.

**Exam Bank No.:** 2085

**K/A Catalog Number:** 059 K3.04

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 3.6 **10CFR Reference:** 55.41(b)(5)

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

**STP Lesson:** LOT 204.01 **Objective Number:** 20401

Given plant or system conditions, predict the response of the plant and/or systems.

**Reference:** LOT 202.28, LOT 202.13

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: CORRECT: Due to the loss of cooler feedwater flow into the steam generators, RCS temperature will initially rise. Rising RCS temperature will cause steam generator pressure to rise, steam dumps to open to reduce pressure back to setpoint (and RCS temperature back to the original value).
- B: INCORRECT: An automatic trip is not generated directly from the loss of the SUFP. Steam generator level will have to lower from 70% to 20% before a trip will occur which will take considerable time (and therefore is not the initial response).
- C: INCORRECT: There is not a direct AFW start signal from loss of main feedwater. The AFW pumps will start when steam generator level reaches 20% (and is therefore also not an initial response)
- D: INCORRECT: Even though temperature may lower after an AFW actuation due to the introduction of cold water into the steam generators. As explained above, this would not be an initial response.

**Question Level:** H **Question Difficulty** 3

**Justification:**

Applicant must use integrated plant knowledge and have an understanding of the thermodynamic processes involved to determine the initial RCS response to a loss of all main feedwater.

**Exam Bank No.:** 2081

**Last used on an NRC exam:** Never

**RO Sequence Number:** 53

Given the following:

- Unit 1 is operating at full power.
  - All systems are in their normal lineup for the current power level.
  - Unbeknown to the operators, gas voids have formed in the piping for a HHSI Pump.
- Which one of the following correctly describes the potential effect of these voids and the appropriate action to remove them?

Water hammer might occur due to the gas voids in the HHSI Pump piping which could potentially lead to \_\_\_\_\_. To remove the voids, \_\_\_\_\_ in accordance with the periodic Surveillance Procedure designed to ensure the system is kept full.

	Potential Result	Corrective Action
A	damage to the HHSI Pump discharge piping that could result in a break/leak	vent the pump and discharge line
B	damage to the HHSI Pump discharge valve preventing it from automatically opening after the pump starts	run the pump on recirc.
C	damage to the HHSI Pump discharge piping that could result in a break/leak	run the pump on recirc
D	damage to the HHSI Pump discharge valve preventing it from automatically opening after the pump starts	vent the pump and discharge line.

**Answer:** A damage to the HHSI Pump discharge piping that could result in a break/leak; Vent the pump and discharge line

**Exam Bank No.:** 2081

**K/A Catalog Number:** 006 A2.06

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 3.3 **10CFR Reference:** 55.41(b)(7)

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

**STP Lesson:** LOT 102.57 **Objective Number:** N99862

Explain operational implications of water (fluid) hammer.

**Reference:** LOT 102.57, 0PSP03-SI-0014, Rev.12

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: CORRECT: Water hammer can lead to pipe damage resulting in fluid leakage. The procedure referenced requires venting the pump vs running it to remove the voids.
- B: INCORRECT: Although valve damage could occur due to water hammer, the HHSI pump discharge valves are normally open and have no automatic features. The procedure referenced requires venting the pump vs running it to remove the voids.
- C: INCORRECT: Water hammer can lead to pipe damage resulting in fluid leakage. The procedure referenced requires venting the pump vs running it to remove the voids..
- D: INCORRECT: Although valve damage could occur due to water hammer, the HHSI pump discharge valves are normally open and have no automatic features. The procedure referenced requires venting the pump vs running it to remove the voids.

**Question Level:** F **Question Difficulty** 3

**Justification:**

Student must have knowledge of the effects of voids in a pump discharge line and the corrective action to remove them.

**Exam Bank No.:** 2082

**Last used on an NRC exam:** Never

**RO Sequence Number:** 54

Given the following:

- An RCS LOCA has occurred in Unit 1.
- RCS pressure is 510 psig, lowering.
- Pressurizer level is 40%, rising.
- RCS temperature is 472 °F, lowering.
- HHSI Pumps and CCP's are secured.
- RWST level is 50,000 gallons and stable.
- Containment pressure is 4 psig and stable.

Based on the given conditions, the operator can validate the LHSI Control Board indications he/she is observing by determining the LHSI Pumps ....

- A. ARE providing flow into the RCS because Pressurizer level is rising.
- B. ARE providing flow into the RCS because RCS temperature is lowering.
- C. are NOT providing flow into the RCS because RCS pressure is too high.
- D. are NOT providing flow into the RCS because RWST Swapover has occurred.

**Answer:** C are NOT providing flow into the RCS because RCS pressure is too high.

**Exam Bank No.:** 2082

**K/A Catalog Number:** 006 G2.1.45      **Tier:** 2      **Group/Category:** 1

**RO Importance:** 4.3      **10CFR Reference:** 55.41(b)(7)

Ability to identify and interpret diverse indications to validate the response of another indication.

**STP Lesson:** LOT 201.10      **Objective Number:** 29419

GIVEN a plant condition, PREDICT the operation of the ECCS to include automatic actuations, interlocks and/or trips.

**Reference:** LOT 201.10

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified from**

**Distractor Justification**

- A: INCORRECT: RCS pressure is above the shutoff head of the LHSI pumps therefore they are not providing flow to the RCS. Pressurizer level is rising because the RCS is saturated.
- B: INCORRECT: RCS pressure is above the shutoff head of the LHSI pumps therefore they are not providing flow to the RCS. RCS temperature is lowering because the RCS is at saturation and RCS pressure is lowering.
- C: CORRECT: RCS pressure is above the shutoff head of the LHSI pumps therefore they are not providing flow to the RCS.
- D: INCORRECT: RWST Swapover HAS occurred, but that is not the reason the LHSI pumps are not providing flow to the RCS. It's because RCS pressure is greater than the shutoff head of the pumps.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

Student must be able to determine LHSI pump flow status based on a set of given plant conditions.

**Exam Bank No.:** 2107

**Last used on an NRC exam:** Never

**RO Sequence Number:** 55

Given the following:

- Unit 1 has tripped from full power.
- A Safety Injection (SI) has actuated from Low Pressurizer Pressure.
- The crew is performing the actions of 0POP05-EO-EC12, LOCA Outside Containment.
- Plant conditions indicate the LOCA is in the Fuel Handling Bldg. (FHB).
- RWST level = 150,000 gallons.
- The Train A, B, and C SI RESET/BLOCK Pushbuttons on CP-001 have been used to reset/block the SI signal going to each equipment train.
- All Train Load Sequencers have been reset at Control Room Panel CP-003.

The Unit Supervisor directs the Reactor Operator to perform procedure step 2:  
RESET SI AUTO RECIRC.

Which one of the below correctly describes the plant status and the effect of performing this procedure step?

Auto Recirc Swapover ...

- A. HAS occurred. Resetting SI AUTO RECIRC will allow the ECCS pumps to be manually stopped by the Control Room operator.
- B. HAS occurred. Resetting SI AUTO RECIRC will allow manual operation of the Emergency Sump Outlet valves (MOV-00016A,B,C) by the Control Room operator.
- C. has NOT yet occurred. Resetting SI AUTO RECIRC will ensure the ECCS pumps remain secured once they've been stopped by the Control Room operators.
- D. has NOT occurred. Resetting SI AUTO RECIRC will ensure the Emergency Sump Outlet valves (MOV-00016A,B,C) remain closed.

**Answer:** D has NOT occurred. Resetting SI AUTO RECIRC will ensure the Emergency Sump Outlet valves (MOV-00016A,B,C) remain closed.

**Exam Bank No.:** 2107

**K/A Catalog Number:** EPE W/E04 EK2.1      **Tier:** 1      **Group/Category:** 1

**RO Importance:** 3.5      **10CFR Reference:** 55.41(b)(7)

Knowledge of the interrelations between the (LOCA Outside Containment) and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

**STP Lesson:** LOT 201.10      **Objective Number:** 29419

GIVEN a plant condition, PREDICT the operation of the ECCS to include automatic actuations, interlocks and/or trips.

**Reference:** OPOP05-EO-EC12, Rev. 8; LOT 201.10

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified from**

**Distractor Justification**

- A: INCORRECT: Auto Recirc Swapover has NOT occurred because it occurs at 75,000 gallons in the RWST. The purpose of resetting the circuit is incorrect because the swapover circuit has nothing to do with the ECCS pumps. Additionally, placing these pumps to PTL will stop them regardless of what other control signals may be present.
- B: INCORRECT: Auto Recirc Swapover has NOT occurred because it occurs at 75,000 gallons in the RWST. The purpose of resetting the circuit is true if swapover had occurred.
- C: INCORRECT: It's correct that auto recirc swapover has not yet occurred, but the reason for doing the reset has nothing to do with the ECCS pumps. These pumps are controlled by the Sequencers and the Train SI signal.
- D: CORRECT: The SI AUTO RECIRC logic controls certain valves to automatically perform an ECCS pump suction source swapover from the RWST to the Containment Emergency Sumps. This swapover occurs at 75,000 gallons in the RWST so it has not yet occurred. By resetting the SI AUTO RECIRC logic before swapover occurs, the circuit is prevented from doing a swapover thereby keeping the Emergency Sump Outlet Valves closed if they were closed for leak isolation in EC12.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

Student must know the control features of the ECCS and be able to use them to predict their effect when used under the given plant conditions.



**Exam Bank No.:** 2083**Last used on an NRC exam:** Never**RO Sequence Number:** 56

Given the following:

- Unit 1 is operating at 100% power.
- One (1) channel of the Pressurizer Pressure Low Reactor Trip function in the Solid State Protection System (SSPS) failed a week ago.
- The bistable for this Reactor trip function has been placed in the TRIPPED condition to comply with Tech Specs.

Which one of the following correctly describes the NORMAL trip logic for the Pressurizer Pressure Low Reactor Trip function and what the EFFECTIVE trip logic is now under the conditions described above?

	NORMAL trip logic for the Low Pressurizer Pressure Reactor Trip	EFFECTIVE trip logic under the given conditions
A	2/4	1/3
B	2/4	2/4
C	2/3	1/3
D	2/3	2/3

**Answer:** A 2/4; 1/3

**Exam Bank No.:** 2083

**K/A Catalog Number:** 013 K5.02

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 2.9 **10CFR Reference:** 55.41(b)(7)

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

**STP Lesson:** LOT 201.20 **Objective Number:** 507227

Given a description of plant conditions, ANALYZE the conditions and PREDICT how the Solid State Protection System will respond.

**Reference:** LOT 201.30

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: CORRECT: 2-of-4 logic is the normal trip logic for the Low Pressurizer Pressure Rx trip. Having one channel in the tripped condition will represent a half-trip situation where only 1 of the remaining 3 operable channels must trip to get a Reactor trip, therefore the effective trip logic is 1/3.
- B: INCORRECT: The normal trip logic is 2/4 as stated, however the 'effective' trip logic becomes 1/3 because only 1 of 3 remaining channels needs to trip to get the Rx trip.
- C: INCORRECT: The normal trip logic is 2/4, not 2/3 although there are some Rx trips and/or ESFAS actuations that use 2/3. The 'effective' trip logic is correct for the given conditions.
- D: INCORRECT: The normal trip logic is 2/4, not 2/3 although there are some Rx trips and/or ESFAS actuations that use 2/3. The 'effective' trip logic is also incorrect for the given conditions as it will take only 1 of the 3 remaining channels to get a Rx trip.

**Question Level:** H **Question Difficulty** 3

**Justification:**

Student must have knowledge of the logic features of the ESFAS/RPS and how logic changes when channels are placed in the tripped condition.

**Exam Bank No.:** 2110

**Last used on an NRC exam:** Never

**RO Sequence Number:** 57

Which one of the following correctly describes how the P-4 signal is used?

The presence of a P-4 signal is necessary to...

- A. have an automatic SI actuation.
- B. use the SI RESET (BLOCK) pushbuttons on CP-001 to manually reset/block a Safety Injection signal to ESF Train equipment.
- C. have an automatic AMSAC actuation.
- D. use the Sequencer RESET pushbuttons on CP-003 to manually reset a Mode 1 signal to the Train ESF Load Sequencers.

**Answer:** B use the SI RESET (BLOCK) pushbuttons on CP-001 to manually reset/block a Safety Injection signal to ESF Train equipment.

**Exam Bank No.:** 2110

**K/A Catalog Number:** 012 K1.05

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 3.8 **10CFR Reference:** 55.41(b)(7)

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

**STP Lesson:** LOT 201.20 **Objective Number:** 3832

DESCRIBE the reactor protection system control and permissive interlocks including inputs, setpoints, coincidence, and functions.

**Reference:** LOT 201.20

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: The SI actuation logic uses the P-4 signal as part of the reset logic, not part of the actuation logic expect for a FW Isolation with low Tave.
- B: CORRECT: There must be a P4 signal present to enable the SI RESET/BLOCK PB's which allow the SI signal to be blocked to the train components so operator control can be regained.
- C: INCORRECT: There is no connection between the AMSAC logic and the Safety Injection actuation or reset logic..
- D: INCORRECT: The Sequencer logic does not use any SI signals from either the SI actuation logic or the SI reset logic.

**Question Level:** F **Question Difficulty** 3

**Justification:**

Student must know the role Permissive P4 plays within the SI actuation and reset logic.

**Exam Bank No.:** 2091

**Last used on an NRC exam:** Never

**RO Sequence Number:** 58

Given the following:

- Unit 1 Reactor has been tripped from 100% power and the Control Room evacuated due to smoke in the Control Room.
- All plant systems have operated as designed.
- ALL steps of OPOP04-ZO-0001, Control Room Evacuation, required to be performed PRIOR to leaving the Control Room have been successfully completed.
- No equipment has yet been placed in service from outside the Control Room.

The Steam Generators (SG's)...

- A. ARE available as a heat sink because Main Feedwater is still in service and the Steam Dumps can be controlled from the Aux Shutdown Panel.
- B. ARE available as a heat sink because the AFW system has automatically started and the SG PORV's are capable of performing their design function.
- C. are NOT available as a heat sink because there is currently no feedwater source for the SG's AND there is no power available to the SG PORV's.
- D. are NOT available as a heat sink because all SG levels have shrunk below 14% NR level and the AFW pumps will not automatically start.

**Answer:** B ARE available as a heat sink because the AFW system has automatically started and the SG PORV's are capable of performing their design function.

**Exam Bank No.:** 2091

**K/A Catalog Number:** APE 068 AA2.05      **Tier:** 1      **Group/Category:** 2

**RO Importance:** 4.3      **10CFR Reference:** 55.41(b)(4)

Ability to determine and/or interpret the following as they apply to the Control Room Evacuation:  
Availability of heat sink.

**STP Lesson:** LOT 505.01      **Objective Number:** 92108

Given a plant condition, STATE the actions required to be performed per the applicable Off-Normal procedure.

**Reference:** LOT 505.01, OPOP04-ZO-0001, Rev. 32

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified from**

**Distractor Justification**

- A: INCORRECT: MFW was isolated and the MSIV's were closed before evacuating the Control Room. Additionally, the Steam Dumps do not have controls on the Aux Shutdown Panel.
- B: CORRECT: Immediately after the Rx is tripped, AFW will start on LO-LO SG levels and begin feeding the SG's. Before leaving the Control Room, the MSIV's were closed so the SG's will steam thru the SG PORV's as SG pressure rises.
- C: INCORRECT: AFW will automatically start immediately after the Rx trip due to LO-LO SG levels. Additionally, the SG PORV's do have power available and can function to remove heat.
- D: INCORRECT: SG levels will shrink below 14% NR as stated, but the AFW system will automatically start and provide water to the SG's. The AFW pumps will automatically start immediately after the Rx trip due to LO-LO SG levels. If the controls for AFW have been transferred out of the Control Room there would be no automatic AFW starts, but this action is taken after the Control Room is evacuated therefore the AFW system will automatically start on SG LO-LO level.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

Student must use knowledge of actions taken before evacuating the control room and what controls are on the Aux Shutdown Panel to determine SG heat sink availability under the given plant conditions.

**Exam Bank No.:** 2105

**Last used on an NRC exam:** Never

**RO Sequence Number:** 59

Given the following:

- Unit 2 has experienced a loss of ONE Vital 120 VAC Bus while operating at power.
- The crew is performing the actions of 0POP04-VA-0001, Loss of 120 VAC Class Vital Distribution.
- Charging Flow Controller, FK-0205, HAS FAILED.
- Charging Flow = 0 gpm.
- CCP 'A' is running
- Letdown Flow = 120 gpm.
- The controlling Pressurizer Level channel has NOT FAILED.

In accordance with 0POP04-VA-0001, which one of the following correctly describes the method used to control Pressurizer level?

Maintain Pressurizer level by...

- A. taking manual control of Pressurizer LEVEL CONT LK-0655.
- B. starting the CVCS PDP and use it's recirc valve to raise RCP seal injection flow.
- C. isolating Charging and Letdown, then using Seal Injection flow and Excess Letdown.
- D. placing one or more Letdown Orifices in service, as needed.

**Answer:** C isolating Charging and Letdown, then using Seal Injection flow and Excess Letdown.

**Exam Bank No.:** 2105

**K/A Catalog Number:** APE 057 AA1.02      **Tier:** 1      **Group/Category:** 1

**RO Importance:** 3.8      **10CFR Reference:** 55.41(b)(10)

Ability to operate and/or monitor the following as they apply to the Loss of Vital AC Instrument Bus:  
Manual control of PZR level.

**STP Lesson:** LOT 505.01      **Objective Number:** 92108

Given a plant condition, DESCRIBE and/or INTERPRET the requirements and/or limits of a precaution or step of a referenced procedure.

**Reference:** OPOP04-VA-0001, Rev. 24

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified from**

**Distractor Justification**

- A: INCORRECT: This controller is electrically upstream of the failed Charging Flow Controller therefore it will have no effect on actual charging flow.
- B: INCORRECT: Seal Injection flow can be used to some degree to offset letdown flow for inventory control, but seal injection won't cool the letdown flow in the Non-Regen Hx. Additionally, the amount of seal injection flow that could be established will not be enough to stabilize pressurizer level. And finally, with a CCP already running that can be used to supply additional seal injection flow there is no reason to use the PDP.
- C: CORRECT: If charging flow is lost or the Charging Flow Controller (FK-0205) has failed, normal Letdown must be isolated. To control Pressurizer level, Excess Letdown must be placed in service to offset seal injection flow.
- D: INCORRECT: Charging flow is lost therefore there is no cooling of Letdown flow in the Regenerative Hx so Letdown must be isolated, not lowered by using the Letdown Orifices. Once Letdown is isolated, the RCP seal injection flow will cause Pressurizer level to rise. To offset this effect, Excess Letdown must be placed in service.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

Student must be able to determine which method of controlling Pressurizer level is called for based on the given plant conditions.



**Exam Bank No.:** 13**Last used on an NRC exam:** 2007**RO Sequence Number:** 60

During the performance of 0POP05-EO-ES12, Post LOCA Cooldown and Depressurization, the operator is directed to STOP the LHSI Pumps and place them in AUTO if RCS pressure is greater than 415 psig and stable or rising.

Assuming the LHSI Pumps have been stopped based on the above conditions, which one of the following correctly describes the use of the LHSI Pumps for subsequent recovery actions as 0POP05-EO-ES12 is performed?

- A. LHSI Pumps are no longer required, even if RCS pressure drops uncontrollably, because the RHR System will be available to be placed in service.
- B. LHSI Pumps are no longer required, even if RCS pressure drops uncontrollably, because HHSI Pumps will be capable of providing sufficient flow to remove decay heat.
- C. If RCS pressure drops in an uncontrolled manner to less than 415 psig, the ESF Load Sequencer will restart the LHSI pumps.
- D. If RCS pressure drops in an uncontrolled manner to less than 415 psig, the operator will be required to manually restart the LHSI pumps.

**Answer:** D If RCS pressure drops in an uncontrolled manner to less than 415 psig, the operator will be required to manually restart the LHSI pumps

**Exam Bank No.:** 13

**K/A Catalog Number:** EPE W/E03 EK1.2      **Tier:** 1      **Group/Category:** 2

**RO Importance:** 3.6      **10CFR Reference:** 55.41(b)(10)

Knowledge of the operational implications of the following concepts as they apply to the (LOCA Cooldown and Depressurization): Normal, abnormal, and emergency operating procedures associated with (LOCA Cooldown and Depressurization)

**STP Lesson:** LOT 504.12      **Objective Number:** 92173

From memory STATE/IDENTIFY the criteria on the conditional information page of 0POP05-EO-ES12 to include operator response, initiating parameter(s) and values.

**Reference:** 0POP05-EO-ES12, Rev 15

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank      **Modified from**

**Distractor Justification**

- A: INCORRECT - While the second half of the statement may be true, the conditional information page requires the pumps be started in this condition.
- B: INCORRECT - While the second half of the statement may be true, the conditional information page requires the pumps be started in this condition.
- C: INCORRECT - Low RCS pressure is not one of the signals upon which the sequencer will start the pumps, they must be restarted manually.
- D: CORRECT - Per the conditional information page, the pumps must be started by the operators.

**Question Level:** F      **Question Difficulty** 3

**Justification:**

Candidate must have knowledge of the requirements to re-start the LHSI pumps if RCS pressure uncontrollably lowers below 415 psig.

**Exam Bank No.:** 2114

**Last used on an NRC exam:** Never

**RO Sequence Number:** 61

Given the following:

- Unit 1 has experienced a Reactor trip and Safety Injection actuation.
- All systems operated as designed.

Which one of the following correctly describes the indications received in the Control Room when Phase 'A' Isolation is reset?

- A. The PHASE A NOT RESET Annunciator on CP-002 will clear (begin blinking if it was in an acknowledged state) AND on the CONTAINMENT ISOLATION PHASE A/B Panels, ONLY the red 'PHASE A ISOL' status lights will go out.
- B. On the CONTAINMENT ISOLATION PHASE A/B Panels, the red 'PHASE A ISOL' status lights AND any F/ACT lights associated with Phase 'A' Isolation that were lit on these panels will go out.
- C. On the CONTAINMENT ISOLATION PHASE A/B Panels, the red 'PHASE A ISOL' status lights AND any BYP/INOP lights associated with Phase 'A' Isolation that were lit on these panels will go out.
- D. On the CONTAINMENT ISOLATION PHASE A/B Panels, ONLY the red 'PHASE A ISOL' status lights will go out.

**Answer:** B On the CONTAINMENT ISOLATION PHASE A/B Panels, the red 'PHASE A ISOL' status lights AND any F/ACT lights associated with Phase 'A' Isolation that were lit on these panels will go out.

**Exam Bank No.:** 2114

**K/A Catalog Number:** 103 A4.04

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 3.5 **10CFR Reference:** 55.41(b)(7)

Ability to manually control and/or monitor in the control room: Phase A and phase B resets.

**STP Lesson:** LOT 201.21 **Objective Number:** 80160

STATE the instrumentation and controls available to monitor and operate the Containment Isolation System.

**Reference:** LOT 201.21

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: There is no 'PHASE 'A' NOT RESET' Annunciator in the Control Room. Additionally, this distracter doesn't include the F/ACT lights associated with Phase 'A' Isolation that will also go out.
- B: CORRECT: Resetting Phase 'A' Isolation will yield the indications provided in answer 'B'.
- C: INCORRECT: The Byp/Inop lights on the status monitoring panels will function at all times therefore they will not clear or go out when any safeguards actuaion signals are reset.
- D: INCORRECT: This distracter doesn't include the F/ACT lights associated with Phase 'A' Isolation that will also go out.

**Question Level:** F

**Question Difficulty** 3

**Justification:**

Student must know the indications received to show that Phase 'A' Isolation has reset after using the manual reset PB's.

**Exam Bank No.:** 1373

**Last used on an NRC exam:** 2007

**RO Sequence Number:** 62

You are performing the actions of Addendum 5, Verification of SI Equipment Operation of OPOP05-EO-EO00, Reactor Trip or Safety Injection.

At Step 6, VERIFY Containment Isolation Phase 'A', on the ESF Status Panel, you note the following on the CONTAINMENT ISOLATION PHASE A/B status monitoring panel:

- Train 'A' PHASE A ISOL red light ON
- Train 'B' PHASE A ISOL red light ON
- Train 'C' PHASE A ISOL red light OFF
- Train 'A' white lights all OFF
- Train 'B' white lights all OFF
- Train 'C' white lights all OFF

Which one of the following correctly describes the probable failure AND action necessary to address the failure?

- A. Trains 'A' and 'B' failed to actuate. No further action is required because no white lights are lit indicating that no valves are out of position.
- B. Trains 'A' and 'B' failed to actuate. Manually Actuate Phase 'A' and verify/ensure all valves associated with the trains that failed to actuate are closed.
- C. Train 'C' failed to actuate. No further action is required because no white lights are lit indicating that no valves are out of position.
- D. Train 'C' failed to actuate. Manually actuate Phase 'A' and verify/ensure all valves associated with the Train 'C' Phase 'A' actuation are closed.

**Answer:** D Train 'C' failed to actuate. Manually actuate Phase 'A' and verify/ensure all valves associated with the Train 'C' Phase 'A' actuation are closed.

**Exam Bank No.:** 1373

**K/A Catalog Number:** 013 A4.01

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 4.5 **10CFR Reference:** 55.41(b)(7)

Ability to manually operate and/or monitor in the control room: ESFAS-initiated equipment which fails to actuate.

**STP Lesson:** LOT 504.05 **Objective Number:** 80483

Given a copy of a subsequent step or from memory an immediate action step from POP05-EO-EO00, STATE/IDENTIFY how the action is performed and the basis for the action to include the action itself, its purpose and result.

**Reference:** POP05-EO-EO00, Rev 21, LOT201.22

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank

**Modified from**

**Distractor Justification**

- A: INCORRECT - Red lights lit indicates the actuation signal is present. White lights only provide accurate indication once the actuation has occurred, If an actuation is present (red light/s) and the white lights are all out, it means all valves are in their correct position.
- B: INCORRECT - Red lights lit indicates the actuation signal is present, therefore there is no fail to actuate condition. The action indicated is correct if a failure to actuate had occurred.
- C: INCORRECT - If the red light is not lit, then the white lights do not provide status indication. There has to be an actuation signal present for the white lights to show any status.
- D: CORRECT - The lack of red light indicates the Train 'C' actuation did not occur. The operator must perform a manual actuation of Phase 'A' and verify valves are closed.

**Question Level:** H **Question Difficulty** 3

**Justification:**

The student must first determine the meaning of the light indication given in the stem. Then using their knowledge of procedural requirements, determine the correct course of action for the condition given.

**Exam Bank No.:** 1596

**Last used on an NRC exam:** Never

**RO Sequence Number:** 63

0POP05-EO-FRZ1, Response to High Containment Pressure, contains the caution:

“If 0POP05-EO-EC11, Loss of Emergency Coolant Recirculation, is in effect, THEN containment spray should be operated as directed in 0POP05-EO-EC11 .....””

Which one of the following describes the basis for operating Containment Spray Pumps per EC11?

The reason the Containment Spray Pumps are operated by the guidance in EC11 is to...

- A. ensure the operating SI Pumps have sufficient NPSH while aligned to the Containment Emergency Sumps.
- B. stop the Containment Spray pumps now to ensure their availability after cold-leg recirculation cooling is established.
- C. reduce Containment Spray flow in order to conserve RWST level.
- D. prevent automatic Containment Spray Pump re-alignment to the Containment Emergency Sumps.

**Answer:** C reduce Containment Spray flow in order to conserve RWST level.

**Exam Bank No.:** 1596

**K/A Catalog Number:** APE 069 AK3.01      **Tier:** 1      **Group/Category:** 2

**RO Importance:** 3.8      **10CFR Reference:** 55.41(b)(10)

Knowledge of the reasons for the following responses as they apply to the Loss of Containment Integrity:  
Guidance contained in EOP for loss of containment integrity.

**STP Lesson:** LOT 504.40      **Objective Number:** 84127

Given a copy of a step, caution, or note from POP05-EO-FRZ1, STATE/IDENTIFY how the action is performed and the basis for the step, caution or note to include its purpose and the adverse impact of failure to comply with the step, caution or note.

**Reference:** 0POP05-EO-FRZ1, Rev. 8

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank      **Modified from**

**Distractor Justification**

- A: INCORRECT: This is not the specified reason in the EOP guidelines
- B: INCORRECT: This is not the specified reason in the EOP guidelines
- C: CORRECT: This is the specified reason in the EOP guidelines. If a LOCA Outside Containment is present, water from the RWST is being lost outside of Containment. When RWST level reaches the LO-LO level, an automatic swapover to the Containment Emergency Sumps will occur. However, if the RWST water has been lost outside of Containment, there will be no water in the Containment Emergency Sumps for the SI pumps to provide core cooling with. By minimizing the # of CS pumps operating, it will prolong the time for the RWST to reach the LO-LO level. Time that can be spent providing makeup to the RWST and possibly isolating the LOCA outside of Containment.
- D: INCORRECT: This is not the specified reason in the EOP guidelines

**Question Level:** F      **Question Difficulty** 3

**Justification:**

Student must know the basis of the cited CAUTION in FRZ1.



**Exam Bank No.:** 957**Last used on an NRC exam:** Never**RO Sequence Number:** 64

A Reactor Operator (normally working a 12-hour shift) has worked the following hours (excluding turnover) on the dates indicated:

<u>DATE</u>	<u>HOURS WORKED</u>
9/13/2011	0600 through 2000
9/14/2011	0600 through 1900
9/15/2011	0600 through 2200
9/16/2011	0600 through 2000
9/17/2011	0600 through 2400

Based on ONLY the work periods shown above, which one of the following is the date on which this operator FIRST exceeded the overtime limitations of OPGP03-ZA-01 14, Fatigue Rule Program?

- A. 9/13/2011
- B. 9/14/2011
- C. 9/15/2011
- D. 9/17/2011

**Answer:** B 9/14/2011

**Exam Bank No.:** 957

**K/A Catalog Number:** G2.1.5                      **Tier:** 3    **Group/Category:**

**RO Importance:** 2.9      **10CFR Reference:** 55.41(b)(10)

Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.

**STP Lesson:** LOT 507.01      **Objective Number:** 92186

Given the title of an Administrative Procedure, discuss the requirements associated with the referenced procedure.

**Reference:** OPGP03-ZA-0114, Rev. 2

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank                      **Modified from**

**Distractor Justification**

- A: INCORRECT: he worked 14 hr. on 9/13 and the limit is 16 hr. so there were no violations on 9/13.
- B: CORRECT: a total of 27 hrs. were worked on 9/13 and 9/14. The limit for hrs. worked in a 48 hr. period is 26 hrs. therefore he violated this requirement.
- C: INCORRECT: he violated the limit for # of hrs. worked in a 48 hr. period, but he had already violated the 48 hr. limit on 9/14 so this occasion was not the first occasion of a violation.
- D: INCORRECT: he violated the allowed # of hrs. worked in a 7 day period after working on 9/17, but this occasion was not the first occasion of a violation.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

student must assimilate the given information and determine the occasions of violation/s based on his/her knowledge of work hr. restrictions.

**Exam Bank No.:** 2093

**Last used on an NRC exam:** Never

**RO Sequence Number:** 65

Given the following:

- Unit 1 was tripped from 100% power due to a FAULTED SG condition.
- The crew is performing the actions of 0POP05-EO-FRP1, Response to Imminent Pressurized Thermal Shock Condition, Step 6, Check if SI Flow Should be Terminated.
- RCS pressure is 1400 psig.
- All HHSI and LHSI Pumps are running.
- NO RCP's are running.
- RVWL = 90%
- Charging is NOT in service

Based on these plant conditions, which one of the below correctly describes how securing the SI pumps will affect the severity of the PTS condition?

The severity of the PTS condition will be....

- A. LESS if only the LHSI Pumps are secured because not as much relatively cold water will be entering the RCS.
- B. LESS if only the HHSI Pumps are secured because NO relatively cold water will be entering the RCS.
- C. GREATER if only the LHSI Pumps are secured because RCS pressure will lower allowing more flow from the HHSI Pumps.
- D. GREATER if only the HHSI Pumps are secured because the LHSI Pumps are providing water to the RCS at a much greater flowrate than the HHSI Pumps.

**Answer:** B LESS if only the HHSI Pumps are secured because NO relatively cold water will be entering the RCS.

**Exam Bank No.:** 2093

**K/A Catalog Number:** EPE W/E08 EA1.2      **Tier:** 1      **Group/Category:** 2

**RO Importance:** 3.6      **10CFR Reference:** 55.41(b)(5)

Ability to operate and/or monitor the following as they apply to the (Pressurized Thermal Shock):  
Operating behavior characteristic of the facility.

**STP Lesson:** LOT 504.38      **Objective Number:** 83456

Given a copy of a step, caution or note from POP05-EO-FRP1, STATE/IDENTIFY how the action is performed and the basis for the step, caution or note to include its purpose and the adverse impact of failure to comply with the step, caution, or note.

**Reference:** LOT 504.38, LOT 201.10

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified from**

**Distractor Justification**

- A: INCORRECT: RCS pressure is above the LHSI pump shutoff head therefore securing these pumps will not have any effect on RCS conditions.
- B: CORRECT: Securing the HHSI pumps will stop the addition of any cold water from entering the RCS because RCS pressure is above the shutoff head of the LHSI Pumps and Charging is not in service.
- C: INCORRECT: RCS pressure is above the LHSI pump shutoff head therefore securing these pumps will not have any effect on RCS conditions.
- D: INCORRECT: securing HHSI pumps will lessen the severity of the PTS condition, not make it greater. Also, RCS pressure is greater than the shutoff head of the LHSI pumps so they will not be adding any water to the RCS.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

Student must be able to determine the effect of securing LHSI or HHSI has on the PTS condition using the given information.

**Exam Bank No.:** 2096

**Last used on an NRC exam:** Never

**RO Sequence Number:** 66

Given the following:

- Unit 1 tripped from 100% power.
- RCS Tave is 567 °F and stable.
- Pressurizer pressure is 1737 psig and lowering.
- Pressurizer level is 45% and rising.
- Containment pressure is 0.1 psig and stable.
- PRT pressure is 20 psig and rising.

Which one of the following events has likely occurred?

- A. Steam Generator feedwater line break outside Containment.
- B. Charging flow control valve, FCV-0205, failed open.
- C. A Pressurizer PORV has failed open.
- D. Steam Generator steamline break outside Containment.

**Answer:** C A Pressurizer PORV has failed open.

**Exam Bank No.:** 2096

**K/A Catalog Number:** EPE 008 AK2.01      **Tier:** 1      **Group/Category:** 1

**RO Importance:** 2.7      **10CFR Reference:** 55.41(b)(5)

Knowledge of the interrelations between the Pressurizer Vapor Space Accident and the following: Valves.

**STP Lesson:** LOT 501.21      **Objective Number:** 501215

Given a set of conditions or event description, be able to PREDICT the sequence of events and trends of plant parameters for a transient or accident involving a decrease in Reactor Coolant Inventory.

**Reference:** LOT j501.21

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified from**

**Distractor Justification**

- A: INCORRECT: a SG feedline break outside of containment would be an overcooling type of event, however RCS temperature is stable, not going down. Additionally, Pzr. level should be lowering if an overcooling were occurring. Instead, it's going up.
- B: INCORRECT: If the charging flow control valve failed open it would normally cause a rise in Pressurizer level. However, based on the given conditions, a Safety Injection has occurred and the charging line has been isolated by Phase 'A' Isolation.
- C: CORRECT: Based on RCS pressure lowering with RCS temperature stable, the basic event going on is a loss of coolant and not an overcooling. With a Pressurizer PORV open, a low pressure area exists in the top of the Pzr causing RCS water to expand into the Pzr. raising Pzr. Level. There is no Containment pressure response because the PORV discharges to the PRT.
- D: INCORRECT: a SG steamline break outside of containment would be an overcooling type of event, however RCS temperature is stable, not going down. Additionally, Pzr. level should be lowering if an overcooling were occurring. Instead, it's going up.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

Student must be able to determine the event that has occurred based on the given plant conditions.

**Exam Bank No.:** 2101

**Last used on an NRC exam:** Never

**RO Sequence Number:** 67

Given the following:

- Unit 2 has experienced a Steam Generator Tube Rupture (SGTR).
- An RCS cooldown and de-pressurization have been performed.
- The crew is evaluating if the following plant conditions exist to allow for termination of SI:
  - adequate RCS subcooling
  - adequate secondary heat sink
  - RCS pressure stable or rising
  - adequate Pressurizer level

Which one of the below correctly describes the reason for terminating SI if these plant conditions are met?

These conditions show the plant has some stability and, based on that, SI should be terminated to prevent...

- A. or limit the amount of RCS re-pressurization so as not to over-fill the ruptured Steam Generator.
- B. a possible Pressurized Thermal Shock (PTS) condition due to the HHSI pumps re-pressurizing the RCS.
- C. over-filling the Pressurizer as backflow from the ruptured SG to the RCS occurs.
- D. RWST Swapover from occurring since there will not be any water in the Containment Emergency Sumps.

**Answer:** A prevent or limit the amount of RCS re-pressurization so as not to over-fill the ruptured Steam Generator.

**Exam Bank No.:** 2101

**K/A Catalog Number:** EPE 038 EK3.09      **Tier:** 1      **Group/Category:** 1

**RO Importance:** 4.1      **10CFR Reference:** 55.41(b)(10)

Knowledge of the reasons for the following responses as they apply to the SGTR: Criteria for securing/throttling ECCS.

**STP Lesson:** LOT 504.15      **Objective Number:** 92408

Given a copy of a step from OPOP05-EO-EO30, STATE/IDENTIFY how the action is performed and the basis for the action to include the action itself, its purpose and the result.

**Reference:** LOT 504.15, OPOP05-EO-EO30, Rev. 22

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified from**

**Distractor Justification**

- A: CORRECT: the RCS cooldown and de-pressurization are designed to reduce the DP from RCS to the ruptured SG thereby reducing the leak rate. The longer SI is in service after the RCS has been de-pressurized, the higher the DP and the more the leak rate. If the ruptured SG fills, a SG safety could lift and release radioactivity to the atmosphere.
- B: INCORRECT: It's true the RCS will re-pressurize, but the concern is not PTS, but causing the RCS to ruptured SG leak rate to go up possibly over-filling the ruptured SG.
- C: INCORRECT: over-filling the Pressurizer is a concern during RCS DE-PRESSURIZATION, not the re-pressurization that will occur if SI is not secured.
- D: INCORRECT:RWST Swapover will occur at an RWST LO-LO level (75,000 gallons). It's not likely that RWST level would lower to the LO-LO level during a SGTR because required operator actions would be able to bring the plant to a cooled down and depressurized condition before reaching a LO-LO level. Additionally, makeup to the RWST could be initiated if needed.

**Question Level:** F      **Question Difficulty** 3

**Justification:**

Student must know the bases of EOP steps.



**Exam Bank No.:** 2102

**Last used on an NRC exam:** Never

**RO Sequence Number:** 68

0POP05-EO-EC21, Uncontrolled Depressurization of All Steam Generators, limits the AFW flow going to a Steam Generator (SG) to 100 gpm, or less, under certain conditions.

Which of the below correctly describes the conditions that would require AFW flow to be limited to 100 gpm, or less?

1. Cooldown rate is exceeding Tech Spec requirements.
2. SG level/s is/are near an overflow condition.
3. SG Dryout would otherwise occur.
4. Excessive RCS de-pressurization would otherwise occur.

A. 1, 3

B. 1, 2

C. 2, 4

D. 3, 4

**Answer:** A 1, 3

**Exam Bank No.:** 2102

**K/A Catalog Number:** APE 040 AK1.07      **Tier:** 1      **Group/Category:** 1

**RO Importance:** 3.4      **10CFR Reference:** 55.41(b)(10)

Knowledge of the operational implications of the following concepts as they apply to Steam Line Rupture:  
Effects of feedwater introduction on dry SG.

**STP Lesson:** LOT 504.14      **Objective Number:** 82689

Given a copy of a step from 0POP05-EO-EC21, STATE/IDENTIFY how the action is performed and the basis for the action to include the action itself, its purpose and the result.

**Reference:** LOT 504.14, 0POP05-EO-EC21, Rev. 13, WOG EC21 Background Document

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified from**

**Distractor Justification**

- A: CORRECT: 0POP05-EO-EC21 limits AFW flow to no more than 100 gpm if SG level gets too low to prevent SG dryout or if RCS cooldown rate is exceeding TS requirements.
- B: INCORRECT: AFW flow is not limited as a consideration of a SG overfill condition. Overfill during a depressurization of all SG's is not a concern.
- C: INCORRECT: neither of the items in this distracter are correct. SG overfill is not a concern because SG liquid inventory will tend to be low due to the faulted condition affecting all SG's. Excessive RCS depressurization has probably occurred early in the tranisent.
- D: INCORRECT: Excessive RCS depressurization has probably occurred early in the tranisent. The overcooling on the RCS is due more to the steam release than the AFW flow.

**Question Level:** F      **Question Difficulty** 3

**Justification:**

Student must know the reasons for limiting AFW flow in 0POP05-EO-EC21.

**Exam Bank No.:** 2103

**Last used on an NRC exam:** Never

**RO Sequence Number:** 69

Given the following:

- Unit 2 was operating at 30% power when all normal Feedwater flow was lost.
- The Reactor did NOT trip.
- The crew is performing the actions of OPOP05-EO-FRS1, Response to Nuclear Power Generation – ATWS.
- AFW Pumps 12 and 14 are in service. AFW Pumps 11 and 13 are not running or available.
- All SG levels are 8-11% NR.
- AFW flows are currently adjusted to approximately 125 gpm per Steam Generator (SG).

Which one of the following correctly describes actions required AND the reason for the action?

Adjust AFW valves to obtain a total AFW flow of at least....

- A. 576 gpm until at least ONE SG NR level exceeds 14% to establish a secondary heat sink.
- B. 576 gpm until ALL SG NR levels exceed 14% to prevent ANY SG tube dryout.
- C. 1080 gpm until at least ONE SG NR level exceeds 14% to establish a secondary heat sink.
- D. 1080 gpm until ALL SG NR levels exceed 14% to prevent ANY SG tube dryout.

**Answer:** C 1080 gpm until at least ONE SG NR level exceeds 14% to establish a secondary heat sink.

**Exam Bank No.:** 2103

**K/A Catalog Number:** APE 054 AK3.03      **Tier:** 1      **Group/Category:** 1

**RO Importance:** 3.8      **10CFR Reference:** 55.41(b)(10)

Knowledge of the reasons for the following responses as they apply to the Loss of Main Feedwater (MFW): Manual control of AFW flow control valves

**STP Lesson:** LOT 504.28      **Objective Number:** 83555

Given a step, note or caution from 0POP05-EO-FRS1, STATE its basis.

**Reference:** 0POP05-EO-FRS1, Rev. 16

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified from**

**Distractor Justification**

- A: INCORRECT: 576 gpm total AFW is the normal requirement for a secondary heat sink if no SG's are >14% NR. For an ATWS condition, the total flow requirement is 1080 gpm. It is true that only one SG has to be above 14% NR for the total flow requirement to not apply.
- B: INCORRECT: 576 gpm total AFW is the normal requirement for a secondary heat sink, not based on a concern of tube dryout.
- C: CORRECT: there must be at least 1080 gpm total AFW flow if no SG's are > 14% NR to establish a secondary heat sink.
- D: INCORRECT: 1080 gpm total AFW flow is the correct amount needed for a heat sink during an ATWS condition, not as a concern for SG tube dryout.

**Question Level:** F      **Question Difficulty** 3

**Justification:**

Student must know the heat sink requirements during an ATWS condition.

**Exam Bank No.:** 2104

**Last used on an NRC exam:** Never

**RO Sequence Number:** 70

Given the following:

- Unit 2 has experienced a Loss of All AC Power.
- The crew is performing the actions of 0POP05-EO-EC00, Loss of All AC Power.

Which one of the below correctly describes how the SG PORV's will be operated AND the reason for that method?

The SG PORV's will be ....

- A. allowed to operate in AUTOMATIC because they can respond quicker than the operator thereby preventing the SG Safety Valves from lifting as natural circulation cooling initially develops
- B. placed in MANUAL and opened no further than 50% to conserve energy in their hydraulic units. Otherwise, control of the SG PORV's, and natural circulation, would be lost from the Control Room.
- C. allowed to operate in AUTOMATIC because they can respond quicker than the operator thereby preventing a Pressurizer PORV from lifting as natural circulation cooling initially develops.
- D. placed in MANUAL and opened to 60% to establish a downward ramp on SG pressures thereby ramping down RCS temperature and pressure to minimize the potential for an RCP seal failure.

**Answer:** B placed in MANUAL and opened no further than 50% to conserve energy in their hydraulic units. Otherwise, control of the SG PORV's, and natural circulation, would be lost from the Control Room.

**Exam Bank No.:** 2104

**K/A Catalog Number:** EPE 055 EK1.02      **Tier:** 1      **Group/Category:** 1

**RO Importance:** 4.1      **10CFR Reference:** 55.41(b)(10)

Knowledge of the operational implications of the following concepts as they apply to the Station Blackout:  
Natural Circulation Cooling.

**STP Lesson:** LOT 505.01      **Objective Number:** 92110

Given a precaution, note, or step(s) and the context in which it is used from the referenced procedure, DESCRIBE its basis and any applicable limits.

**Reference:** LOT 505.01, OPOP05-EO-EC00, Rev. 21

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified from**

**Distractor Justification**

- A: INCORRECT: The SG PORV's are placed in Manual to conserve hydraulic pressure energy because their hydraulic units have lost power.
- B: CORRECT: The actuating units for the SG PORV's have lost power. There is enough stored energy in their hydraulic units for 1.5 strokes therefore their positioning is limited to conserve hydraulic pressure. Without adequate hydraulic pressure, the SG PORV's cannot be operated from the Control Room.
- C: INCORRECT: The SG PORV's are placed in Manual to conserve hydraulic pressure energy because their hydraulic units have lost power.
- D: INCORRECT: The SG PORV's are placed in Manual to conserve hydraulic pressure energy because their hydraulic units have lost power. They are limited to being open no more than 50%.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

Student must determine the operating capability of the SG PORV's based on the given plant conditions and how that dictates how the PORV's are controlled.

**Exam Bank No.:** 2086

**Last used on an NRC exam:** Never

**RO Sequence Number:** 71

Given the following:

- Unit 1 has just tripped from a full power condition due to a loss of Main Condenser Vacuum.
- All systems have operated as designed EXCEPT AFW Pump 11 has failed to start.

Which one of the below correctly describes the effect this malfunction has IF no operator action is taken AND the appropriate action for the operator to take in accordance with OPOP05-EO-EO00, Reactor Trip or Safety Injection, Addendum 5, Step 3, 'Verify AFW System status'?

If NO operator action is taken, the failure of AFW Pump 11 to start will prevent establishing a heat sink on ...

- A. ONLY SG 1A. The operator should attempt to manually start AFW Pump #11 by FIRST resetting the SG LO-LO Level actuation circuit, then using the pump control switch on panel CP-006.
- B. ALL SG's. The operator should attempt to manually start AFW Pump #11 by using the pump control switch on panel CP-006.
- C. ALL SG's. The operator should attempt to manually start AFW Pump #11 by FIRST resetting the SG LO-LO Level actuation circuit, then using the pump control switch on panel CP-006.
- D. ONLY SG 1A. The operator should attempt to manually start AFW Pump #11 by using the pump control switch on panel CP-006.

**Answer:** D ONLY SG 1A. The operator should attempt to manually start AFW Pump #11 by using the pump control switch on panel CP-006 to attempt a pump start.

**Exam Bank No.:** 2086

**K/A Catalog Number:** 061 A2.05

**Tier:** 2 **Group/Category:** 1

**RO Importance:** 3.1 **10CFR Reference:** 55.41(b)(10)

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

**STP Lesson:** LOT 504.05 **Objective Number:** 80483

Given a copy of a subsequent step or from memory an immediate action step from POP05-EO-EO00, STATE/IDENTIFY how the action is performed and the basis for the action to include the action itself, its purpose and result.

**Reference:** LOT 504.05, LOT 202.28

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: The failure of AFW # 11 to start WILL prevent a heat sink from being established on SG 1A, however, AFW system is designed such that any ONE of the AFW trains will supply the heat sink requirement for the plant following an automatic actuation on SG LO-LO level. The AFW system DID actuate on SG LO-LO level, however it's not necessary to reset this logic to start the AFW pump.
- B: INCORRECT: The minimum total flow requirement is 576 gpm. The AFW system is designed such that any ONE of the AFW trains will supply this requirement following an automatic actuation on SG LO-LO level therefore the plant heat sink requirements are met with the other AFW trains in operation. To attempt a manual start of the affected pump, the operator need only use the pump control switch, as stated. No reset of any actuation logic is required.
- C: INCORRECT: The AFW system is designed such that any ONE of the AFW trains will supply the heat sink requirements following an automatic actuation on SG LO-LO level therefore failure of one AFW pump will not prevent the heat sink requirements from being met. The AFW system DID actuate on SG LO-LO level, however it's not necessary to reset this logic to start the AFW pump.
- D: CORRECT: The AFW system is designed such that any ONE of the AFW trains will supply the heat sink requirements for the plant following an automatic actuation on SG LO-LO level. No reset of any actuation logic is required to attempt a pump start.

**Question Level:** H **Question Difficulty** 3

**Justification:**

Student must determine how the AFW system will respond based on the given conditions and know what operator action would be required.



**Exam Bank No.:** 2115

**Last used on an NRC exam:** Never

**RO Sequence Number:** 72

Given the following:

- Unit 1 is in Mode 3
- The Reactor Operator is taking logs.

Which one of the following correctly describes how an item only applicable to Mode 1 (item is not required for current plant conditions) is to be recorded?

The operator will put ...

- A. a checkmark on the item to indicate it was reviewed.
- B. "N/A" on the log for this item.
- C. a red circle around the item and record the reason in the "Comments" section of the log.
- D. an asterisk (\*) for this item and record the reason in the "Comments" section of the log.

**Answer:** B "N/A" on the log for this item.

**Exam Bank No.:** 2115

**K/A Catalog Number:** G2.1.18                      **Tier:** 3    **Group/Category:**

**RO Importance:** 3.6    **10CFR Reference:** 55.41(b)(10)

Ability to make accurate, clear, and concise logs, records, status boards, and reports.

**STP Lesson:** LOT 507.01    **Objective Number:** 92184

Given the title of an administrative procedure, IDENTIFY the actions that are performed by the control room operator.

**Reference:** OPOP01-ZQ-0022, Rev. 63

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New                      **Modified from**

**Distractor Justification**

- A: INCORRECT: ZQ-0022 specifies that checkmarks are NOT to be used to indicate acceptability.
- B: CORRECT: per ZQ-0022, paragraph 4.3.8
- C: INCORRECT: Red circle are used to indicate an out of spec reading on paper logs.
- D: INCORRECT: there is no guidance in ZQ-0022 for using asterisks to denote items that do not apply for current plant conditions.

**Question Level:** F                      **Question Difficulty** 3

**Justification:**

Student must know the log keeping requirements per OPOP01-ZQ-0022.

**Exam Bank No.:** 2112

**Last used on an NRC exam:** Never

**RO Sequence Number:** 73

Given the following:

- Unit 1 has experienced a Large Break Loss of Coolant Accident (LBLOCA).
- The crew is performing the actions of 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant.
- The Hydrogen Monitors have been placed in service.
- The Unit Supervisor requests the Reactor Operator inform him/her if Containment Hydrogen concentration reaches 0.5 %.

Which one of the below correctly describes how the Reactor Operator would know if Hydrogen Concentration is 0.5%?

The Reactor Operator will know Containment Hydrogen concentration has reached 0.5% by...

- A. observing Hydrogen concentration on the Control Board meter at CP-002.
- B. asking a Plant Operator to monitor Hydrogen Concentration locally at the Hydrogen Monitor Panel on the 60' of the EAB.
- C. the receipt of a HIGH CNTMT H2 Annunciator alarm on Control Room Panel CP-002.
- D. observing a digital display of Hydrogen concentration on a QDPS screen.

**Answer:** D observing a digital display of Hydrogen concentration on a QDPS screen.

**Exam Bank No.:** 2112

**K/A Catalog Number:** EPE 011 G2.1.19      **Tier:** 1      **Group/Category:** 1

**RO Importance:** 3.9      **10CFR Reference:** 55.41(b)(9)

Ability to use plant computers to evaluate system or component status.

**STP Lesson:** LOT 201.27      **Objective Number:** 91590

DESCRIBE the controls and indication in the control room.

**Reference:** LOT 201.27

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: INCORRECT: There are no control board meters for H2 concentration.
- B: INCORRECT: There is local indication available, but there's also indication available in the control room that's what's specified to be used in the procedure. Additionally, the H2 monitors are located on the 60' MAB, not EAB.
- C: INCORRECT: There is no Control Room alarm for high H2 concentration.
- D: CORRECT: Both H2 monitors output to the QDPS (and ICS) where a digital display is available.

**Question Level:** F      **Question Difficulty** 3

**Justification:**

Student must know where to read Containment H2 concentration.

**Exam Bank No.:** 2108

**Last used on an NRC exam:** Never

**RO Sequence Number:** 74

Which one of the following is a correct example of when the plant paging system (Public Address System) is to be used by Control Room staff in accordance with the Conduct of Operations Manual?

Use the plant paging system to ...

- A. announce changes in plant modes (e.g. changing from mode 3 to mode 4).
- B. routinely contact plant personnel that are outside the Control Room.
- C. announce Shift Manager reliefs.
- D. inform plant personnel before making ANY changes in Main Turbine load.

**Answer:** A announce changes in plant modes (e.g. changing from mode 3 to mode 4).

**Exam Bank No.:** 2108

**K/A Catalog Number:** G2.1.14

**Tier:** 3 **Group/Category:**

**RO Importance:** 3.1 **10CFR Reference:** 55.41(b)(10)

Knowledge of criteria or conditions that require plant-wide announcements, such as pump starts, reactor trips, mode changes, etc.

**STP Lesson:** LOY 507.01 **Objective Number:** 92184

Given the title of an administrative procedure, IDENTIFY the actions that are performed by the control room operator.

**Reference:** Conduct of Operations Manual, Chapter 2 (Rev.46) and Chapter 3 (Rev. 7)

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified from**

**Distractor Justification**

- A: CORRECT: per the Conduct of Ops, chapter 3, announcements of change in plant status or major events are acceptable.
- B: INCORRECT: per Conduct of Ops, chapter 3, routine announcements to contact personnel are unnecessary.
- C: INCORRECT: per Conduct of Ops, chapter 2 and 3, this example is not one cited for use of the PA system.
- D: INCORRECT: per Conduct of Ops, chapter 2 and 3, this example is not one cited for use of the PA system.

**Question Level:** F **Question Difficulty** 3

**Justification:**

Student must know the guidelines for using the PA system in the Conduct of Operations.

**Exam Bank No.:** 438

**Last used on an NRC exam:** 1997

**RO Sequence Number:** 75

Maintenance requests an Equipment Clearance Order to perform adjustment and testing of limit and torque switches for a motor operated valve (MOV).

In order to perform the required testing, the MOV:

- A. can only be operated under a Test Tag by the Operational Authority, or with permission of the Operational Authority, when requested by the Test Tag owner (Acceptor or designee).
- B. can only be operated under a Caution Tag by the Acceptor to whom the Caution Tag is issued and only after Operational Authority approval.
- C. SHALL be tagged with both a Caution Tag and a Test Tag with the Caution Tag stating that removal of the Test Tag permits operational testing.
- D. SHALL be tagged with both a Danger Tag and a Test Tag, with the Danger Tag removed prior to any MOV operation during the testing.

**Answer:** A can only be operated under a Test Tag by the Operational Authority, or with permission of the Operational Authority, when requested by the Test Tag owner (Acceptor or designee).

**Exam Bank No.:** 438

**K/A Catalog Number:** G2.2.14                      **Tier:** 3    **Group/Category:**

**RO Importance:** 3.9      **10CFR Reference:** 55.41(b)(10)

Knowledge of the process for controlling equipment configuration or status.

**STP Lesson:** LOT 507.01      **Objective Number:** T50701

Upon completion of this lesson, and without using reference material unless provided, the student will be able to implement and properly carry out any assigned duties as listed in the Plant Administrative Procedures and achieve a passing score on course examinations and quizzes on the subject.

**Reference:** OPGP03-ZO-EC01A, Rev. 19

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank                      **Modified from**

**Distractor Justification**

- A: CORRECT: A Test Tag is used when the component's position must be changed during testing or maintenance. Additionally, the operator must recognize that a Test Tag will be used and that the Operational Authority must operate the equipment.
- B: INCORRECT: A Caution Tag is inappropriate for testing.
- C: INCORRECT: Removal of a Test Tag shall not be interpreted as permission to operate any components by the operational authority.
- D: INCORRECT: Whenever a Test Tag is used a Danger Tag cannot be used for the same component.

**Question Level:** H      **Question Difficulty** 2

**Justification:**

This item tests the candidate's knowledge of the Equipment Clearance Order (ECO) process as it relates to testing of motor operated valves. As he analyzes each distractor he must apply the following concepts: which tags are used, which tags may not be used, which tags are not compatible with each other, and the responsibilities of the operational authority.



**Exam Bank No.:** 2134

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 76

Given the following:

- Unit 1 is at 100% power.
- Train 'A' ECW is inoperable to allow for maintenance.
- During maintenance on Train 'A' ECW, an unexpected condition arose and the craft wants to troubleshoot the component, however troubleshooting the component will render it inoperable.

In accordance with OPOP01-ZO-0012, Operations Troubleshooting Process, troubleshooting activities on this component \_\_\_\_\_ allowed. Troubleshooting plans are approved by the \_\_\_\_\_ Manager.

- A. ARE, Shift
- B. are NOT, Shift
- C. are NOT, Plant
- D. Are, Plant

**Answer:** A ARE, Shift

**Exam Bank No.:** 2134

**K/A Catalog Number:** G2.2.20

**Tier:** 3 **Group/Category:** 2

**SRO Importance:** 3.8 **10CFR Reference or SRO Objective:** 55.43(b)(3)

Knowledge of process for managing troubleshooting activities.

**STP Lesson:** LOT 507.01 **Objective Number:** 92186

Given the title of an administrative procedure, DISCUSS the requirements associated with the referenced procedure.

**Reference:** OPOP01-ZO-0012, Rev. 1

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified From**

**Distractor Justification**

- A: CORRECT: activities are allowed since the system has already been declared inoperable. The Shift Manager is the correct approval authority.
- B: INCORRECT: activities are allowed since the system has already been declared inoperable. The Shift Manager is the correct approval authority.
- C: INCORRECT: activities are allowed since the system has already been declared inoperable. The Plant Manager is NOT the correct approval authority.
- D: INCORRECT: activities are allowed since the system has already been declared inoperable. The Plant Manager is NOT the correct approval authority.

**Question Level:** F **Question Difficulty** 3

**Justification:**

The student must have knowledge of the Operations troubleshooting process.

**Exam Bank No.:** 1772

**Last used on an NRC exam:** 2009

**SRO Sequence Number:** 77

Given the following conditions:

- Unit 2 is at 100% power.
- A Site Area Emergency (SAE) has been declared due to high radioactivity levels on RT-8010B, Unit Vent Stack Rad Monitor, caused by an ongoing water leak in the MAB.
- The on-duty Shift Manager is the Emergency Director.

In accordance with PGP03-ZA-0090, Work Process Program, which one of the following correctly describes a method that could be implemented to expeditiously repair the leak and stop the release?

Maintenance can be directed to begin work without an approved work package after the...

- A. Shift Manager declares the repair Emergent Work.
- B. Shift Manager declares the repair Emergency Maintenance.
- C. Plant Manager declares the repair Emergent Work.
- D. Plant Manager declares the repair Emergency Maintenance.

**Answer:** B The Shift Manager declares the repair Emergency Maintenance.

**Exam Bank No.:** 1772

**K/A Catalog Number:** G2.2.19

**Tier:** 3 **Group/Category:** 2

**SRO Importance:** 3.4 **10CFR Reference or SRO Objective:** 55.43(b)(4)

Knowledge of Maintenance Work Order requirements.

**STP Lesson:** LOT 802.33 **Objective Number:** SRO-50014

DESCRIBE the Work Process Priority classifications for condition reports.

**Reference:** PGP03-ZA-0090, Rev. 37, Step 2.6

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank

**Modified From**

**Distractor Justification**

- A: INCORRECT: Emergent work requires a work package.
- B: CORRECT: In accordance with OPGP03-ZA-0090.
- C: INCORRECT: Only the Shift Manager/Emergency Director has the authority to declare emergency maintenance. Additionally, Emergent work requires a work package.
- D: INCORRECT: Only the Shift Manager/Emergency Director has the authority to declare emergency maintenance.

**Question Level:** F **Question Difficulty** 3

**Justification:**

The candidate must have a knowledge of the requirements for emergency maintenance under the work process program.

**Exam Bank No.:** 1643

**Last used on an NRC exam:** 2007

**SRO Sequence Number:** 78

Following a LOCA, the crew is performing the actions of POP05-EO-EO10, Loss of Reactor or Secondary Coolant, when the following conditions were noted:

- RCS pressure is 600 psig.
- Core exit thermocouples (CETs) are reading 710°F.
- Pressurizer level is off scale low.
- RVWL Plenum level indicates 0%.

Based on these conditions, the Unit Supervisor should transition to:

- A. 0POP05-EO-FRC1, Response to Inadequate Core Cooling, because core uncover is likely occurring.
- B. 0POP05-EO-FRC2, Response to Degraded Core Cooling, because core uncover is likely occurring.
- C. 0POP05-EO-FRC1, Response to Inadequate Core Cooling, because core damage is occurring.
- D. 0POP05-EO-FRC2, Response to Degraded Core Cooling, because core damage is occurring.

**Answer:** B 0POP05-EO-FRC2, Response to Degraded Core Cooling, because core uncover is likely occurring.

**Exam Bank No.:** 1643

**K/A Catalog Number:** 017 A2.02

**Tier:** 2 **Group/Category:** 2

**SRO Importance:** 4.1 **10CFR Reference or SRO Objective:** 55.43(b)(5)

Ability to (a) predict the impacts of the following malfunctions or operations on the ITM System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Core damage

**STP Lesson:** LOT 504.31 **Objective Number:** 92194

STATE the condition(s) under which 0POP05-EO-FRC2 is entered.

**Reference:** 0POP05-EO-FO02, Rev. 2

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank

**Modified From**

**Distractor Justification**

- A: INCORRECT - Entry criteria for FRC1 is 1200 degrees. With the given conditions, core uncover is likely but fuel damage should not be occurring yet.
- B: CORRECT - Entry criteria for FRC2 are met. With the given conditions, core uncover is likely but core damage should not be occurring yet.
- C: INCORRECT - Entry criteria for FRC1 is 1200 degrees, core damage should not be occurring yet.
- D: INCORRECT - Transitioning to FRC2 is correct, but core damage should not be occurring yet.

**Question Level:** H **Question Difficulty** 3

**Justification:**

The applicant must use the given conditions and a knowledge of the Core Cooling critical safety function status tree to determine which entry criteria is met. A knowledge of accident analysis is needed to determine if the given conditions will result in core uncover or fuel damage.

**Exam Bank No.:** 2123

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 79

A Unit 2 power reduction was in progress to allow operators to isolate a leak on the LOWER sensing line of Pressurizer level transmitter LT-0467. The affected channel has been de-selected from control.

During the power reduction, a secondary transient caused a Pressurizer PORV to open and it stuck partially open. The affected PORV Block Valve could not be closed so a manual Reactor Trip and Safety Injection actuation were performed.

Given the following:

- The Control Room crew is currently performing 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant, Step 15, CHECK if SI flow should be terminated.
- RCB Pressure is 0.5 psig.
- RCS Subcooling is 45°F.
- All SG Narrow Range (NR) Levels are 50% and stable.
- RCS Pressure is 1505 psig and stable.

Based on the given conditions:

- LT-0467 is reading (1).
- Actual PZR level is (2) .
- The Unit Supervisor would (3).

	(1)	(2)	(3)
A	higher than actual level.	off scale high.	transition to 0POP05-EO-ES11, SI Termination.
B	lower than actual level.	off scale low.	transition to 0POP05-EO-ES11, SI Termination.
C	higher than actual level.	off scale low.	stay in 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant
D	lower than actual level.	off scale high.	stay in 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant

**Answer:** D lower than actual level - off scale high - stay in 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant.

**Exam Bank No.:** 2123

**K/A Catalog Number:** APE 008 AA2.27      **Tier:** 1      **Group/Category:** 1

**SRO Importance:** 3.2      **10CFR Reference or SRO Objective:** 55.43(b)(5)

Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident:  
Affects on indicated PZR pressure and/or level of sensing line leakage.

**STP Lesson:** LOT 501.21      **Objective Number:** 501215

Given a set of conditions or event description, be able to PREDICT the sequence of events and trends of plant parameters for a transient or accident involving a decrease in Reactor Coolant Inventory.

**Reference:** 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant.

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified From**

**Distractor Justification**

- A: INCORRECT: See Justification on Answer D.
- B: INCORRECT: See Justification on Answer D.
- C: INCORRECT: See Justification on Answer D.
- D: CORRECT: LT-0467 will indicate lower than actual level because of the lower sensing line leak. Actual level will be off scale high due to the open PZR PORV causing a PZR Vapor Space SBLOCA. PZR level being off scale high would support a transition to 0POP05-ES-EO11, SI Termination, but RCS pressure is too low. RCS pressure would have to be > 1745 psig.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

The student must apply fundamental knowledge to determine the indicated and actual Pressurizer level responses. Additionally, he/she must be able to use the given information to determine which procedure to implement.



**Exam Bank No.:** 2124

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 80

Unit 1 Reactor Power is 30% and being raised at 10%/hour.

Subsequently a Reactor Operator reports the following:

- RCP 1B Stator Winding Temperature is 304°F.
- RCP 1D Stator Winding Temperature is 314°F.

Assuming the reported conditions are valid, the Unit Supervisor should enter...

- A. 0POP04-RC-0002, Reactor Coolant Pump Off Normal; trip the Reactor and Main Turbine, then stop ONLY RCP 1D, then perform 0POP05-EO-EO00, Reactor Trip or Safety Injection.
- B. 0POP04-RC-0002, Reactor Coolant Pump Off Normal; trip the Reactor and Main Turbine, then stop RCP's 1B AND 1D, then perform 0POP05-EO-EO00, Reactor Trip or Safety Injection.
- C. 0POP04-TM-0003, Turbine Trip Below P-9; trip the Main Turbine, then stop ONLY RCP 1D, then stabilize Reactor Power at 12-15% power using Steam Dumps.
- D. 0POP04-TM-0003, Turbine Trip Below P-9; trip the Main Turbine, then stop RCP's 1B AND 1D, then stabilize Reactor Power at 12-15% power using Steam Dumps.

**Answer:** A 0POP04-RC-0002, Reactor Coolant Pump Off Normal; trip the Reactor and Main Turbine, then stop ONLY RCP 1D, then perform 0POP05-EO-EO00, Reactor Trip or Safety Injection.

**Exam Bank No.:** 2124

**K/A Catalog Number:** APE 15/17 AA2.09      **Tier:** 1      **Group/Category:** 1

**SRO Importance:** 3.5      **10CFR Reference or SRO Objective:** 55.43(b)(5)

Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunctions:  
When to secure RCPs on high stator temperatures.

**STP Lesson:** LOT 505.01      **Objective Number:** 92108

Given a plant condition, STATE the actions required to be performed per the applicable Off-Normal procedure.

**Reference:** OPOP04-RC-0002, Rev. 29

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified From**

**Distractor Justification**

- A: CORRECT: RCP trip criteria for Stator winding temperature is 310 degrees F or more so only RCP 1D needs to be secured, however the reactor must first be tripped.
- B: INCORRECT: RCP trip criteria for Stator winding temperature is 310 degrees F or more so only RCP 1D needs to be secured.
- C: INCORRECT: This is a viable distractor since the reactor will not automatically trip with power below P-8 (40%) when securing a RCP. Additionally, a turbine trip will not cause a reactor trip because reactor power is also below P-9 (50%).
- D: INCORRECT: This is a viable distractor since the reactor will not automatically trip with power below P-8 (40%) when securing a RCP. Only RCP 1D needs to be secured.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

Based on given conditions the student has to determine the correct procedure to enter and the actions to take.

**Exam Bank No.:** 2125

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 81

The following plant conditions exist in Unit 1:

- The Control Room Staff is responding to an RCS LOCA.
- OPOP05-EO-FRC2, Response to Degraded Core Cooling, is being performed.

The Unit Supervisor should transition to.....

- A. OPOP05-EO-FRS2, Response to Loss of Core Shutdown, if the critical safety function status tree for the Subcriticality path turns YELLOW.
- B. OPOP05-EO-FRZ1, Response to High Containment Pressure, if the critical safety function status tree for the Containment path turns ORANGE.
- C. OPOP05-EO-FRP1, Response to Imminent Pressurized Thermal Shock Condition, if the critical safety function status tree for the Integrity path turns ORANGE.
- D. OPOP05-EO-FRH1, Response to Loss of Secondary Heat Sink, if the critical safety function status tree for the Heat Sink path turns RED.

**Answer:** D OPOP05-EO-FRH1, Response to Loss of Secondary Heat Sink, if the critical safety function status tree for the Heat Sink path turns RED.

**Exam Bank No.:** 2125

**K/A Catalog Number:** EPE 011 G2.4.5      **Tier:** 1      **Group/Category:** 1

**SRO Importance:** 4.3      **10CFR Reference or SRO Objective:** 55.43(b)(5)

Large Break LOCA: Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions.

**STP Lesson:** LOT 504.04      **Objective Number:** 92245

LIST/IDENTIFY the four (4) levels of action (color) in the Critical Safety Function Status Trees and the meaning of each.

**Reference:** OPOP01-ZA-0018, EOP Users Guide, Rev 19

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank      **Modified From**

**Distractor Justification**

- A: INCORRECT: The YELLOW path on subcriticality is of a lower priority than the ORANGE path on core cooling.
- B: INCORRECT: The ORANGE path on containment is of a lower priority than the ORANGE path on core cooling.
- C: INCORRECT: The ORANGE path on integrity is of a lower priority than the ORANGE path on core cooling.
- D: CORRECT: FRC2 is only entered with a Core Cooling orange path. The RED path on heat sink is of a higher priority than the ORANGE path on core cooling.

**Question Level:** F      **Question Difficulty** 3

**Justification:**

Applicant must understand that FRC2 is only entered with an orange path and have knowledge of the six Critical Safety Functions monitored by the EOPs in order of priority and the four levels of action (color) in the Critical Safety Function Status Trees and the meaning of each.

**Exam Bank No.:** 2128

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 82

Given the following:

- A Large Break LOCA has occurred on Unit 2.
- The operating crew has entered 0POP05-EO-FRC1, Response to Inadequate Core Cooling.
- Core Exit Thermocouples are 1210 °F and rising.
- RWST level is at 50,000 gallons and stable.

Safety Injection (SI) and Charging Pump status are as follows:

- Charging Pump 2A and Train 'C' HHSI/LHSI Pumps were out of service prior to the event.
- Charging Pump 2B and the PDP are secured.
- Train 'A' and 'B' HHSI Pumps indicate full flow.
- Train 'A' and 'B' LHSI Pumps indicate full flow.

0POP05-EO-FRC1 Step 2 states:

VERIFY SI Flow In ALL 3 trains:

- HHSI pump flow – INDICATED
- LHSI pump flow – INDICATED

Based on the given information, which one of the below correctly describes what the Unit Supervisor should do next?

- A. Per the 0POP05-EO-FRC1 Conditional Information Page, immediately transition to 0POP05-EO-EC11, Loss of Emergency Coolant Recirculation.
- B. Step 2 is satisfied, continue to Step 3 of 0POP05-EO-FRC1.
- C. Per the 0POP05-EO-FRC1 Conditional Information Page, immediately transition to the Severe Accident Management Guidelines (SAMG's).
- D. Step 2 is NOT satisfied, go to Step 2 Response Not Obtained (RNO) Column of 0POP05-EO-FRC1.

**Answer:** D Step 2 is NOT satisfied, go to Step 2 Response Not Obtained (RNO) Column of 0POP05-EO-FRC1..

**Exam Bank No.:** 2128

**K/A Catalog Number:** W/E06 G2.1.7      **Tier:** 1      **Group/Category:** 2

**SRO Importance:** 4.7      **10CFR Reference or SRO Objective:** 55.43(b)(5)

Degraded Core Cooling: Ability to evaluate and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

**STP Lesson:** LOT 504.30      **Objective Number:** 82891

Given a step, note, or caution from POP05-EO-FRC1, STATE its basis.

**Reference:** 0POP05-EO-FRC1, Response to Inadequate Core Cooling, Rev. 14

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified From**

**Distractor Justification**

- A: INCORRECT: A transition to 0POP05-EO-EC11 is not listed on the 0POP05-EO-FRC1 CIP. Additionally, a transition would not be made unless ALL trains of ECCS could not be aligned for recirculation. The RWST level at 50000 gallons and stable indicates Auto swapover for at least Trains B & C has successfully occurred.
- B: INCORRECT: As per information in justification for Answer D, all 3 trains must have ECCS flow indicated.
- C: INCORRECT: SAMGs would not be entered until after step 20 of 0POP05-EO-FRC1 per the CIP.
- D: CORRECT: This is based on a recent change to 0POP05-EO-FRC1 due to STP operating experience. All 3 trains of ECCS must have flow indicated even if 1 train was previously OOS.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

The student must evaluate the given conditions to determine which procedural action to take.

**Exam Bank No.:** 2129

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 83

Given the following:

- Unit 1 is at 100% Power with all systems in a normal lineup.

Subsequently the following occurs:

- The MSIV on SG 1B inadvertently closes causing a Reactor trip.
- The Control Room crew has completed the immediate actions of 0POP05-EO-EO00, Reactor Trip or Safety Injection.
- SG 1B pressure rose to 1260 psig during the event, but SG 1B PORV did NOT open in Automatic.
- Attempts to open SG 1B PORV using Manual Control did NOT succeed.
- All other indications are normal for the Reactor trip.

Based on the given conditions which one of the following actions will the Unit Supervisor perform AND how is plant operation affected by the inoperable SG PORV?

The Unit Supervisor will transition to...

- A. 0POP05-EO-FRH2, Response to Steam Generator Overpressure. Subsequent operation in MODE 1 is allowed provided the Power Range High Flux Trip Setpoint is reduced to 61%.
- B. 0POP05-EO-FRH2, Response to Steam Generator Overpressure. Operation in MODE 3 is allowed for up to 7 days before compliance with a Tech Spec Action is required.
- C. 0POP05-EO-ES01, Reactor Trip Response. Subsequent operation in MODE 1 is allowed provided the Power Range High Flux Trip Setpoint is reduced to 61%.
- D. 0POP05-EO-ES01, Reactor Trip Response. Operation in MODE 3 is allowed for up to 7 days before compliance with a Tech Spec Action is required.

**Answer:** D 0POP05-EO-ES01, Reactor Trip Response. Operation in MODE 3 is allowed for up to 7 days before compliance with a Tech Spec Action is required.

**Exam Bank No.:** 2129

**K/A Catalog Number:** W/E13 EA2.2                      **Tier:** 1    **Group/Category:** 2

**SRO Importance:** 3.4    **10CFR Reference or SRO Objective:** 55.43(b)(5)

Ability to determine and interpret the following as they apply to the Steam Generator Overpressure:  
Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

**STP Lesson:** LOT 504.34            **Objective Number:** 92223

STATE/IDENTIFY the conditions under which 0POP05-EO-FRH2 is entered.

**Reference:** 0POP05-EO-FRH2, Rev. 8, and TS 3.7.1.6

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New                      **Modified From**

**Distractor Justification**

- A: INCORRECT: 0POP05-EO-FRH2 is not entered unless SG pressure is greater than 1325 psig. Additionally, the requirement for reducing the Power Range High Flux Setpoint is associated with an inoperable SG Safety Valve, not SG PORV.
- B: INCORRECT: 0POP05-EO-FRH2 is not entered unless SG pressure is greater than 1325 psig. The TS action statement is correct. After 7 days, a CRMP must be performed or a mode change made.
- C: INCORRECT: The procedure selection is correct, but the TS action is not. The requirement for reducing the Power Range High Flux Setpoint is associated with an inoperable SG Safety Valve, not SG PORV.
- D: CORRECT: Transition to 0POP05-EO-ES01 would be correct. The SG PORV can be inoperable for 7 days in MODE 3 before compliance with a TS action is required (a CRMP must be performed or a mode change made).

**Question Level:** H            **Question Difficulty** 3

**Justification:**

The student has to evaluate the given conditions and determine which procedure transition applies. Additionally, he/she must know the Tech Spec provisions for an inoperable SG PORV.



**Exam Bank No.:** 2132

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 84

Given the following:

- Unit 1 is at 13% power and performing 0POP03-ZG-0005, Plant Start-up to 100%.
- The operations crew is preparing to close the Main Generator Output Breaker.
- Due to an electrical issue with Unit 1 and Unit 2 13.8 KV Standby Transformers, ALL Unit 1 13.8 KV Auxiliary Buses are being powered from the Unit 1 AUX Transformer.
- When the Main Generator is paralleled to the Grid (output breaker closed), the Synchroscope is moving SLOW in the FAST direction and is at the 04:00 position.

Immediately, the following occurs:

- The Main Generator Output Breaker re-opens.
- A Lock Out relay is actuated on the 13.8 KV Unit 1 Auxiliary Transformer.

Which one of the below correctly describes the condition that caused the Main Generator output breaker to re-open AND the appropriate procedure for the Unit Supervisor to implement?

The Main Generator Output Breaker immediately re-opened because of \_\_\_\_\_ (1) \_\_\_\_\_ the Main Generator.

Based on these conditions the Unit Supervisor would implement \_\_\_\_\_ (2) \_\_\_\_\_ to mitigate the consequences of the event.

	(1)	(2)
A.	motoring of	0POP04-AE-0001, First Response to Loss of Any or All 13.8 KV or 4.16 KV Bus,
B.	over-current on	0POP04-AE-0001, First Response to Loss of Any or All 13.8 KV or 4.16 KV Bus,
C.	over-current on	0POP05-EO-EO00, Reactor Trip or Safety Injection,
D.	motoring of	0POP05-EO-EO00, Reactor Trip or Safety Injection,

**Answer:** C over-current on - 0POP05-EO-EO00, Reactor Trip or Safety Injection,

**Exam Bank No.:** 2132

**K/A Catalog Number:** 062 A2.15

**Tier:** 2 **Group/Category:** 1

**SRO Importance:** 3.2 **10CFR Reference or SRO Objective:** 55.43(b)(5)

Ability to (a) predict the impacts of the following malfunctions or operations on the A.C. Distribution System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Consequence of paralleling out-of-phase/mismatch in volts.

**STP Lesson:** LOT 202.17 **Objective Number:** 91615

GIVEN a plant or system condition. Predict the operations of the Main Generator and Exciter System.

**Reference:** LOT 202.17

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified From**

**Distractor Justification**

- A: INCORRECT: A motoring condition will not be present because the generator speed/frequency is slightly higher than the grid frequency and would result in the generator supplying some grid load if the output breaker were to remain closed. A lockout relay condition on the U1 Aux Transformer will result in an automatic Reactor trip due to the loss of all RCP's, therefore the Unit Supervisor should enter 0POP05-EO-EO00. 0POP04-AE-0001 would only be performed after the immediate actions of 0POP05-EO-EO00 and then concurrently with EO00 and only if resources were available and actions do not interfere with the performance of the EOP's.
- B: INCORRECT: The generator output breaker will trip on over-current as stated, but the US should enter 0POP05-EO-EO00 first, not 0POP04-AE-0001. 0POP04-AE-0001 would only be performed after the immediate actions of 0POP05-EO-EO00 and then concurrently with EO00 and only if resources were available and actions do not interfere with the performance of the EOP's.
- C: CORRECT: If the Main Generator is paralleled to the grid with the sync scope moving slow in the fast direction, but at the 04:00 position, the generator voltage will be significantly out of phase with the grid. This phase difference will create a large voltage difference between the generator and grid and result in an instantaneous over-current condition between the Main Generator and grid causing the generator output breaker to trip on over-current. A motoring condition will not be present because the generator speed/frequency is slightly higher than the grid frequency and would result in the generator supplying some grid load if the output breaker were to remain closed. A lockout relay condition on the U1 Aux Transformer will result in an automatic Reactor trip due to the loss of all RCP's, therefore the Unit Supervisor should enter 0POP05-EO-EO00.
- D: INCORRECT: A motoring condition will not be present because the generator speed/frequency is slightly higher than the grid frequency and would result in the generator supplying some grid load if the output breaker were to remain closed. The Unit Supervisor should enter 0POP05-EO-EO00, as stated.

**Question Level:** H **Question Difficulty** 3

**Justification:**

The student has to evaluate the given conditions to predict the impacts and determine the correct procedure to enter.

**Exam Bank No.:** 2137

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 85

Unit 2 is shutting down and cooling down to Mode 5 for a forced outage.

Currently the following conditions exist:

- RCS Temperature: 445°F and stable.
- RCS Pressure: 910 psig and stable.
- SI Accumulators have just been isolated.
- SG Pressures: approximately 385 psig and stable.
- SG NR Levels: maintaining 55% to 75%.
- All other plant parameters are normal for the current plant condition.

Over the next minute the Control Room operators observe the following:

- RCS Temperature: 440°F and lowering.
- RCS Pressure: 450 psig and lowering.
- Containment Pressure: 0.6 psig and rising.
- Containment Radiation: Area Radiation Monitors have rising trends.
- SG Pressures: approximately 365 psig and lowering.
- SG NR Levels: maintaining 55% to 75%.

Which one of the following procedures would the Unit Supervisor use to stabilize the unit?

- A. OPOP04-RC-0006, Shutdown LOCA.
- B. OPOP05-EO-EO00, Reactor Trip or Safety Injection.
- C. OPOP05-EO-EO20, Faulted Steam Generator Isolation.
- D. OPOP04-MS-0001, Excessive Steam Demand.

**Answer:** A OPOP04-RC-0006 Shutdown LOCA

**Exam Bank No.:** 2137

**K/A Catalog Number:** G2.4.9

**Tier:** 3 **Group/Category:** 4

**SRO Importance:** 4.2 **10CFR Reference or SRO Objective:** 55.43(b)(5)

Knowledge of low power/shutdown implications in accident (e.g. LOCA or loss of RHR) mitigation strategies.

**STP Lesson:** LOT 505.01 **Objective Number:** 92106

Given plant conditions/symptoms, EVALUATE the conditions/symptoms and STATE whether or not the referenced procedure is to be used.

**Reference:** OPOP04-RC-0006, Rev. 16

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified From**

**Distractor Justification**

- A: CORRECT: The indications are indicative of an RCS leak in the RCB and OPOP04-RC-0006 would be entered for this MODE.
- B: INCORRECT: OPOP05-EO-EO00 would not be entered with RCS pressure below 1000 psig (this would be the correct answer if RCS pressure was 90 psig higher)
- C: INCORRECT: The condition listed is not indicative of a steam leak because RCB Area Rad Monitor trends are rising and SG pressures are following the RCS Tave trend. Also, OPOP05-EO-EO20 is only entered from other EOPs and no other EOPs apply with RCS pressure below 1000 psig.
- D: INCORRECT: The condition listed is not indicative of a steam leak because RCB Area Rad Monitor trends are rising and SG pressures are following the RCS Tave trend.

**Question Level:** H **Question Difficulty** 3

**Justification:**

The student must evaluate the given information and to determine the correct procedure to enter.

**Exam Bank No.:** 2140

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 86

Given the following:

- Unit 2 is at 100% power with all systems in a normal lineup.
- Current RCS Boron concentration is 550 ppm.
- Cycle Burnup is 14000 MWD/MTU.
- It has just been determined that 2 Shutdown Bank Control Rods are mechanically bound (untrippable).

Prior to beginning a Unit Shutdown the following occurs:

- Main Feedwater Reg Valve on SG 2B fails closed.
- Both Reactor Trip switches fail to make control rods drop into the core.
- The Control Room crew places Feeder Breaker Handswitches for 480V Load Centers 2K1 and 2L1 to “OPEN” and then back to “NORMAL.”
- Feeder Breaker indication for 480V Load Center 2K1 shows a red light lit.
- Feeder Breaker indication for 480V Load Center 2L1 shows a green light lit.

Based on the given conditions, in which of the following procedures would the Unit Supervisor FIRST direct that an Emergency Boration be performed AND what would be the correct amount of Emergency Boration to perform?

	FIRST procedure the US should direct an Emergency Boration be performed.	Borate RCS...
A	0POP05-EO-FRS1, Response to Nuclear Power Generation - ATWS.	to 701 ppm
B	0POP05-EO-ES01, Reactor Trip Response.	with 1880 gallons of boric acid
C	0POP05-EO-FRS1, Response to Nuclear Power Generation - ATWS.	to 1303 ppm
D	0POP05-EO-ES01, Reactor Trip Response.	with 7200 gallons of boric acid

**Answer:** C 0POP05-EO-FRS1, Response to Nuclear Power Generation - ATWS.; to 1303 ppm

**Exam Bank No.:** 2140**K/A Catalog Number:** EPE 029 G2.1.25      **Tier:** 1      **Group/Category:** 1**SRO Importance:** 4.2      **10CFR Reference or SRO Objective:** 55.43(b)(5)

Anticipated Transient Without Scram (ATWS): Ability to interpret reference materials, such as graphs, curves, tables, etc.

**STP Lesson:** LOT 502.04      **Objective Number:** 50361

Prioritize the operator-initiated recovery techniques that would mitigate the consequences of the ATWS.

**Reference:** 0POP05-EO-FRS1, Response to Nuclear Power Generation - ATWS, Rev. 16**Attached Reference**  **Attachment:** 0POP05-EO-ES01 Page 5 of 23. 0POP05-EO-FRS1 Page 5-10 of 24. Unit 2 Cycle 15 Plant Curve Book Figure 5.5.**NRC Reference Req'd**  **Attachment:****Source:** New**Modified From****Distractor Justification**

- A: INCORRECT: This ppm is from the Plant Curve Book Figure 5.5, 567 degree F. curve, not the 68 degree F curve as required.
- B: INCORRECT: 0POP05-EO-ES01 is not the correct procedure to use because the given conditions indicate an ATWS event.. The amount of borated water to add is also incorrect for the associated procedure because it's based on 2 stuck rods below a position of 18 steps. The question stem indicates there are 2 stuck rods at a position greater than 18 steps.
- C: CORRECT: The conditions given are indicative of the reactor failing to trip from the Control Room which requires entry into 0POP05-EO-FRS1. The procedure will have the US emergency borate to Plant Curve Book Figure 5.5, 68 degree F. curve which requires a boron concentration of 1303 ppm for the given cycle burnup.
- D: INCORRECT: 0POP05-EO-ES01 is not the correct procedure to use because the given conditions indicate an ATWS event has occurred. The amount of borated water to add would be correct for the associated procedure for 2 stuck rods at a position greater than 18 steps as provided in the question stem.

**Question Level:** H      **Question Difficulty** 3**Justification:**

The student must evaluate the given condition to determine the correct procedure, then use procedural guidance to determine emergency boration requirements.

**Exam Bank No.:** 2141

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 87

Given the following:

- Unit 2 is operating at full power with all systems in a normal lineup.
- A loss of the North AND South 345 KV Buses occurs.
- All plant systems operate as designed except NO ESF Diesel Generators (DG's) start.
- ALL non-class DG's DO START and operate as designed.

Which one of the below correctly describes the appropriate procedure for the Unit Supervisor to enter AND some of the immediate actions he/she would expect the Control Room Operators to perform based on the given plant conditions?

	Enter Procedure	Some of the expected Immediate Actions
A	OPOP05-EO-EC00, Loss of All AC Power	1) Manually trip the Reactor using both reactor trip switches. 2) Verify the Turbine is tripped.
B	OPOP05-EO-EO00, Reactor Trip or Safety Injection	1) Manually trip the Reactor using both reactor trip switches. 2) Manually trip the Turbine
C	OPOP05-EO-EC00 Loss of All AC Power	1) Verify Reactor trip and Bypass breakers are open. 2) Verify the Turbine is tripped.
D	OPOP05-EO-EO00, Reactor Trip or Safety Injection	1) Verify Reactor trip and Bypass breakers are open. 2) Manually trip the Turbine.

**Answer:** C OPOP05-EO-EC00 Loss of All AC Power; 1) Verify Reactor trip and Bypass breakers are open.; 2) Verify the Turbine is tripped.

**Exam Bank No.:** 2141

**K/A Catalog Number:** APE 056 G2.4.1      **Tier:** 1      **Group/Category:** 1

**SRO Importance:** 4.8      **10CFR Reference or SRO Objective:** 55.43(b)(5)

Loss of Offsite Power: Knowledge of EOP entry conditions and immediate action steps.

**STP Lesson:** LOT 504.22      **Objective Number:** 82074

STATE/IDENTIFY the two (2) entry conditions of POP05-EO-EC00 and any available control room indicators needed to make the determination.

**Reference:** 0POP05-EO-EC00, Rev. 21

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified From**

**Distractor Justification**

- A: INCORRECT: The procedure to be entered is correct, however the action of manually tripping the reactor using both reactor trip switches is not expected. An automatic reactor trip should occur when offsite power is lost. The action of verifying the turbine is tripped is expected.
- B: INCORRECT: 0POP05-EO-EO00 could be entered before EC00, but the expected immediate actions are both incorrect.
- C: CORRECT: The given conditions indicate a Loss of All AC Power has occurred even though the Emergency Transformer may still be energized and the non-class DG's are running and supplying power to their buses. The specified immediate actions would be expected for the given conditions.
- D: INCORRECT: 0POP05-EO-EO00 could be entered before EC00, but the immediate action of manually tripping the turbine would NOT be expected for the given conditions.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

The student must evaluate the given condition and determine the correct procedure and immediate actions.



**Exam Bank No.:** 2127

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 88

Given the following:

- Unit 1 is at 100% power with all systems in a normal lineup.
- An ALERT Alarm has come in on the RM-11 Computer for RT-8039, CVCS Failed Fuel Monitor.
- Chemistry has confirmed the activity being sensed by RT-8039.
- Activity sensed by RT-8039 is slowly rising.

Based on these conditions, which one of the following correctly describes the sampling location of RT-8039 and the actions the Unit Supervisor would implement?

RT-8039 samples IMMEDIATELY downstream of \_\_\_\_ (1) \_\_\_\_ . The Unit Supervisor should enter \_\_\_\_ (2) \_\_\_\_ which requires Letdown flow to be \_\_\_\_ (3) \_\_\_\_.

	(1)	(2)	(3)
A	PRESS CONT PCV-0135	0PGP04-ZE-0004, Fuel Integrity Program	Raised
B	Letdown Demineralizers	0POP04-RC-0001, High RCS Activity	Lowered
C	PRESS CONT PCV-0135	0POP04-RC-0001, High RCS Activity	Raised
D	Letdown Demineralizers	0PGP04-ZE-0004, Fuel Integrity Program	Lowered

**Answer:** C PRESS CONT PCV-0135; 0POP04-RC-0001, High RCS Activity; Raised

**Exam Bank No.:** 2127

**K/A Catalog Number:** APE 076 AA2.01      **Tier:** 1      **Group/Category:** 2

**SRO Importance:** 3.2      **10CFR Reference or SRO Objective:** 55.43(b)(5)

Ability to determine and interpret the following as they apply to the High Reactor Coolant Activity: Location or process point that is causing an alarm.

**STP Lesson:** LOT 202.41      **Objective Number:** 11504

LIST the interfaces between the Radiation Monitoring System and other systems.

**Reference:** 0POP04-RC-0001, High RCS Activity, Rev. 9

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified From**

**Distractor Justification**

- A: INCORRECT: 0PGP04-ZE-0004 is used during high RCS activity but does not give direction to raise letdown flow.
- B: INCORRECT: RT-8039 samples before the CVCS demineralizers. Additionally, 0POP04-RC-0001 calls for raising LD flow, not lowering it.
- C: CORRECT: With the listed reading on RT-8039, per 0POP04-RC-0001, Chemistry would have operations raise letdown flow. RT-8039 samples before the demineralizers to get an accurate sample of RCS activity before being influenced by the CVCS demineralizers.
- D: INCORRECT: 0PGP04-ZE-0004 is used during high RCS activity but does not give direction to change letdown flow. Additionally, RT-8039 samples before the CVCS demineralizers.

**Question Level:** F      **Question Difficulty** 3

**Justification:**

Student must know the sampling location of RT-8039, the procedure to implement and whether to raise or lower LD flow.

**Exam Bank No.:** 2130

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 89

Given the following plant conditions:

- Unit 2 is at 50% power.
- Tave is 581.5°F.
- Tref is 579.5°F.
- Control rods are in AUTO with Control Bank 'D' at 175 steps, slowly stepping in.

Which one of the following is the reason for the rod insertion AND the appropriate procedure for the Unit Supervisor to implement?

- A The RC M/U CONT switch is in DILUTE position and the red SYS ON light is NOT lit. Enter 0POP02-CV-0004, Chemical and Volume Control Subsystem, to re-align the Reactor Makeup System.
- B A Cation Demineralizer was placed in service with a LOWER boron concentration than the RCS. Enter 0POP02-CV-0004, Chemical and Volume Control Subsystem, to remove the Cation Demineralizer from service.
- C The RC M/U CONT switch is in AUTO, VCT level is at 50%, and RMW FLOW CONT Valve, FCV-111A, switch is in AUTO with red light only lit. Enter 0POP04-RC-0008, Boron Dilution Event, to re-align the Reactor Makeup System.
- D A Cation Demineralizer was placed in service with a HIGHER boron concentration than the RCS. Enter 0POP04-RC-0008, Boron Dilution Event, to remove the Cation Demineralizer from service.

**Answer:** B A Cation Demineralizer was placed in service with a LOWER boron concentration than the RCS. Enter 0POP02-CV-0004, Chemical and Volume Control Subsystem, to remove the Cation Demineralizer from service.

**Exam Bank No.:** 2130

**K/A Catalog Number:** 004 A2.33

**Tier:** 2 **Group/Category:** 1

**SRO Importance:** 3.3 **10CFR Reference or SRO Objective:** 55.43(b)(5)

Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Fact that isolating cation demineralizer stops boron dilution and enables restoration of normal boron concentration.

**STP Lesson:** LOT 201.06 **Objective Number:** 507226

Given a description of plant conditions, ANALYZE the conditions and PREDICT how the Chemical and Volume Control System will respond.

**Reference:** OPOP02-CV-0004, Rev. 61

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified From**

**Distractor Justification**

- A: INCORRECT: The control board lineup represents the normal lineup for automatic operation of the Reactor Makeup System and does not mean an RCS boration or dilution are occurring.
- B: CORRECT: The given conditions indicate there is an RCS dilution in progress. If a Cation Demin were placed in service with a boron concentration lower than the RCS, it would remove boron from the RCS resulting in a dilution event. The Cation Demins are placed in & out of service by the normal operating procedure. The Boron Dilution Event procedure is only used during Modes 4, 5, or 6 when the RCP's are secured.
- C: INCORRECT: The control board lineup indicates ONE of the valves for adding Reactor Makeup Water is open, but the conditions for auto makeup do not exist therefore there is no additions being made to the VCT. Additionally, the Boron Dilution Event procedure is only used during Modes 4, 5, or 6 when the RCP's are secured.
- D: INCORRECT: A Cation Demini with a higher boron concentration than the RCS will result in borating the RCS, not diluting it. A boration of the RCS will cause RCS Tave to lower, not rise. Additionally, the Boron Dilution Event procedure is only used during Modes 4, 5, or 6 when the RCP's are secured.

**Question Level:** H **Question Difficulty** 3

**Justification:**

Student must be able to determine the cause for the RCS Tave trend based on the given conditions. He/she must know what procedure to implement to mitigate the event occurring.

**Exam Bank No.:** 2131

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 90

Given the following:

- Unit 1 is at 100% power with all systems in a normal lineup.
- A leak rate test was conducted on the 1A SI Accumulator Cold Leg Injection 12” Check Valve, XSI0046A, which indicates leakage of 5.2 gpm.
- Other RCS leakage includes:
  - Unidentified Leakage is 0.25 gpm.
  - Identified Leakage is 8.6 gpm INCLUDING the 5.2 gpm from the leakrate test described above.

What impact will this leakage have on SI Accumulator 1A boron concentration AND what procedure will the Unit Supervisor implement to mitigate the consequences of the leakage?

SI Accumulator 1A Boron Concentration will go  (1) .

The Unit Supervisor will use procedure:  (2)

	(1)	(2)
A	up	OPGP03-ZO-0046, RCS Leakage Monitoring, and implement the monitoring actions of ACTION LEVEL 1 for Identified Leakage.
B	up	OPGP03-ZG-0006, Plant Shutdown from 100% to Hot Standby, to start a Unit Shutdown within 4 hours due to exceeding leakage limits of TS 3.4.6.2 Action ‘C’.
C	down	OPGP03-ZO-0046, RCS Leakage Monitoring, and implement the monitoring actions of ACTION LEVEL 1 for Identified Leakage.
D	down	OPGP03-ZG-0006, Plant Shutdown from 100% to Hot Standby, to start a Unit Shutdown within 4 hours due to exceeding leakage limits of TS 3.4.6.2 Action ‘C’.

**Answer:** D down; OPGP03-ZG-0006, Plant Shutdown from 100% to Hot Standby, to start a Unit Shutdown within 4 hours due to exceeding leakage limits of TS 3.4.6.2 Action ‘C’.

**Exam Bank No.:** 2131

**K/A Catalog Number:** 006 A2.03

**Tier:** 2 **Group/Category:** 1

**SRO Importance:** 3.7 **10CFR Reference or SRO Objective:** 55.43(b)(2)

Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: System Leakage.

**STP Lesson:** LOT 201.02

**Objective Number:** 92102

Given the topic or title of a specification included in the Technical Specifications, or the Technical Requirements Manual (TRM), DESCRIBE the general requirements of the specification to include components or administrative requirements affected, limitations, major time frames involved, major surveillance in order to comply, and the bases for the specification.

**Reference:** Tech Spec 3.4.6.2, OPGP03-ZO-0046, Rev. 7

**Attached Reference**  **Attachment:** OPGP03-ZO-0046, Page 8 - 12 of 20 and TS 3.4.6.2 Pg 3/4 4-20.

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified From**

**Distractor Justification**

- A: INCORRECT: SI Accumulator 1A Boron concentration will go down. OPGP03-ZO-0046 would be used but the leakage indicated by the given conditions would require the monitoring actions of ACTION LEVEL 3.
- B: INCORRECT: SI Accumulator 1A Boron concentration will go down.
- C: INCORRECT: OPGP03-ZO-0046 would be used but the leakage indicated by the given conditions would require the monitoring actions of ACTION LEVEL 3.
- D: CORRECT: Leakage from the RCS to SI Accumulator 1A will cause Boron concentration in the accumulator to go down because RCS Boron concentration will be lower than Accumulator concentration. The leakage exceeds the limits of TS 3.4.6.2 Action C which require the leak to be lowered within 4 hours or be in Hot Shutdown within the next 6 hours.

**Question Level:** H **Question Difficulty** 3

**Justification:**

The student must evaluate given conditions to determine how SI Accumulator boron concentration is affected and the appropriate procedure and action to implement.

**Exam Bank No.:** 2138

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 91

A fire has been reported at the Circ Water Intake Structure (CWIS) in the Switchgear Room. A Plant Operator that was in the room when the fire started has been affected by smoke and needs medical attention.

Which one of the following correctly describes the strategy the Unit Supervisor will use to combat these events?

- A. Refer to the Conduct of Operations Manual and contact the Bay City Fire Department to report to the site because the fire is outside the Protected Area. Additionally, contact site Health Services and have them report to the scene to assist the injured Plant Operator.
- B. Implement 0POP04-ZO-0008, Fire/Explosion. This procedure covers response to the fire at the CWIS AND personnel emergencies caused by fires and explosions.
- C. Refer to the Conduct of Operations Manual and contact the Bay City Fire Department to report to the site because the fire is outside the Protected Area. Implement 0POP04-ZO-0004, Personnel Emergencies, to address the injured Plant Operator.
- D. Implement 0POP04-ZO-0008, Fire/Explosion and 0POP04-ZO-0004, Personnel Emergencies concurrently. 0POP04-ZO-0008 covers response to the fire at the CWIS and 0POP04-ZO-0004 will address the injured Plant Operator.

**Answer:** D Implement 0POP04-ZO-0008, Fire/Explosion and 0POP04-ZO-0004, Personnel Emergencies concurrently. 0POP04-ZO-0008 covers response to the fire at the CWIS and 0POP04-ZO-0004 will address the injured Plant Operator.

**Exam Bank No.:** 2138

**K/A Catalog Number:** G2.4.27

**Tier:** 3 **Group/Category:** 4

**SRO Importance:** 3.9 **10CFR Reference or SRO Objective:** 55.43(b)(5)

Knowledge of "fire in the plant" procedures.

**STP Lesson:** LOT 505.01 **Objective Number:** 92106

Given plant conditions/symptoms, EVALUATE the conditions/symptoms and STATE whether or not the referenced procedure is to be used.

**Reference:** 0POP04-ZO-0004, Rev. 21, and 0POP04-ZO-0008, Rev. 19

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified From**

**Distractor Justification**

- A: INCORRECT: Conduct of Operations does not cover response to fires. 0POP04-ZO-0004 is used for all personnel emergencies.
- B: INCORRECT: 0POP04-ZO-0008 is not used for personnel emergencies.
- C: INCORRECT: Conduct of Operations does not cover response to fires.
- D: CORRECT: 0POP04-ZO-0008 would be used for a fire at the CWIS even though it is outside the protected area. 0POP04-ZO-0004 is used for all personnel emergencies.

**Question Level:** F **Question Difficulty** 3

**Justification:**

The student must have knowledge of the usage requirements of 0POP04-ZO-0004 and 8.



**Exam Bank No.:** 2139

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 92

Given the following:

- Unit 2 is at 100% power with all systems in a normal lineup.
- Instrument Air (IA) and Service Air (SA) pressures are at 90 psig and lowering.
- “IAS HDR PRESS LO” Annunciator is NOT in an alarm condition.
- “SAS HDR PRESS LO” Annunciator is NOT in an alarm condition.
- SA Isolation Valve PV-9785 is open.
- IA Dryer Bypass Valve PV-9983 is closed.
- A Plant Operator has found a SA valve with blown packing that can NOT be isolated.

Which one of the following correctly describes the operational status of the IA and SA systems AND the appropriate action for the Unit Supervisor to perform?

- A. IA Dryer Bypass Valve PV-9983 has failed to automatically open. Enter 0POP04-IA-0001, Loss of Instrument Air, and manually open PV-9983 to raise IA pressure.
- B. The “SAS HDR PRESS LO” Annunciator should be in an alarm condition. Enter 0POP09-AN-08M3 for low SA pressure and MANUALLY open the Unit 2 IA Yard Isolation valve (PV-8568) to crosstie the IA system with Unit 1.
- C. SA Isolation Valve PV-9785 has failed to automatically close. Enter 0POP04-IA-0001, Loss of Instrument Air and manually isolate SA from IA.
- D. The “IAS HDR PRESS LO” Annunciator should be in an alarm condition. Enter 0POP09-AN-08M3 for low IA pressure and open the manual bypass valve for SA Isolation Valve PV-9785 for additional SA flow to IA.

**Answer:** C SA Isolation Valve PV-9785 has failed to close. Enter 0POP04-IA-0001, Loss of Instrument Air and manually isolate SA from IA.

**Exam Bank No.:** 2139

**K/A Catalog Number:** 079 A2.01

**Tier:** 2 **Group/Category:** 2

**SRO Importance:** 3.2 **10CFR Reference or SRO Objective:** 55.43(b)(5)

Ability to (a) predict the impacts of the following malfunctions or operations on the SAS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Cross-connection with IAS.

**STP Lesson:** LOT 505.01 **Objective Number:** 38635

Given an abnormal operating event, PREDICT the symptoms expected to occur in accordance with the appropriate off normal operating procedure.

**Reference:** OPOP04-IA-0001, Rev. 15

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified From**

**Distractor Justification**

- A: INCORRECT: At a system pressure of 90 psig, the IA dryer Bypass valve has not failed to open. This valve is designed to open at 80 psig IA pressure.
- B: INCORRECT: At a system pressure of 90 psig, the "SAS HDR PRESS LO" Annunciator should NOT be in an alarm condition. It alarms at 85 psig. Additionally, IA Yard isolation should close at 90 psig, so opening it would not be the appropriate action.
- C: CORRECT: With the conditions given, the SA Isolation Valve should have closed (closes at 100 psig IA pressure). OPOP04-IA-0001 will have the US close a manual isolation valve to isolate SA from IA.
- D: INCORRECT: The "IAS HDR PRESS LO" Annunciator would be in an alarm condition at 90 psig, but opening the manual SA to IA isolation valve would be an incorrect action for the plant conditions because it would result in depressurizing IA..

**Question Level:** H **Question Difficulty** 3

**Justification:**

The student must evaluate the given conditions to determine the operational status of the IA and SA systems. Additionally, he/she must determine the appropriate procedure to implement.

**Exam Bank No.:** 2143

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 93

While removing Spent Fuel Assemblies from the Reactor Core, a Fuel Assembly Top Nozzle fails causing the Fuel Assembly to drop down to the Reactor Vessel Lower Core Support Plate.

Which one of the following will the Unit Supervisor direct the Control Room Operators to perform in accordance with OPOP04-FH-0001, Fuel Handling Accident?

- A. Sound the Containment Evacuation Alarm and ensure Containment Ventilation Isolation has actuated.
- B. Sound the Containment Evacuation Alarm and ensure Fuel Handling Building HVAC is operating in Emergency Mode.
- C. Make a plant announcement to evacuate the area surrounding the damaged Fuel Assembly and ensure Containment Ventilation Isolation has actuated.
- D. Make a plant announcement to evacuate the area surrounding the damaged Fuel Assembly and ensure Fuel Handling Building HVAC is operating in Emergency Mode.

**Answer:** A Sound the Containment Evacuation Alarm and ensure Containment Ventilation Isolation has actuated.

**Exam Bank No.:** 2143

**K/A Catalog Number:** 103 G2.1.6                      **Tier:** 2    **Group/Category:** 1

**SRO Importance:** 4.8    **10CFR Reference or SRO Objective:** 55.43(b)(7)

Containment System: Ability to manage the control room crew during plant transients.

**STP Lesson:** LOT 505.01            **Objective Number:** 38635

Given an abnormal operating event, PREDICT the symptoms expected to occur in accordance with the appropriate off normal operating procedure.

**Reference:** OPOP04-FH-000, Rev. 16

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New                      **Modified From**

**Distractor Justification**

- A: CORRECT: A Fuel Handling Accident in Containment will require a Containment Evacuation and ensuring a Containment Ventilation Isolation Actuation has automatically occurred or is manually performed to limit the release of radioactive material from the Containment.
- B: INCORRECT: Placing the FHB HVAC in Emergency Mode is only performed if the Fuel Handling Accident is in the FHB.
- C: INCORRECT: Evacuating the area around the damaged fuel assembly would only apply if a new Fuel Assembly is damaged in the FHB.
- D: INCORRECT: Evacuating the area around the damaged fuel assembly would only apply if a new Fuel Assembly is damaged in the FHB. Additionally, placing the FHB HVAC in Emergency Mode is only performed if the Fuel Handling Accident is in the FHB.

**Question Level:** F            **Question Difficulty** 3

**Justification:**

The student must have knowledge of the basic steps in OPOP04-FH-0001 for a fuel handling accident in the Containment.

**Exam Bank No.:** 2136

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 94

Unit 1 is at 100% power with all systems in a normal lineup.

- Radiation Monitor RT-8010A Particulate and Iodine Monitors and Samplers are out of service for maintenance and any required compensatory measures have been implemented.

Subsequently,

- A technician discovers the ALERT and HIGH alarm setpoints for Noble Gas Activity Monitor RT-8010B, have been set too HIGH.

Which one of the following correctly describes the determination the Unit Supervisor would make for Offsite Dose Calculation Manual (ODCM) requirements?

- A. The compensatory measures in place for RT-8010A inoperability will also suffice for RT-8010B inoperability. No additional ODCM actions are required.
- B. Grab samples must be taken for RT-8010B at least once every 12 hrs.
- C. The release of radioactive gaseous effluents from the Unit Vent Stack must be suspended. Direct the Reactor Operator to secure all MAB Exhaust Fans.
- D. The release of radioactive gaseous effluents from the Unit Vent Stack must be suspended. Direct the MAB Watch to isolate the Gaseous Waste Processing System discharge line.

**Answer:** B Grab samples must be taken for RT-8010B at least once every 12 hrs.

**Exam Bank No.:** 2136

**K/A Catalog Number:** G2.3.11

**Tier:** 3 **Group/Category:** 3

**SRO Importance:** 4.3 **10CFR Reference or SRO Objective:** 55.43(b)(1)

Ability to control radiation releases.

**STP Lesson:** LOT 202.41 **Objective Number:** 37872

STATE which Radiation Monitors are covered by Tech. Specs, the Technical Requirements Manual (TRM), or the Offsite Dose Calculation Manual (ODCM) AND DESCRIBE general requirements of the specification to include components or admin requirements, time frames and the bases.

**Reference:** ODCM Section 3/4.3.3.11

**Attached Reference**  **Attachment:** ODCM Section 3/4.3.3.11, pages 17 and 18

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified From**

**Distractor Justification**

- A: INCORRECT: There are 2 channels available on RT-8010 for both Iodine and Particulate sampling. Per the given conditions, RT-8010A Iodine and Particulate channels are inoperable, but RT-8010B Iodine and Particulate channels are still operable therefore there are NO compensatory actions needed to be taken for doing maintenance on RT-8010A. With RT-8010B Noble Gas Monitor setpoints being incorrect, there IS some compensator action required.
- B: CORRECT: If RT-8010 setpoints are non-conservative, ODCM Section 3/4.3.3.11, Action a requires either suspending the release of radioactive gaseous effluents or declaring the channel inoperable. There is no way to completely secure the effluent release from the Unit Vent Stack (no way of isolating the stack) therefore the channel would have to be declared inoperable. ODCM Table 3.3-13, action 49 allows radioactive effluent releases to continue providing grab samples are taken at least once every 12 hrs.
- C: INCORRECT: There is no way to completely secure the effluent release from the Unit Vent Stack (no way of isolating the stack) therefore the channel would have to be declared inoperable.
- D: INCORRECT: There is no way to completely secure the effluent release from the Unit Vent Stack (no way of isolating the stack) therefore the channel would have to be declared inoperable.

**Question Level:** H **Question Difficulty** 3

**Justification:**

The student must be able to evaluate the given conditions using the ODCM and determine necessary compensatory actions.

**Exam Bank No.:** 2142

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 95

Given the following:

- U1 is operating at full power with all systems in a normal lineup.
- On 4/9/2011 the Liquid Radwaste Discharge Rad Monitor, RT-8038, became inoperable.
- Compensatory actions have been put into place to allow Liquid Radwaste discharges to be performed with RT-8038 inoperable.
- A work package is being generated to fix RT-8038.

What would be the appropriate Work Activity Risk (WAR) for performing maintenance on RT-8038 AND by what date would Liquid Radwaste discharges no longer be allowed unless RT-8038 was returned to an operable condition?

	Work Activity Risk (WAR)	Date RT-8038 MUST be returned to an operable condition to continue Liquid Radwaste discharges.
A	Non-Risk Significant	4/23/2011
B	Non-Risk Significant	4/22/2011
C	Medium	4/23/2011
D	Medium	4/22/2011

**Answer:** A Non-Risk Significant; 4/23/2011

**Exam Bank No.:** 2142

**K/A Catalog Number:** 068 G2.2.17

**Tier:** 2 **Group/Category:** 2

**SRO Importance:** 3.8 **10CFR Reference or SRO Objective:** 55.43(b)(1)

Liquid Radwaste System (LRS): Knowledge of the process for managing maintenance activities during power operations, such as risk assessments, work prioritization, and coordination with the transmission system operator.

**STP Lesson:** LOT 503.03 **Objective Number:** 92103

Given the topic or title of a requirement in the Offsite Dose Calculation Manual (ODCM), DESCRIBE the general requirements to include components or administrative requirements affected, limitations, and major time frames involved in order to comply and the bases for the requirement.

**Reference:** ODCM, OPGP03-ZA-0090, Rev. 36

**Attached Reference**  **Attachment:** ODCM Part A, Page 14 and 15 AND OPGP03-ZA-0090 pgs. 10 and 11

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified From**

**Distractor Justification**

- A: CORRECT: IAW OPGP03-ZA-0090, RT-8038 maintenance will be non-risk significant. Per ODCM 3/4 3.3.10, liquid releases can be made without RT-8038 for up to 14 days if specified compensatory measures are taken.
- B: INCORRECT: RT-8038 maintenance will be non-risk significant, as stated. However, the latest date RT-8038 must be returned to service is 4/23 (14 days from the day it was declared inoperable). The date in the distractor of 4/22 is the last day RT-8038 can be inoperable, not the first date it must be operable.
- C: INCORRECT: IAW OPGP03-ZA-0090, RT-8038 maintenance will be non-risk significant. The date of 4/23/2011 is the correct date by which RT-8038 must be declared operable in order to continue to perform liquid releases.
- D: INCORRECT: IAW OPGP03-ZA-0090, RT-8038 maintenance will be non-risk significant. However, the latest date RT-8038 must be returned to service is 4/23 (14 days from the day it was declared inoperable). The date in the distractor of 4/22 is the last day RT-8038 can be inoperable, not the first date it must be operable.

**Question Level:** H **Question Difficulty** 3

**Justification:**

The student must evaluate the given conditions to determine when RT-8038 must be returned to service in order to continue liquid radwaste discharges. Additionally, the student must be able to classify the Work Activity Risk based on references provided.



**Exam Bank No.:** 2122

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 96

Given the following:

- Unit 1 is performing a cooldown to Mode 5.
- RCS temperature is 330 °F.

Subsequently:

- Low frequency on the offsite grid causes a Loss of Offsite Power (LOOP) to Units 1 and 2.
- All systems operated as designed, EXCEPT ESF Diesel Generator # 12 failed to start.

Which one of the below correctly describes the CURRENT Operability AND operating status of the Unit 1 LHSI Pumps?

	# of LHSI Pumps required to be Operable	# of LHSI Pumps ACTUALLY Operable	# of LHSI Pumps Operating
A	3	3	0
B	2	2	0
C	3	2	2
D	2	3	2

**Answer:** B 2; 2; 0

**Exam Bank No.:** 2122

**K/A Catalog Number:** APE 077 AA2.07      **Tier:** 1      **Group/Category:** 1

**SRO Importance:** 4.0      **10CFR Reference or SRO Objective:** 55.43(b)(2)

Ability to determine and interpret the following as they apply to Generator Voltage and Electric Grid Disturbances: Operational Status of Engineered Safety Features

**STP Lesson:** LOT 201.02      **Objective Number:** 92102

Given the topic or title of a specification included in the Technical Specifications, or the Technical Requirements Manual (TRM), DESCRIBE the general requirements of the specification to include components or administrative requirements affected, limitations, major time frames involved, major surveillance in order to comply, and the bases for the specification.

**Reference:** TS 3.5.3.1 (ECCS)

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified From**

#### **Distractor Justification**

- A: INCORRECT: Based on the given RCS temperature, the plant is in Mode 4. TS requires 2 LHSI Pumps be operable in Mode 4, not 3 as stated. Additionally, because ESF DG #12 failed to start, all equipment on ESF 4160v Bus 1B is now inoperable (including LHSI Pump 1B) thus only Trains 'A' and 'C' LHSI Pumps are operable. As stated, there should be no LHSI Pumps operating because there has been no SI actuation..
- B: CORRECT: Based on the given RCS temperature, the plant is in Mode 4. TS requires 2 LHSI Pumps be operable in Mode 4. Following the LOOP the ESF DG's in both units should have started, energized their respective 4160v ESF Buses and undergone a Mode II sequence. However, #12 ESF Diesel did not start which means all the loads on ESF 4160v Bus 1B are inoperable as well (including the 'B' LHSI Pump), thus only Trains 'A' and 'C' LHSI Pumps are operable. There are no LHSI Pumps actually operating because an SI actuation hasn't occurred.
- C: INCORRECT: Based on the given RCS temperature, the plant is in Mode 4. TS requires 2 LHSI Pumps be operable in Mode 4, not 3 as stated. The # of operable LHSI Pumps is 2 as stated, however, there are no LHSI Pumps operating because there has been no SI actuation.
- D: INCORRECT: As stated, 2 LHSI Pumps are required to be operable in Mode 4. Because ESF DG #12 failed to start, all equipment on ESF 4160v Bus 1B is now inoperable (including LHSI Pump 1B) thus only Trains 'A' and 'C' LHSI Pumps are operable. There are no LHSI Pumps operating because there has been no SI actuation.

**Question Level:** H      **Question Difficulty** 3

#### **Justification:**

Student must know the Tech Spec operability requirements for the ECCS in Mode 4 and be able to apply those requirements to the given conditions. Additionally, he/she must be able to determine the operating status of the LHSI Pumps based on the given conditions,

**Exam Bank No.:** 2126

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 97

Given the following:

- Unit 2 is at 100% Power with all systems in a normal lineup.
- Rod Control is in AUTO and Control Bank 'D' Control Rods are at 240 steps.

Subsequently the following occurs:

- Control Bank 'D' Group 2 Control Rods step out in AUTO due to a Rod Control malfunction.
- The Reactor Operator places Rod Control in MANUAL and Control Bank 'D' Group 2 Control Rods stop at 246 steps (DRPI and Group Step Counters agree).
- Attempts to MANUALLY move Control Bank 'D' Group 2 rods are unsuccessful.
- I&C determines Control Bank 'D' Group 2 Control Rods are trippable.

Which one of the following Tech Spec determinations should the Unit Supervisor make?

- A. Declare Control Bank 'D' Group 2 rods inoperable. Restore the affected Control Rods to an Operable status within 72 hours.
- B. Declare Control Bank 'D' Group 2 rods inoperable. Be in Hot Standby within 6 hours.
- C. Declare Control Bank 'D' Group 2 rods inoperable. Reduce Power to less than 75% within 2 hours.
- D. None of the Control Bank 'D' Group 2 Control Rods are outside of alignment criteria therefore they are operable.

**Answer:** A Declare Control Bank 'D' Group 2 rods inoperable. Restore the affected Control Rods to an Operable status within 72 hours.

**Exam Bank No.:** 2126

**K/A Catalog Number:** APE 001 G2.2.42      **Tier:** 1      **Group/Category:** 2

**SRO Importance:** 4.6      **10CFR Reference or SRO Objective:** 55.43(b)(2)

Continuous Rod Withdrawal: Ability to recognize system parameters that are entry-level conditions for Technical Specifications.

**STP Lesson:** LOT 201.18      **Objective Number:** 92102

Given the topic or title of a specification included in the Technical Specifications, or the Technical Requirements Manual (TRM), DESCRIBE the general requirements of the specification to include components or administrative requirements affected, limitations, major time frames involved, major surveillance in order to comply, and the bases for the specification.

**Reference:** Tech Spec Section 3/4.1.3, U2 COLR Figure 5.

**Attached Reference**  **Attachment:** Technical Specifications PG 3/4 1-16 and 1-17, U2 Cycle 15 COLR Figure 5, Control Rod Insertion Limits (COLR pg. 12 of 16)

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified From**

**Distractor Justification**

- A: CORRECT: The affected rods are inoperable because they cannot be moved. TS 3.1.3.1 Action C applies. With more than one rod trippable but inoperable and aligned within 12 steps of Control Rod Group 1 rods restore the rods to operable status within 72 hrs.
- B: INCORRECT: This action would apply to rods that are untrippable.
- C: INCORRECT: This part of TS actions would apply to just 1 control rod that is inoperable and misaligned by more than 12 steps.
- D: INCORRECT: The affected control rods are within alignment criteria, but still must be declared inoperable because they cannot be moved.

**Question Level:** H      **Question Difficulty** 3

**Justification:**

The student must evaluate the condition and apply the correct Tech Specs.

**Exam Bank No.:** 2133

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 98

Given the following:

- Unit 2 is at 100% power with all systems in a normal lineup.
- A 24 hour run is in progress for Standby Diesel Generator (DG) #22 per 0PSP03-DG-0017, Standby Diesel 22 Twenty-Four Hour Load Test.
- Fuel Oil Storage Tank (FOST) level for Standby DG #22 was at 62860 gallons when the 24 hour loaded run time began.
- Standby DG #22 has been running for 5 hours since the start of the 24 hour loaded run.

The following trend of fuel oil usage is being recorded on ICS.

Time Hours	0	1	2	3	4	5
Load AVG KW	5900	5900	5900	5250	5250	5250
Level Gallons	62860	62480	62100	61745	61390	61035

If the surveillance continues at the current load and the FOST is not filled, how many more hours can Standby DG #22 run and still remain Operable per Tech. Specs?

- A. 1.5 Hours
- B. 2.9 Hours
- C. 4.0 Hours
- D. 5.5 Hours

**Answer:** A 1.5 Hours

**Exam Bank No.:** 2133

**K/A Catalog Number:** 064 G2.4.47      **Tier:** 2      **Group/Category:** 1

**SRO Importance:** 4.2      **10CFR Reference or SRO Objective:** 55.43(b)(2)

Emergency Diesel Generator (ED/G) System: Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.

**STP Lesson:** LOT 201.39      **Objective Number:** 92102

Given the topic or title of a specification included in the Technical Specifications, or the Technical Requirements Manual (TRM), DESCRIBE the general requirements of the specification to include components or administrative requirements affected, limitations, major time frames involved, major surveillance in order to comply, and the bases for the specification.

**Reference:** TS 3.8.1.1

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New      **Modified From**

**Distractor Justification**

- A: CORRECT: Using the TS required level of 60500 gallons (from memory) and the given trend, it will take 1.5 hours. The given trend indicates more fuel usage in the first two hours because of higher load which is IAW the surveillance. The remaining 22 hours are performed at a slightly lower load and thus slightly less fuel consumption.
- B: INCORRECT: Based on incorrect knowledge of DG FOST TS level (60000 gal)
- C: INCORRECT: Based on incorrect knowledge of DG FOST TS level (59500 gal).
- D: INCORRECT: Based on incorrect knowledge of DG FOST TS level (59000 gal).

**Question Level:** H      **Question Difficulty** 3

**Justification:**

The student must evaluate the given trend and have knowledge of TS 3.8.1.1 fuel oil requirements to determine how much time the DG can continue to run without exceeding TS limits.

**Exam Bank No.:** 2135

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 99

Which two (2) of the following Chemistry parameters have ACTION LEVEL LIMITS in accordance with TRM 3.4.7, RCS Chemistry Limits?

- 1) Chloride
- 2) Hydrazine
- 3) pH
- 4) Fluoride

- A. 1 and 2
- B. 2 and 3
- C. 3 and 4
- D. 1 and 4

**Answer:** D 1 and 4

**Exam Bank No.:** 2135

**K/A Catalog Number:** G2.1.34

**Tier:** 3 **Group/Category:** 1

**SRO Importance:** 3.5 **10CFR Reference or SRO Objective:** 55.43(b)(2)

Knowledge of Primary and Secondary Plant Chemistry limits.

**STP Lesson:** LOT 201.23 **Objective Number:** 92102

Given the topic or title of a specification included in the Technical Specifications, or the Technical Requirements Manual (TRM), DESCRIBE the general requirements of the specification to include components or administrative requirements affected, limitations, major time frames involved, major surveillance in order to comply, and the bases for the specification.

**Reference:** TRM 3.4.7

**Attached Reference**  **Attachment:**

**NRC Reference Req'd**  **Attachment:**

**Source:** New

**Modified From**

**Distractor Justification**

- A: INCORRECT: See justification of correct answer D.
- B: INCORRECT: See justification of correct answer D.
- C: INCORRECT: See justification of correct answer D.
- D: CORRECT: TRM 3.4.7 lists Fluoride, Chloride and Dissolved O<sub>2</sub> as chemistry parameters having Action Level Limits. Hydrazine is used to scavenge O<sub>2</sub> at low temperatures but is not listed. pH would be affected by these other parameters but is not listed.

**Question Level:** F **Question Difficulty** 3

**Justification:**

The student must have knowledge of TRM RCS Chemistry Limits.



**Exam Bank No.:** 2144

**Last used on an NRC exam:** Never

**SRO Sequence Number:** 100

Given the following:

- The Shift Manager declared entry into Tech Spec 3.0.3 with the unit at 10% power.
- Mode 3 conditions were achieved in 2 hours
- Mode 4 was reached in an additional 4 hours

Which of the following describes the maximum time the operators have to achieve Mode 5 conditions and the reason for Tech Spec 3.0.3 entry?

	Maximum time for Mode 5 entry	Tech Spec 3.0.3 entry
A.	24	Entered when the LCO is not met and the condition is not specifically addressed by its associated action requirements
B.	24	Entered when the LCO is not met and the action requirements are not met within the specified time limits.
C.	31	Entered when the LCO is not met and the condition is not specifically addressed by its associated action requirements
D.	31	Entered when the LCO is not met and the action requirements are not met within the specified time limits.

**Answer:** C 31; Entered when the LCO is not met and the condition is not specifically addressed by its associated action requirements

**Exam Bank No.:** 2144

**K/A Catalog Number:** G2.1.32

**Tier:** 3 **Group/Category:** 1

**SRO Importance:** 3.4 **10CFR Reference or SRO Objective:** 55.43(b)(2)

Ability to explain and apply system limits and precautions.

**STP Lesson:** LOT 503.01 **Objective Number:** 92102

Given the topic or title of a specification included in the Technical Specifications, or the Technical Requirements Manual (TRM), DESCRIBE the general requirements of the specification to include components or administrative requirements affected, limitations, major time frames involved, major surveillance in order to comply, and the bases for the specification

**Reference:** TS 3.0.3 and basis

**Attached Reference**  **Attachment:** TS page 3/4 0-1 (page with 3.0.3)

**NRC Reference Req'd**  **Attachment:**

**Source:** Bank

**Modified From**

**Distractor Justification**

- A: INCORRECT: You are not penalized for completing an action before it is required (5 hours in reaching mode 3 and 2 in reaching mode 4), therefore the plant has 31 hours to reach mode 5. The reason for 3.0.3 entry is correct.
- B: INCORRECT: You are not penalized for completing an action before it is required (5 hours in reaching mode 3 and 2 in reaching mode 4), therefore the plant has 31 hours to reach mode 5. Not meeting an action time is a Tech Spec violation, but does not require 3.0.3 entry if the condition is covered by the specification.
- C: CORRECT: The plant has 37 hours total to reach mode 5 from mode 1. Since 6 hours was used getting to mode 4, 31 hours remain. The reason for 3.0.3 entry is correct as described in the basis.
- D: INCORRECT: The hours remaining is correct, the reason for 3.0.3 entry is incorrect as described above.

**Question Level:** H **Question Difficulty** 3

**Justification:**

The candidate must be able to apply the specified limit to the given condition and be able to explain why it would be required.