SRO Written NRC Examination
Cover Sheet

STP Nuclear Operating Company

SRO Written NRC Examination

Applicant Information	
Name:	
Date: 05/01/2014	Facility/Unit: **SOUTH TEXAS PROJECT**
Region: I ☐ II ☐ III ☐ IV ☒	Reactor Type: W ☒ CE ☐ BW ☐ GE ☐
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination you must achieve a final grade of at least 80.00 percent overall, with 70.00 percent or better on the SRO-only items if given in conjunction with the RO exam; SRO-only exams given alone require a final grade of 80.00 percent to pass. You have 8 hours to complete the combined examination, and 3 hours if you are only taking the SRO portion.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

_____
Applicant's Signature

Results	
RO/SRO-Only/Total Examination Values	_____ / _____ / _____ Points
Applicant's Scores	_____ / _____ / _____ Points
Applicant's Grade	_____ / _____ / _____ Percent

Exam Bank No.: 2268 **Last used on an NRC exam:** Never

RO Sequence Number: 1

The fire detectors for an ESF Diesel Generator Fuel Oil Storage Tank Room have lost power.

How is the Fire Protection System effected by this malfunction and what type of fire suppression is used in the ESF Diesel Generator Fuel Oil Storage Tank Room?

	Effect on Fire Protection	Type of Fire Suppression
A.	Trouble Alarm AND Fire Alarm	Foam Water Sprinkler System
B.	Trouble Alarm AND Fire Alarm	Fixed Water Spray Deluge
C.	Trouble alarm ONLY	Foam Water Sprinkler System
D.	Trouble alarm ONLY	Fixed Water Spray Deluge

Answer: C Trouble Alarm ONLY - Foam Water Sprinkler System

Exam Bank No.: 2268

K/A Catalog Number: 086 K6.04 **Tier:** 2 **Group/Category:** 2

RO Importance: 2.6 **10CFR Reference:** 55.41(b)(7)

Knowledge of the effect of a loss or malfunction of the following on the Fire Protection system:
Fire, smoke, and heat detectors.

STP Lesson: LOT 201.29 **Objective Number:** 53554

DESCRIBE the Fire Detection System response to a generic alarm condition to include local panel indications and control room indications.

Reference: LOT 201.29 Lesson Plan Handout Page 12

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because some detector failures will cause both a trouble alarm and a fire alarm (actuation).

B: INCORRECT: This distractor is credible because some detector failures will cause both a trouble alarm and a fire alarm (actuation). Also, a Fixed Water Spray Deluge system is used on other oil systems like Big Transformers and Lube Oil Storage Tanks.

C: CORRECT: A loss of power will cause a trouble alarm ONLY and not a fire alarm (actuation). The ESF DG FOSTs use a Foam-Water Sprinkler System.

D: INCORRECT: This distractor is credible because a Fixed Water Spray Deluge system is used on other oil systems like Big Transformers and Lube Oil Storage Tanks.

Question Level: F **Question Difficulty** 3

Justification:

The student must have fundamental knowledge of the different types of fire protection for different systems and knowledge of basic detector failures with response of the Fire Protection system.

Exam Bank No.: 2272 **Last used on an NRC exam:** Never

RO Sequence Number: 2

In accordance with 0POP01-ZA-0018, Emergency Operating Procedure Users Guide, which of the following are responsibilities of the Reactor Operator?

1. Monitoring Conditional Information Pages for possible required actions
2. Monitor EOP progression to ensure transitions are correct
3. Dispatch Reactor Plant Operators to perform local actions
4. Maintaining awareness of CSF status

A. 1 and 2

B. 2 and 3

C. 3 and 4

D. 1 and 4

Answer: C 3 and 4

Exam Bank No.: 2272

K/A Catalog Number: G2.4.12 **Tier:** 3 **Group/Category:**

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

Knowledge of general operating crew responsibilities during emergency operations.

STP Lesson: LOT 507.01 **Objective Number:** 92183

Given the title of an administrative procedure, identify the individuals (by job title) with specific responsibilities in the procedure.

Reference: POP01-ZA-0018 section 3.0

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: Plausible because all listed responsibilities are contained within the procedure, but incorrect ones are delegated to other positions.

B: INCORRECT: Plausible because all listed responsibilities are contained within the procedure, but incorrect ones are delegated to other positions.

C: CORRECT: This is in accordance with the procedure

D: INCORRECT: Plausible because all listed responsibilities are contained within the procedure, but incorrect ones are delegated to other positions.

Question Level: F **Question Difficulty** 2

Justification:

Knowledge of responsibilities contained within POP01-ZA-0018 is required.

Exam Bank No.: 2255 **Last used on an NRC exam:** Never

RO Sequence Number: 3

Given the following:

- Unit 2 is in a mid-loop condition
- I&C would like to perform corrective maintenance (work order) on the SSPS

In accordance with 0PGP03-ZO-0035, Reduced RCS Inventory Operations, who must approve this work order before work start authorization can be given by the One Stop Shop?

1. Mid-Loop Coordinator
2. Unit Supervisor
3. Shift Manager
4. Outage Manager

A. 1 and 2

B. 1 and 3

C. 2 and 4

D. 3 and 4

Answer: B 1 and 3

Exam Bank No.: 2255

K/A Catalog Number: 012 G2.2.18 **Tier:** 2 **Group/Category:** 1

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

Reactor Protection System: Knowledge of the process for managing maintenance activities during shutdown operations, such as risk assessments, work prioritization, etc.

STP Lesson: LOT 506.02 **Objective Number:** 1000026

DISCUSS THE REDUCED INVENTORY (OPGP03-ZO-0035) AND MID-LOOP (OPOP03-ZG-0009)

Reference: 0PGP03-ZO-0035, section 5.4

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: The given distractors are plausible due to their positions in the organization. Detailed knowledge of the process is needed to determine the correct response.

B: CORRECT: The Mid-Loop coordinator must approve, then the Shift Manager can approve/disapprove

C: INCORRECT: The given distractors are plausible due to their positions in the organization. Detailed knowledge of the process is needed to determine the correct response.

D: INCORRECT: The given distractors are plausible due to their positions in the organization. Detailed knowledge of the process is needed to determine the correct response.

Question Level: F **Question Difficulty** 3

Justification:

The applicant must have knowledge of work control during mid-loop conditions

Exam Bank No.: 2257 **Last used on an NRC exam:** Never

RO Sequence Number: 4

Given the following:

- Unit 1 is in Mode 3
- A small steam leak exists inside containment
- Containment Dewpoint is 45 °F and stable
- A Loss of Offsite Power (LOOP) occurs and the operator has verified all RCFCs have been started by their respective sequencers

Which of the following indicates the expected trend in containment dewpoint and the location in the Control Room where containment dewpoint can be monitored?

	TREND IN DEWPOINT	**LOCATION OF DEWPOINT INDICATION**
A.	Rising	CP-002
B.	Rising	CP-018
C.	Lowering	CP-002
D.	Lowering	CP-018

Answer: A Rising, CP-002

Exam Bank No.: 2257

K/A Catalog Number: 022 A1.03 **Tier:** 2 **Group/Category:** 1

RO Importance: 3.1 **10CFR Reference:** 55.41(b)(5)

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

STP Lesson: LOT 201.01 **Objective Number:** 91026

DESCRIBE the purpose of the following controls and instrumentation and their location(s) for monitoring and indications: C. Temperature and humidity

Reference: LOT201.01 handout page 21,

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: CORRECT: Dewpoint will be rising because following a LOOP, the RCFCs have no cooling (and there is a steam leak in the RCB). Dewpoint indicator is located on CP-002

B: INCORRECT: Plausible because there are numerous indications (including containment temperature and pressure) located on CP-018

C: INCORRECT: Plausible because there are now more RCFCs in operation (4 during normal ops, 6 following the LOOP), however there is no cooling so dewpoint will be rising.

D: INCORRECT: Trend is plausible because there are now more RCFCs in operation (4 during normal ops, 6 following the LOOP), however there is no cooling so dewpoint will be rising. Location is plausible because there are numerous indications (including containment temperature and pressure) located on CP-018

Question Level: H **Question Difficulty** 4

Justification:

Applicant must use the given conditions to determine the effects on containment cooling and then be able to correlate what has happened to the effect on containment dewpoint.

Exam Bank No.: 2261 **Last used on an NRC exam:** Never

RO Sequence Number: 5

Given the following:

- A Safety Injection (SI) Actuation has occurred in Unit 1.
- CCW Pump 1A failed to start.
- A lockout occurred on ESF 4.16 KV Bus E1C.

Subsequently:

- ECW Pump 1B trips.

With the described conditions there is NO heat removal for the…

A. Containment Building HVAC.

B. Electrical Auxiliary Building HVAC.

C. Mechanical Auxiliary Building HVAC.

D. Control Room Envelope HVAC.

Answer: A Containment Building HVAC.

Exam Bank No.: 2261

K/A Catalog Number: 076 K1.09 **Tier:** 2 **Group/Category:** 1

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

Knowledge of the physical connections and/or cause effect relationships between the SWS and the following systems:
Reactor building closed cooling water.

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 Lesson Plan

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: CORRECT: With the given conditions there would be no cooling for CCW and thereby no transfer of heat for the Containment HVAC. Containment HVAC during an SI consists of the RCFCs with CCW going through the cooling coils.

B: INCORRECT: This distractor is credible because with the conditions given EAB HVAC would be affected but there would still be one train of HVAC operating properly from Train A components.

C: INCORRECT: This distractor is credible because with the conditions given MAB HVAC would be affected but there would still be one train of HVAC operating properly from Train A components for ESF equipment plus normal MAB HVAC would still be operating and is not affected by the SI signal.

D: INCORRECT: This distractor is credible because with the conditions given Control Room Envelope HVAC would be affected but there would still be one train of HVAC operating properly from Train A components.

Question Level: H **Question Difficulty** 3

Justification:

The student must be able to predict the operation of the CCW system with the conditions given.

Exam Bank No.: 2262 **Last used on an NRC exam:** Never

RO Sequence Number: 6

Unit 2 is in Mode 6. Core Off-load in progress.

At 1100 hours it was reported that Containment Closure per surveillance 0PSP03-XC-0001, Refueling Containment Penetration Status, is NOT satisfied. It will take 18 hours to correct the issue.

In accordance with 0POP08-FH-0009, Core Refueling, which of the following is the EARLIEST time that Core Off-load must be suspended?

A. 1100 hours

B. 1300 hours

C. 1700 hours

D. 2300 hours

Answer: A 1100 hours

Exam Bank No.: 2262

K/A Catalog Number: 103 K3.03 **Tier:** 2 **Group/Category:** 1

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

Knowledge of the effect that a loss or malfunction of the containment system will have on the following: Loss of containment integrity under refueling operations.

STP Lesson: LOT 201.43 **Objective Number:** 66407

DESCRIBE the procedural requirements of the fuel handling equipment operating procedure(s) to include purpose, scope, precautions and limitations.

Reference: LOT 201.43 Lesson Plan and 0POP08-FH-0009, Core Refueling 5.5.12

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: CORRECT: Core Alterations must be immediately suspended per 0POP08-FH-0009 any time Technical Specification or Technical Requirements Manual Action statements are entered requiring suspension of core alterations and TRM 3.9.4 would not be satisfied.

B: INCORRECT: This distractor is credible because some containment penetrations can remain operable during refueling if the penetration can be capable of being closed within 2 hours but the stem states that it will take 18 hours. See TRM 3.9.4.

C: INCORRECT: This distractor is credible because there are 6 hour requirements in 0POP08-FH-0009 such as the 6 hour grace period for sampling Refuel Canal Boron Concentration.

D: INCORRECT: This distractor is credible because there are 12 hour requirements in the TRM and TS such as that for communications during refueling operations.

Question Level: F **Question Difficulty** 3

Justification:

The student must have knowledge of the procedural requirements of when to suspend core alterations.

Exam Bank No.: 38 **Last used on an NRC exam:** 1999

RO Sequence Number: 7

A rupture has occurred in a Reactor Head Degassing System Storage Tank.

Which of the following Area Radiation Monitors would be the first to reach alarm conditions as a result of this event? (assume all setpoints are the same)

A. RE-8097, PASS Lab

B. RE-8060, MAB Floor Drain Area

C. RE-8061, CCW Coolers

D. RE-8068, Rad Waste Control Room

Answer: B RE-8060, MAB Floor Drain Area

Exam Bank No.: 38

K/A Catalog Number: APE 060 AK2.01 **Tier:** 1 **Group/Category:** 2

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

Knowledge of the interrrelations between the Accidental Gaseous Radwaste Release and the ARM system, including the normal radiation level indications and the operability status.

STP Lesson: LOT 202.42 **Objective Number:** 92125

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

E. Gas Storage Tank (GST) Rupture (RHDS) or rupture of the charcoal beds (GWPS)

Reference: LOT202.42 Rev 3 section 3.2.5

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: INCORRECT - Plausible since the distractor represents another ARM that could alarm. The PASS Lab is in the FHB vice MAB where the storage tanks are located.

B: CORRECT - This monitor is in the vicinity of the RHDS Storage tanks and as delineated in LOT202.42, could reach an alarm condition upon rupture of a storage tank.

C: INCORRECT - Plausible since the distractor represents another ARM that could alarm. The CCW coolers are in the same building on the same elevation but physically not in the same vicinity of the storage tanks such that an alarm condition would not occur.

D: INCORRECT - Plausible since the distractor represents another ARM that could alarm. The Rad Waste Control Room is in the same building, but on a different elevation.

Question Level: F **Question Difficulty** 3

Justification:

Applicant must have knowledge of the areas that each of the monitors covers and together with their knowledge of the design of the HVAC system determine that only a monitor in the vicinity of the storage tanks should reach an alarm condition.

Exam Bank No.: 144 **Last used on an NRC exam:** Never

RO Sequence Number: 8

The reactor is at 100% power.

During surveillance testing a relay fails in the actuated position resulting in an inadvertent Safety Injection and a Reactor Trip. Reactor Trip Breaker R DOES NOT OPEN.

Which of the following describes the affect of Reactor Trip Breaker R failing to open?

A. The Steam Dumps control Tavg using the Load Rejection Controller.

B. The Safety Injection signal cannot be 'Reset/Blocked'.

C. The Main Turbine must be Manually Tripped.

D. The Main and Low-Power Feed Reg valves will NOT close on a Reactor Trip with Lo Tavg (< 574°F) signal.

Answer: B The Safety Injection signal cannot be reset/blocked.

Exam Bank No.: 144

K/A Catalog Number: 013 K1.04 **Tier:** 2 **Group/Category:** 1

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

Knowledge of the physical connections and/or cause effect relationships between the ESFAS and the following systems:
RPS Injection.

STP Lesson: LOT 201.20 **Objective Number:** 3832

DESCRIBE the reactor protection system control and permissive interlocks including inputs, setpoints, coincidence and functions.

Reference: LOT201.20 Lesson Plan Handout Page 50

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because the steam dumps do get a signal from SSPS on how the dumps will be controlled on a reactor trip but it ionly takes one reactor trip breaker being open and the steam dumps would still be controlled by the C-8 reactor trip controller.

B: CORRECT: It takes both reactor trip breakers to be open before the Safty Injection signal can be reset/blocked.

C: INCORRECT: This distractor is credible because the main turbine does get a signal from SSPS but it only takes one reactor trip breaker being open to produce the signal. The main turbine would still automatically trip.

D: INCORRECT: This distractor is credible because Feedwater Isolation does get a signal from SSPS but it only takes one reactor trip breaker being open to produce the signal. The main and low-power feed reg valves would still automatically close.

Question Level: F **Question Difficulty** 3

Justification:

The student must of fundamental knowledge of the inputs, setpoints and logics of the Solid State Protection System.

Exam Bank No.: 292 **Last used on an NRC exam:** Never

RO Sequence Number: 9

0POP05-EO-EO30, Steam Generator Tube Rupture, directs the operator to secure the High Head Safety Injection Pumps if the appropriate criteria are met.

Which of the following describes the basis for this action?

A. Stop Primary to Secondary leakage
Prevent release through the MSSVs
Limit voiding in the vessel head

B. Prevent SG overfill
Prevent release through the MSSVs
Prevent filling the Pressurizer solid

C. Stop Primary to Secondary leakage
Limit voiding in the vessel head
Prevent filling the Pressurizer solid

D. Stop Primary to Secondary leakage
Prevent SG overfill
Prevent release through the MSSVs

Answer: D Stop Primary to Secondary leakage
Prevent SG overfill
Prevent release through the MSSVs

Exam Bank No.: 292

K/A Catalog Number: EPE 038 EK3.06 **Tier:** 1 **Group/Category:** 1

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

Knowledge of the reasons for the following responses as they apply to the SGTR: Actions contained in the EOP for RCS water inventory balance, S/G tube rupture, and plant shutdown procedures.

STP Lesson: LOT 504.15 **Objective Number:** 92408

Given a copy of a step from 0POP05-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: WOG ERG E-3, Rev 2, page 122

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: INCORRECT: Limit voiding in the vessel head - plausible because voiding is a concern whenever a loss of inventory is occuring, however in this case securing SI pumps has the potential to increase voids, not limit.

B: INCORRECT: Prevent filling the Pressurizer solid - plausible because is could occur if SI pumps remain in service, however TMI showed us that is not a reason to secure the pumps.

C: INCORRECT: Limit voiding in the vessel head - plausible because voiding is a concern whenever a loss of inventory is occuring, however in this case securing SI pumps has the potential to increase voids, not limit. Prevent filling the Pressurizer solid - plausible because is could occur if SI pumps remain in service, however TMI showed us that is not a reason to secure the pumps.

D: CORRECT: Per the bases document, all are reasons for SI termination when the criteria are met.

Question Level: F **Question Difficulty** 3

Justification:

Student must have a knowledge of the bases for the SGTR response.

Exam Bank No.: 318 **Last used on an NRC exam:** Never

RO Sequence Number: 10

The following conditions exist on Unit 1:

- A small break LOCA has occurred
- A loss of offsite power occurred simultaneous to the LOCA
- SI injection is not adequate to remove all core decay heat
- Operators are performing the actions of 0POP05-EO-EO00, Reactor Trip or Safety Injection.

Which of the following indicates the expected value at which cold leg temperatures will stabilize?

A. 563 ^{o}F

B. 567 ^{o}F

C. 571 ^{o}F

D. 577 ^{o}F

Answer: C 571 °F

Exam Bank No.: 318

K/A Catalog Number: EPE 009 EK2.03 **Tier:** 1 **Group/Category:** 1

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

Knowledge of the interrelations between the small break LOCA and the following: S/Gs.

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: LOT202.02 handout page 7, LOT501.21 handout page 35

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: INCORRECT: This is the Lo-Lo Tave setpoint which closes all steam dumps and would be experienced if steam dumps were in service and a fault occurred within the steam dump circuitry.

B: INCORRECT: This is where steam dumps would be controlling temperature and would be correct except for the fact that a LOOP has occurred causing all steam dumps to remain closed.

C: CORRECT: Under these conditions, temperature will be controlled by the SG PORV which opens at 1225 psig which corresponds to a temperature of 571 °F

D: INCORRECT: This is the temperature associated with the first SG safety. This would be correct if the SG PORVs were not available. The SG PORVs will fail closed when the LOOP occurs, but normal operation will be restored once the EDGs start and load onto their respective busses.

Question Level: H **Question Difficulty** 3

Justification:

The student must first determine what will be controlling RCS temperature under these conditions (SG PORVs), then using the steam tables and system operation knowledge determine what the temperature will be.

Exam Bank No.: 472 **Last used on an NRC exam:** 1997

RO Sequence Number: 11

A reactor trip with a loss of ALL feedwater has occurred. The crew has entered 0POP05-EO-FRH1, Response to Loss of Secondary Heat Sink, and RCS Bleed and Feed Criteria have been met. Attempts to establish RCS Bleed and Feed produces the following conditions:

- One (1) HHSI Pump - RUNNING
- One (1) Pressurizer PORV - OPEN
- One (1) Reactor Vessel Head Vent path - OPEN

Based on these conditions, determine the adequacy of the RCS Bleed and Feed.

A. Only the RCS Bleed path is NOT adequate

B. Only the RCS Feed path is NOT adequate

C. Both RCS Bleed and Feed paths are NOT adequate

D. Both RCS Bleed and Feed paths are adequate

Answer: A Only the RCS Bleed path is NOT adequate

Exam Bank No.: 472

K/A Catalog Number: EPE E05 EK2.2 **Tier:** 1 **Group/Category:** 1

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

Knowledge of the interrelations between the Loss of Secondary Heat Sink and the following: Facility's heat removal systems, including primary coolant, emergency coolant, and decay heat removal systems, and relationships between the improper operation of these systems to the operation of the facility.

STP Lesson: LOT 504.33 **Objective Number:** 83089

DESCRIBE the indications and anticipated readings used to determine that the Reactor Coolant System bleed path is adequate.

Reference: 0POP05-EO-FRH1, Step 13; WOG ERG-LP Background Document for FR-H.1, Step 15

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: CORRECT: Both PRZR PORVs must be open for an adequate bleed path.

B: INCORRECT: This distractor is credible because one pump running out of three could easily be considered inadequate if the requirements are not known. Since opening the head vent path is included in the procedure, that action could be construed as satisfying the bleed path requirements.

C: INCORRECT: This distractor is credible because one pump running out of three could easily be considered inadequate if the requirements are not known.

D: INCORRECT: This distractor is credible because opening the head vent path is included in the procedure and that action could be construed as satisfying the bleed path requirements.

Question Level: F **Question Difficulty** 3

Justification:

The applicant must understand the requirements for an adequate bleed path

Exam Bank No.: 516 **Last used on an NRC exam:** 1995

RO Sequence Number: 12

Given the following:

- Unit 1 is operating at 92% power with all systems in AUTOMATIC.
- Tavg is indicating 1°F below program Tavg on the T AVG AUCT recorder on CP-005
- First Stage Turbine Pressure PT-505 fails high.

How will the control rod system respond?

(A copy of 0POP04-TM-0004, Failure of Turbine Impulse Pressure Transmitter, Addendum 1, Percent Power VS Program Tave, is provided for reference)

A. Rods will not move.

B. Rods will step out at 6 steps per minute.

C. Rods will step out at 39 steps per minute.

D. Rods will step out at 72 steps per minute.

Answer: B Rods will step out at 6 steps per minute

Exam Bank No.: 516

K/A Catalog Number: APE 001 AK2.06 **Tier:** 1 **Group/Category:** 2

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

Knowledge of the interrelations between the Continuous Rod Withdrawal and the following: T-ave./ref. deviation meter

STP Lesson: LOT 201.18 **Objective Number:** 3160

Describe the operation of the rod control system and components, including design features, limitations, and interlocks (setoints and coincidences).

Reference: LOT201.18, handout 2 (page 3); 0POP04-TM-0004, Addendum 1

Attached Reference ☑ **Attachment:** 0POP04-TM-0004, Addendum 1 Percent Power VS Program Tave

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: INCORRECT: Plausible because this is the speed for a temperature error <1 °F, so the student must accurately determine what actual tamperature is.

B: CORRECT - At 92% power, programmed Tavg is 590 °F. Tavg is 1 °F low, so Tavg is 589 °F. A high failure of PT-505 will cause Tref to go to the high limit of 592 °F. This will result in a 3 °F mismatch between Tavg and Tref. Rod speed for this mismatch is 6 spm.

C: INCORRECT: Plausible because this is the speed for a temperature error of 4 °F, so the student must accurately determine what actual tamperature is.

D: INCORRECT: Plausible because this is the speed for a temperature error of 5 °F, so the student must accurately determine what actual tamperature is.

Question Level: H **Question Difficulty** 3

Justification:

The applicant must determine what actual Tave is based on the given conditions and then use that information to determine what the indicated error for rod control would be. Once the error is determined, knowledge of the rod control system is needed to determine what the rod speed will be.

Auctioneered High Tavg = 592°F

Percent Power	Program Tavg	Percent Power	Program Tavg	Percent Power	Program Tavg	Percent Power	Program Tavg
1	567.25	26	573.50	51	579.75	76	586.00
2	567.50	27	573.75	52	580.00	77	586.25
3	567.75	28	574.00	53	580.25	78	586.50
4	568.00	29	574.25	54	580.50	79	586.75
5	568.25	30	574.50	55	580.75	80	587.00
6	568.50	31	574.75	56	581.00	81	587.25
7	568.75	32	575.00	57	581.25	82	587.50
8	569.00	33	575.25	58	581.50	83	587.75
9	569.25	34	575.50	58	581.75	84	588.00
10	569.50	35	575.75	60	582.00	85	588.25
11	569.75	36	576.00	61	582.25	86	588.50
12	570.00	37	576.25	62	582.50	87	588.75
13	570.25	38	576.50	63	582.75	88	589.00
14	570.50	39	576.75	64	583.00	89	589.25
15	570.75	40	577.00	65	583.25	90	589.50
16	571.00	41	577.25	66	583.50	91	589.75
17	571.25	42	577.50	67	583.75	92	590.00
18	571.50	43	577.75	68	584.00	93	590.25
19	571.75	44	578.00	69	584.25	94	590.50
20	572.00	45	578.25	70	584.50	95	590.75
21	572.25	46	578.50	71	584.75	96	591.00
22	572.50	47	578.75	72	585.00	97	591.25
23	572.75	48	579.00	73	585.25	98	591.50
24	573.00	49	579.25	74	585.50	99	591.75
25	573.25	50	579.50	75	585.75	100	592.00

Exam Bank No.: 650 **Last used on an NRC exam:** 2010

RO Sequence Number: 13

Given the following:

- Unit 1 is operating at 100% power with all systems in a normal alignment.
- Feedwater Pump discharge pressure instrument PT-558 fails off scale high.

Which of the following should be the INITIAL response to this failure?

A. SGFPT speeds rise.

B. SGFPT speeds lower.

C. Main Feedwater Regulating Valves move in the open direction.

D. Main Feedwater Regulating Valves move in the closed direction.

Answer: B SGFPT speeds lower.

Exam Bank No.: 650

K/A Catalog Number: 059 A1.07 **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 MFW controls including:
Feed Pump speed, including normal control speed for ICS.

STP Lesson: LOT 202.14 **Objective Number:** 91949

GIVEN a plant or system condition, PREDICT the operation of the Steam Generator Feed Pump Turbines.

Reference: LOT 202.14

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because if PT-558 failed LOW then SG delta-P would begin to lower below program which would cause pump speed to rise to restore SG delta-P. This would be just the opposite of the failure described.

B: CORRECT: PT-558 failing high will cause delta-P to be higher than program which will result in pump speeds lowering.

C: INCORRECT: This distractor is credible because the MFW Reg Valves will begin to open but AFTER the feedpump speed lowers.

D: INCORRECT: This distractor is credible because the MFW Reg Valves will begin to close but AFTER feedpump speed goes up based on if PT-558 had failed low as described in distractor A..

Question Level: H **Question Difficulty** 3

Justification:

Must be able to determine the effect on SGFPT speed based on the instrument and failure mode provided.

Exam Bank No.: 688 **Last used on an NRC exam:** 2010

RO Sequence Number: 14

In accordance with 0POP05-EO-EO00, Reactor Trip or Safety Injection, which of the following should be the NEXT required action an operator will perform if the Main Turbine does not trip after the operator actuates a MANUAL trip?

A. Dispatch operators to the turbine front standard to mechanically trip the turbine.

B. Close the main turbine governor valves with the governor valve position limiter control.

C. Place both Electro Hydraulic (EH) pumps in the Pull-To-Lock position.

D. Close the MSIVs and ensure the MSIV bypass valves are closed.

Answer: C Place both Electro Hydraulic (EH) pumps in the Pull-To-Lock position.

Exam Bank No.: 688

K/A Catalog Number: G2.4.1 **Tier:** 3 **Group/Category:**

RO Importance: 4.6 **10CFR Reference:** 55.41(b)(10)

Knowledge of EOP entry conditions and immediate action steps.

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

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

Reference: 0POP05-EO-EO00, Step 2 RNO

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: INCORRECT: Plausible because this action would trip the turbine, but it is not in accordance with the procedure. The intent is to trip/isolate the turbine in a timely manner from the control room.

B: INCORRECT: Plausible because this action is performed AFTER the EH pumps are secured to aid in lowering EH pressure more quickly.

C: CORRECT: If the turbine does not trip manually, the next action is for the operator to place EH pumps in pull to lock.

D: INCORRECT: Plausible because this action is only performed after securing EH pumps proves to be unsuccessful.

Question Level: H **Question Difficulty** 3

Justification:

The applicant must compare the given conditions to procedural requirements to determine the correct procedure flowpath and actions to take.

Exam Bank No.: 704 **Last used on an NRC exam:** Never

RO Sequence Number: 15

Given the following:

- Unit 1 is in Mode 4.
- RCS Temperature is 275°F.
- RCS Pressure is 650 psig.
- Maintenance is being performed on CNTMT Pressure Detector PT-0934.
- An inadvertent SI signal is actuated due to maintenance on CNTMT Pressure Detector PT-0934.

Which of the following correctly describes the response of the Safety Injection Accumulators, and the reason for that response?

The SI Accumulators…

A. will NOT discharge into the RCS; the outlet valves are shut with control power removed (Power Lockout Sw.) in accordance with 0POP03-ZG-0007, Plant Cooldown.

B. will NOT discharge into the RCS because RCS pressure is less than P-11.

C. WILL discharge into the RCS because the outlet valves are interlocked to open on an SI signal.

D. WILL discharge into the RCS because the outlet valves are open with control power removed (Power Lockout Sw.) in accordance with 0POP03-ZG-0007, Plant Cooldown.

Answer: A will NOT discharge into the RCS; the outlet valves are shut with control power removed (Power Lockout Sw.) in accordance with 0POP03-ZG-0007, Plant Cooldown.

Exam Bank No.: 704

K/A Catalog Number: 006 K1.03 **Tier:** 2 **Group/Category:** 1

RO Importance: 4.2 **10CFR Reference:** 55.41(b)(7)

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

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: 0POP03-ZG-0007, LOT 201.10

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: CORRECT: The Accumulator outlet valves are closed during a plant cooldown when RCS pressure is 900-1000 psig.

B: INCORRECT: Plausible because the P-11 interlock does have an effect on the accumulator valves, but it acts to open the valves on rising pressure when P-11 is reached if they are not already open.

C: INCORRECT: Plausible because it reasonable to think the accumulator valves would receive an actuation signal upon an SI. The Accumulator valves are NOT interlocked to open on an SI signal.

D: INCORRECT: Plausible because this is the normal configuration in Mode 3 and above. The Accumulator outlet valves are CLOSED during a plant cooldown when RCS pressure is 900-1000 psig.

Question Level: H **Question Difficulty** 3

Justification:

Must be able to determine the response of the Accumulator outlet valves based on the given plant conditions.

Exam Bank No.: 804 **Last used on an NRC exam:** Never

RO Sequence Number: 16

Given the following:

- Unit 1 reactor tripped from 100% power.
- The main turbine did not trip automatically.
- The output breaker for the main generator is closed.

Which of the following describes the PROCEDURAL ACTION required for this situation and the BASIS for this action?

A. Open the generator output breaker to prevent motoring the main generator.

B. Manually trip the turbine to prevent a loss of Heat Sink.

C. Open the generator output breaker to actuate a turbine trip.

D. Manually trip the turbine to prevent an uncontrolled RCS cooldown.

Answer: D Manually trip the turbine to prevent an uncontrolled RCS cooldown.

Exam Bank No.: 804

K/A Catalog Number: EPE 007 G2.4.49 **Tier:** 1 **Group/Category:** 1

RO Importance: 4.6 **10CFR Reference:** 55.41(b)(10)

Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.

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

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

Reference: POP05-EO-EO00; WOG ERG Background for E-0, Step 2

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: INCORRECT: Action and basis are not correct. While opening the generator breaker will prevent motoring, prevention of motoring is a concern for equipment protection. Under the given conditions, cooldown/reactivity are the overriding concern.

B: INCORRECT: Action is correct, basis is not. Given reason is plausible because this condition would eventually lead to a loss of heat sink. However at this time, the subcriticality safety function is of greater concern and the basis for the action.

C: INCORRECT: Action and basis are not correct. Opening the generator breaker will reduce steam flow, but not stop it. A common misconception is that opening of the generator breaker causes a turbine trip, but it does not.

D: CORRECT: Under these conditions, the correct action is to trip the turbine to limit cooldown/reactivity insertion.

Question Level: H **Question Difficulty** 3

Justification:

Student must analyze the given conditions and apply the procedural requirements to determine the correct action. Knowledge of the basis is recall.

Exam Bank No.: 957 **Last used on an NRC exam:** 2011

RO Sequence Number: 17

A Reactor Operator (normally working a 12-hour shift) has worked the following hours (excluding turnover) on the dates indicated:

DATE	HOURS WORKED
4/13/2014	0600 through 2000
4/14/2014	0600 through 1900
4/15/2014	0600 through 2200
4/16/2014	0600 through 2000
4/17/2014	0600 through 2400

Based on ONLY the work periods shown above, which of the following is the date on which this operator FIRST exceeded the overtime limitations of 0PGP03-ZA-0114, Fatigue Rule Program?

A. 4/14/2014

B. 4/15/2014

C. 4/16/2014

D. 4/17/2014

Answer: A 4/14/2014

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: 0PGP03-ZA-0114, Rev. 2

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: CORRECT: a total of 27 hrs. were worked on 4/13 and 4/14. The limit for hrs. worked in a 48 hr. period is 26 hrs. therefore he violated this requirement.

B: INCORRECT: Plausible because he violated the limit for # of hrs. worked in a 48 hr. period, but he had already violated the 48 hr. limit on 4/14 so this occasion was not the first occasion of a violation.

C: INCORRECT: Plausible because the break period is less than 10 hours, but this is not the first violation

D: INCORRECT: Plausible because he violated the allowed # of hrs. worked in a 7 day period after working on 4/17, 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 hour restrictions.

Exam Bank No.: 1034 **Last used on an NRC exam:** 2010

RO Sequence Number: 18

Given the following:

- Unit 1 is in MODE 4.
- RCS temperature is 325°F.
- RCS pressure is 340 psig.
- RHR Train 'B' is in service.
- An un-isolable leak in the Instrument Air (IA) system has occurred.
- IA system pressure is 60 psig and lowering.

Which of the following correctly describes the RHR and RCS system responses?

	RHR HEAT EXCHANGER VALVE FAILURE MODE	**RCS TEMPERATURE ….**
A.	BYP FLOW CONT valve FCV-852 will fail OPEN	Will be LOWER
B.	BYP FLOW CONT valve FCV-852 will fail CLOSED	Will be HIGHER
C.	OUTL TEMP CONT valve HCV-865 will fail OPEN	Will be LOWER
D.	OUTL TEMP CONT valve HCV-865 will fail CLOSED	Will be HIGHER

Answer: C OUTL TEMP CONT valve HCV 865 will fail OPEN; Will be LOWER

Exam Bank No.: 1034

K/A Catalog Number: 005 K6.03 **Tier:** 2 **Group/Category:** 1

RO Importance: 2.5 **10CFR Reference:** 55.41(b)(5)

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, LOT 202.26, LOT 504.02

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: INCORRECT: Plausible because an air operated valve can fail either open or closed and its location in the system will determine its effect (which could be raise or lower temperature). RHR Hx Bypass Valves fail closed on loss of air, not open. If they did fail closed, RCS temperature would lower as indicated.

B: INCORRECT: Plausible because an air operated valve can fail either open or closed and its location in the system will determine its effect (which could be raise or lower temperature). RHR Hx Bypass Valves DO fail closed on loss of air, but that would result in RCS temperature lowering, not rising.

C: CORRECT: The RHR Hx Outlet Temp Cont Valves fail open and the Bypass Flow Cont valves fail closed on a loss of IA. Either of these failures will cause RCS temperature to lower because there is greater heat removal in the RHR Hx.

D: INCORRECT: Plausible because an air operated valve can fail either open or closed and its location in the system will determine its effect (which could be raise or lower temperature). The RHR Hx Outlet Valves fail open on a loss of air. RCS temperature would rise as indicated if they did fail closed.

Question Level: H **Question Difficulty** 3

Justification:

Must know failure modes of RHR Hx valves and be able to determine effect on RCS temperature based on failure of those valves.

Exam Bank No.: 1324 **Last used on an NRC exam:** 2005

RO Sequence Number: 19

Given the following:

- Unit 2 is operating at 100% power with a normal full-power lineup.
- The 125V DC SYSTEM E2D11 TRBL alarm is received in the Control Room.

The operators observe the following indications on CP-003:

- E2D11 Bus volts: 120 VDC
- E2D11 Battery Current: minus (–) 40 amps

Based on these indications, which of the following describes what has occurred?

A. E2D11 Battery output breaker has tripped open.

B. The Standby Battery Charger for 125 VDC Bus E2D11 has automatically assumed the 125 VDC bus loads.

C. The Battery Charger aligned to 125 VDC Bus E2D11 has tripped (de-energized)

D. The Inverter/Rectifier associated with 125 VDC Bus E2D11 has tripped (de-energized).

Answer: C The Battery Charger aligned to 125 VDC Bus E2D11 has tripped (de-energized)

Exam Bank No.: 1324

K/A Catalog Number: 063 A3.01 **Tier:** 2 **Group/Category:** 1

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

Ability to monitor automatic operation of the DC electrical system, including:
Meters, annunciators, dials, recorders, and indicating lights.

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: LOT201.37 Class 1E 125 VDC Electrical Distribution System Student Handout

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: INCORRECT: This is a credible distractor because if the battery output breaker trips it will cause the given alarm but with the voltage and amperage given are not indicative of an open battery output breaker. If the Battery output breaker opens there would be no charging or discharging current and 125 VDC bus volts would be normal (130 vdc).

B: INCORRECT: This distractor is credible because the system has two battery chargers but the standby charger is normally not in service and will not automatically connect to the bus.

C: CORRECT: The inservice battery charger normally supplies dc bus loads and keeps the battery charged. If the battery charger trips, the battery supplies bus loads and the battery output current meter shows the discharge condition (minus amps) relative to the charging condition. Additionally, the bus (battery) voltage will be lower than normal due to the battery now supplying loads.

D: INCORRECT: This distractor is credible because the Inverter/Rectifier associated with 125 VDC Bus E2D11 is a load to the Battery and Charger but a loss of this load will not change 125 VDC Bus E2D11, only reduce the amount of current required from the Battery/Battery Charger.

Question Level: H **Question Difficulty** 3

Justification:

Must be able to determine what has occurred in the 125 VDC electrical lineup based on the given conditions.

Exam Bank No.: 1339 **Last used on an NRC exam:** 2005

RO Sequence Number: 20

Unit 2 is operating at 85% power when SAS ISOL VLV CLOSE annunciates. The operator notes the following header pressures:

- Instrument Air (IA) header pressure = 98 psig
- Service Air (SA) header pressure = 99 psig

While reviewing 0POP09-AN-08M3 for instructions, the operator notes the following header pressures:

- IA header pressure = 100 psig and rising
- SA header pressure = 90 psig and lowering

Given that all systems operate as designed, which of the following describes the status of the Instrument Air System (IAS) and Service Air System (SAS)?

A. A significant leak in the IAS has occurred, and automatic closure of Service Air Isolation Valve (PV-9785) has successfully isolated the leak from the IAS.

B. A significant leak in the SAS has occurred and automatic closure of Service Air Isolation Valve (PV-9785) has successfully isolated the leak from the IAS.

C. A minor leak in the IAS has occurred, and automatic closure of Instrument Air to Yard Valve (PV-8568) has successfully isolated the leak from the remainder of the IAS.

D. A minor leak in the SAS has occurred, and automatic closure of Instrument Air to Yard Valve (PV-8568) has successfully isolated the leak from the remainder of the IAS.

Answer: B A significant leak in the SAS has occurred and automatic closure of Service Air Isolation Valve (PV-9785) has successfully isolated the leak from the IAS.

Exam Bank No.: 1339

K/A Catalog Number: 079 A4.01 **Tier:** 2 **Group/Category:** 2

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

Ability to manually operate and/or moitor in the control room:
Cross-tie vlaves with IAS.

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: 0POP09-AN-08M3, Annunciator Lampbox 1(2)-08M-3 Response Instructions (Rev 35); 0POP04-IA-0001, Loss Of Instrument Air (Rev 14)

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because there was a significant leak as stated, but the leak is in the SAS, not the IAS, as evidenced by IAS pressure recovering after the SAS Isolation Valve closed.

B: CORRECT: The leak is significant because at the given air pressures, all air compressers would be operating yet pressure continues to lower. The leak has been isolated by closure of the Service Air Isolation Valve because service air pressure continues to lower while Instrument air pressure begins to rise.

C: INCORRECT: This distractor is credible because the leak is significant because at the given air pressures, all air compressers would be operating yet pressure continues to lower. Additionally, the leak was in the SAS, not the IAS, and was isolated by the SAS Isolation Valve, not the IA to Yard Isolation Valve because air pressure did not get low enough for the IA to Yard valve to close.

D: INCORRECT: This distractor is credible because the leak is significant because at the given air pressures, all air compressers would be operating yet pressure continues to lower. The leak was in the SAS as stated, but was isolated by the SAS Isolation Valve, not the IA to Yard Isolation Valve because air pressure did not get low enough for the IA to Yard valve to close.

Question Level: H **Question Difficulty** 3

Justification:

Candidate must analyze the change in IAS/SAS header pressures and combine with the knowledge that SAS Isolation Valve automatically closes at 100 psig and all four air compressors are running at 113 psig IA pressure. Since it was given that all systems operate as designed, the SAS Isolation Valve closed at 100 psig (indicated by an decreasing SAS header pressure and increasing IAS header pressure) and successfully isolated the SAS. SA header pressure is decreasing at a significant rate thus the leak is significant (not minor).

Exam Bank No.: 1371 **Last used on an NRC exam:** 2007

RO Sequence Number: 21

Given the following:

- Unit 1 is at 100% power.
- #11 ESF DG is the sole source of power to E1A 4.16 kV Bus
- The crew is preparing to parallel offsite power (normal supply from Standby Bus 1F) to #11 ESF D/G in accordance with 0POP02-DG-0001, Emergency Diesel Generator 11(21).

The operator is preparing to close the Normal Supply Breaker to E1A 4.16 kV Bus.

To properly close the breaker, which of the following sets of indications would be correct?

	SYNCHROSCOPE	DIESEL OUTPUT VOLTAGE
A.	rotating slowly in the SLOW direction	slightly less than XFMR E1A volts
B.	rotating slowly in the SLOW direction	equal to XFMR E1A volts
C.	rotating slowly in the FAST direction	slightly less than XFMR E1A volts
D.	rotating slowly in the FAST direction	equal to XFMR E1A volts

Answer: B rotating slowly in the SLOW direction; equal to XFMR E1A volts.

Exam Bank No.: 1371

K/A Catalog Number: 064 A4.03 **Tier:** 2 **Group/Category:** 1

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

Ability to manually operate and/or monitor in the control room: Synchroscope

STP Lesson: LOT 201.39 **Objective Number:** 44803

DESCRIBE the procedural requirements of the Diesel Generator System Operating Procedure to include purpose, scope, precautions and prerequisites, operating parameters, definitions and evolutions (normal and abnormal).

Reference: POP02-DG-0001 step 9.14

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: INCORRECT - This distractor is credible because the voltage being less than XFMR voltage is opposite of being slightly greater than XFMR voltage when the ESF DG is being parralled to a BUS energized from offsite power.

B: CORRECT - The synchroscope should be in the slow direction so the DG will lose some load and the voltages should be matched to minimize reactive load changes.

C: INCORRECT - This distractor is credible because the synchroscope direction (FAST direction) is correct when the ESF DG is being parralled to a BUS energized from offsite power. Also, the voltage being less than XFMR voltage is opposite of being slightly greater than XFMR voltage when the ESF DG is being parralled to a BUS energized from offsite power.

D: INCORRECT - This distractor is credible because the synchroscope direction (FAST direction) is correct when the ESF DG is being parralled to a BUS energized from offsite power.

Question Level: H **Question Difficulty** 3

Justification:

The applicant must understand that the conditions given do not represent the "normal" paralleling operation (paralleling the DG with offsite power). Since the DG is being paralleled in the opposite direction, the applicant must determine that the synchroscope must rotate in the opposite (slow) direction. Since the reactive loading of the DG is unknown, the applicant should realize that matching voltages is necessary to minimize reactive loading changes on the DG when the normal supply breaker is closed.

Exam Bank No.: 1523 **Last used on an NRC exam:** 2010

RO Sequence Number: 22

Given the following:

- Unit 1 was operating at full power when an automatic Reactor Trip and Safety Injection (SI) occurred.
- The Secondary Operator reports that HHSI Pump 'C' did not start automatically and cannot be started manually using the handswitch.

Which of the following will cause this condition to occur with the HHSI Pump?

A loss of power to:

A. Channel IV 120 VAC Vital Bus

B. Channel III 120 VAC Vital Bus

C. Channel III 125 VDC Vital Bus

D. Channel IV 125 VDC Vital Bus

Answer: D Channel IV 125 VDC Vital Bus

Exam Bank No.: 1523

K/A Catalog Number: 013 K2.01 **Tier:** 2 **Group/Category:** 1

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

Knowledge of bus power supplies to the following:
ESFAS/safeguards equipment control.

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 & LOT 201.37

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: INCORRECT: This distracter is credible because it is correct for the automatic closure because power will be lost to the actuation train. However, loss of power to the actuation train will not prevent the breaker from being closed manually from the handswitch.

B: INCORRECT: This distracter is credible because it indicates the incorrect channel and type of power.

C: INCORRECT: This distracter is credible because it indicates the incorrect channel, but the correct type of power.

D: CORRECT: All 4160V breakers use 125 VDC for breaker control power. 'C' train is associated with Channel IV. A loss of this power will prevent the breaker from being closed automatically or manually from the handswitch.

Question Level: F **Question Difficulty** 3

Justification:

Must know that the 4160v breakers that supply the ESF equipment receive control power from 125 VDC and that 'C' train is associated with Channel IV.

Exam Bank No.: 1554 **Last used on an NRC exam:** Never

RO Sequence Number: 23

Given the following:

- Plant is in Mode 3
- PZR PORV DISCH TEMP HI annunciator is in
- Pressurizer pressure is 1885 psig
- Pressurizer Relief Tank pressure is 25 psig

Based on these conditions, which of the following combinations of Pressurizer PORV tailpipe temperatures and PORV status would be true?

	Tailpipe Temperature	**PORV Status**
A.	629°	Leaking PORV is still open
B.	629°	Leaking PORV has re-seated
C.	240°	Leaking PORV is still open
D.	240°	Leaking PORV has re-seated

Answer: D 240°, Leaking PORV has re-seated

Exam Bank No.: 1554

K/A Catalog Number: APE 008 AK1.01 **Tier:** 1 **Group/Category:** 1

RO Importance: 3.2 **10CFR Reference:** 55.41(b)(14)

Knowledge of the operational implications of the following concepts as they apply to a Pressurizer Vapor Space Accident: Themodynamics and flow characteristics of open or leaking valves.

STP Lesson: LOT 102.55 **Objective Number:** N99999

Explain the process of pressure reduction from throttling using an enthalpy-entropy (h-s) diagram or temperature-entropy (T-s) diagram.

Reference: Thermodynamic fundamentals

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: INCORRECT: Downstream temperature of a Pzr PORV would be much lower. Distractor is plausible if the student believed the downstream temperature is the same as the upstream temperature (common misconception) since 629° is the saturation temperature for 1885 psig.

B: INCORRECT: Downstream temperature of a Pzr Safety would be much lower. Distractor is plausible if the student believed the tailpipe temperature rose to 653° (normal Pzr temp) after the PORV opened (same misconception as above) and is now cooling down because the valve reseated.

C: INCORRECT: Tailpipe temperature is too low for an open/throttled PORV under these conditions. Distractor is plausible is the student understood that the tailpipe temperature would be less than PZR temperature but misuses the Mollier diagram or steam tables (240° is ~saturation temperature for 25 psig)

D: CORRECT - Based on the throttling process, the tailpipe temperature for this condition would be 267 degrees if the valve were open. With the tailpipe at this temperature, it would mean the valve is now closed and the tailpipe is cooling off.

Question Level: H **Question Difficulty** 3

Justification:

Student must utilize knowledge of the throttling process and Mollier diagram and Steam Tables to determine the correct response.

Exam Bank No.: 1661 **Last used on an NRC exam:** 2007

RO Sequence Number: 24

Given the following conditions:

- Unit 1 is operating at full power
- PRT level is rising due to Reactor Makeup Water inleakage
- The PRT PRESS HI alarm annunciates
- The operator verifies the alarm is valid

If PRT pressure continues to rise, which of the below correctly describes the NEXT system action that will occur and the prescribed action for the operator to take that will prevent this occurrence from happening?

A. The PRT relief valve will lift and discharge to the RCB Normal Sump. The operator should lower PRT pressure by venting the PRT.

B. The PRT relief valve will lift and discharge to the RCB Normal Sump. The operator should lower PRT pressure by cooling the PRT.

C. The PRT Rupture Disc will relieve to the RCB atmosphere. The operator should lower PRT pressure by cooling the PRT.

D. The PRT Rupture Disc will relieve to the RCB atmosphere. The operator should lower PRT pressure by venting the PRT.

Answer: D The PRT Rupture Disc will relieve to the RCB atmosphere. The operator should lower PRT pressure by venting the PRT.

Exam Bank No.: 1661

K/A Catalog Number: 007 A2.05 **Tier:** 2 **Group/Category:** 1

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

Ability to (a) predict the impacts of the following malfunctions or operations on the PRTS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Exceeding PRT high-pressure limits

STP Lesson: LOT 201.04 **Objective Number:** 91014

DESCRIBE the overpressure protection scheme for the PRT.

Reference: POP09-AN-04M7, window D1

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: INCORRECT - Plausible because many vessels/tanks utilize a relief valve for overpressure protection, however the PRT does not have a relief valve.

B: INCORRECT - Plausible because many vessels/tanks utilize a relief valve for overpressure protection, however the PRT does not have a relief valve. Depending on the source of the influent, cooling the PRT could lower pressure (but in this case the influent is subcooled).

C: INCORRECT - Plausible because there is procedural direction for cooling and venting the PRT, but since the influent is subcooled, cooling will not give the desired results.

D: CORRECT: Overpressure protection for the PRT is provided by a rupture disc. Since RMW is entering the PRT, it must be vented to lower pressure.

Question Level: F **Question Difficulty** 3

Justification:

The applicant requires an knowledge of PRT design and procedural requirements for a high pressure condition.

Exam Bank No.: 1724 **Last used on an NRC exam:** 2009

RO Sequence Number: 25

Unit 1 is operating at 100% power with all systems in their normal lineup. An RCS leak develops in the Letdown Heat Exchanger room with the following Control Room indications:

- Pressurizer level indicates 57% and stable
- RCS pressure indicates 2235 psig and stable
- VCT level is 35 % and lowering
- LETDN HX OUTLET PRESSURE PI-0135 indicates 360 psig and stable
- LETDOWN HX OUTLET FLOW FI-0132 indicates 70 gpm and stable

Considering these indications, which of the following AUTOMATIC actions has taken place?

A. TCV-0143, Letdown Temperature Divert Valve, positioned to the VCT

B. MOV-0468, Letdown Isolation Valve closed

C. FV-0011, Letdown Header Orifice Isolation Valve closed

D. PCV-0135, Letdown Pressure Control Valve throttled in close direction

Answer: D PCV-0135, Letdown Pressure Control Valve throttled in close direction

Exam Bank No.: 1724

K/A Catalog Number: EPE 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 201.06 **Objective Number:** 3913

DESCRIBE the design features associated with the Chemical and Volume Control System and its major components

Reference: LOT201.06.HO.01, Chemical and Volume Control System

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: INCORRECT: Plausible because the valve will automatically swap to the VCT position, but that would not cause the given indications (flow would be higher and pressure lower due to the leak).

B: INCORRECT: Plausible because the valve does automatically close on low level, however if it did then flow and pressure would be zero.

C: INCORRECT: Plausible because the valve does automatically close on low level or loss of air, however if it did then flow and pressure would be zero.

D: CORRECT: A leak in the letdown hx room will lower L/D pressure(PT-0135) throttling PCV-0135 to close to raise pressure to setpoint(approx. 360 psig). This will lower the indicated L/D flow(FI-0132). The combination of the FI-0132 and the leak will be matched by charging flow control FCV-0205 and PZR level will be returned to setpoint but VCT level will be lowering.

Question Level: H **Question Difficulty** 3

Justification:

Must determine what automatic actions have taken place by analyzing the given conditions.

Exam Bank No.: 1738 **Last used on an NRC exam:** 2011

RO Sequence Number: 26

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

A. RCS pressure lowering to 1850 psig due to a stuck open Pressurizer Safety Valve.

B. Cooling down the plant to 500°F with RCS pressure at 1990 psig.

C. Raising RCS pressure to 1950 psig with RCS temperature at 475°F.

D. Containment pressure rising to 2.7 psig due to a small RCS leak.

Answer: B 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: This distractor is credible because lowering RCS pressure, and thereby temperature, can result in an Auto MSL isolation but lowering RCS pressure to 1850 would result in an SI but it would not be enough to cause an Auto MSL isolation.

B: CORRECT: This condition will result in steamline pressure being less than 735 psig (about 665psig) with Low Steamline Pressure SI still enabled (RCS pressure is greater than P-11, 1985psig), which will result in an Auto SI and MSL isolation.

C: INCORRECT: This distractor is credible because 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 Auto MSL isolation will occur.

D: INCORRECT: This distractor is credible because High RCB pressure will result in an Auto MSL isolation, however the setpoint is 3.0 psig in containment.

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.: 1783 **Last used on an NRC exam:** Never

RO Sequence Number: 27

The following conditions exist in Unit 1:

- Reactor power is steady at 100%.
- Pressurizer Pressure Control Selector Switch is in the P457/456 position.
- Pressurizer Backup Heaters 1D and 1E are energized for boron equalization.
- Pressurizer Pressure Channel PT-457 fails high.

Which of the following correctly describes the plant response to Pressurizer Pressure Channel PT-457 failing high? (Assume NO operator actions are taken.)

A. The Reactor will trip on high Pressurizer pressure.

B. Both Pressurizer Spray Valves will shut when pressure reaches the Pressurizer PORV Interlock (Block) setpoint.

C. The Reactor will trip on low Pressurizer pressure.

D. Backup Heaters 1A and 1B energize when Pressurizer Pressure reaches the Pressurizer PORV Interlock (Block) setpoint.

Answer: C The Reactor will trip on low Pressurizer Pressure.

Exam Bank No.: 1783

K/A Catalog Number: 010 K1.01 **Tier:** 2 **Group/Category:** 1

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

Knowledge of the physical connections and/or cause-effect relationships between the PZR PCS and the following systems: RPS

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

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

Reference: 0POP04-RP-0001, Loss of Automatic Pressurizer Pressure Control Rev 15

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because the stem of the question says the PZR Pressure channel failed high but it takes 2 channels failing high to cause a PZR Pressure high pressure trip.

B: INCORRECT: This distractor is credible because the Pressurizer PORV Interlock (Block) will close PORV 655A (which opened when PT-457 failed high). But this interlock does not have any affect on the Pressurizer Spray Valve(s) operation. The Spray Valves are controlled from the Pressurizer Pressure Master Controller.

C: CORRECT: Pressuirzer Pressure will decrease due to a full open signal for the Pressurizer Spray Valves and an open command for Pressuirzer PORV 655A, both due to the high failure of PT-457. At 2185 psig PORV 655A will close due to PT-458 blocking closed PORV 655A. However, with out operator action the Master Controller is still having a high input from the failed high PT-457 and full spray flow is still occuring causing Pressurizer Pressure to continue to decrease. The reactor will trip on low Pressurizer Pressure of 1870 psig from 2 of 3 channels that are not failed, PT-455, PT-456, and PT-458,

D: INCORRECT: This distractor is credible because the Pressurizer PORV Interlock (Block) will close PORV 655A (which opened when PT-457 failed high). But this interlock does not have any affect on the Pressurizer Backup Heater operation. The Backup Heaters are controlled from the Pressurizer Pressure Master Controller.

Question Level: H **Question Difficulty** 3

Justification:

The candidate must know the plant response to a controlling pressurizer pressure transmitter failure and no operator actions are taken.

Exam Bank No.: 1862 **Last used on an NRC exam:** Never

RO Sequence Number: 28

The following plant conditions exist in Unit 1:

- A plant startup at End of Life (EOL) is in progress in accordance with 0POP03-ZG-0005, Plant Startup to 100%
- Control Rods are in MANUAL.
- Reactor power is currently at 8% and steady.
- Steam Dumps are in Steam Pressure Mode.
- HDR PRESS CONT PK-0557 is in AUTO.

Which of the following correctly describes the plant response if the Steam Dump Pressure Controller, PK-0557 pot setting was to be changed to 8.75? (Normal setting is 8.46)

A. Tavg would remain the same and Reactor power would rise.

B. Tavg would remain the same and Reactor power would lower.

C. Tavg would rise and Reactor power would lower.

D. Tavg would lower and Reactor power would rise.

Answer: C Tavg would rise and Reactor power would lower.

Exam Bank No.: 1862

K/A Catalog Number: G2.2.1 **Tier:** 3 **Group/Category:**

RO Importance: 4.5 **10CFR Reference:** 55.41(b)(4)

Equipment Control: Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.

STP Lesson: LOT 202.09 **Objective Number:** 93002

Given plant conditions, DETERMINE their effects on the Steam Dump System.

Reference: 0POP03-ZG-0005, Plant Startup to 100%, LOT202.09 Steam Dumps

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because raising the potentiomenter setting on PK-0557 will raise the setpoint and steam pressure will then be controlled at a higher pressure. This will raise the saturation temperature inside the steam generator. This higher temperature will then cause RCS temperature to increase. With an RCS temperature increase and a negative MTC, this will cause negative reactivity to be inserted and reactor power will decrease. Therefore Tavg would not remain the same and power would not increase.

B: INCORRECT: This distractor is credible because raising the potentiomenter setting on PK-0557 will raise the setpoint and steam pressure will then be controlled at a higher pressure. This will raise the saturation temperature inside the steam generator. This higher temperature will then cause RCS temperature to increase. With an RCS temperature increase and a negative MTC, this will cause negative reactivity to be inserted and reactor power will decrease. Therefore Tavg would not remain the same. However with the potentiometer change, reactor power would decrease.

C: CORRECT: Raising the potentiomenter setting on PK-0557 will raise the setpoint and steam pressure will then be controlled at a higher pressure. This will raise the saturation temperature inside the steam generator. This higher temperature will then cause RCS temperature to increase. With an RCS temperature increase and a negative MTC, this will cause negative reactivity to be inserted and reactor power will decrease.

D: INCORRECT: This distractor is credible because raising the potentiomenter setting on PK-0557 will raise the setpoint and steam pressure will then be controlled at a higher pressure. This will raise the saturation temperature inside the steam generator. This higher temperature will then cause RCS temperature to increase. With an RCS temperature increase and a negative MTC, this will cause negative reactivity to be inserted and reactor power will decrease. Therefore raising the potentiometer setting does not cause steam pressure to decrease, causing RCS temperature to decrease and add positive reactivity for a reactor power increase.

Question Level: H **Question Difficulty** 3

Justification:

Candidate must understand steam dump operation in the steam pressure mode of operations and the affect on reactivity when the control setpoint is changed.

Exam Bank No.: 2327 **Last used on an NRC exam:** Never

RO Sequence Number: 29

In accordance with 0POP01-ZQ-0022, Plant Operations Shift Routines, which of the following:

1. SHALL be specifically used to complete a Safety Function Checklist AND…
2. Who is responsible for completing the Safety Function Checklist?

	1. Specifically used to complete.	**2. Who is responsible for completing?**
A.	Shift Turnover Checklist	Reactor Operator
B.	Shift Turnover Checklist	Unit Supervisor
C.	Operability Assessment Log	Reactor Operator
D.	Operability Assessment Log	Unit Supervisor

Answer: C Operability Assessment Log - Reactor Operator

Exam Bank No.: 2327

K/A Catalog Number: G2.2.37 **Tier:** 3 **Group/Category:**

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

Ability to determine operability and/or availability of safety related equipment.

STP Lesson: LOT 507.01 **Objective Number:** 92183

Given the title to an administrative procedure, IDENTIFY the individuals (by job title) with specific responsibilities in the procedure.

Reference: 0POP01-ZQ-0022, Plant Operations Shift Routines, for performing Safety Function Checklist.

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because the shift turnover checklist is performed using 0POP01-ZQ-0022 but it is not specifically listed as a source to determine operability of equipment.

B: INCORRECT: This distractor is credible because the shift turnover checklist is performed using 0POP01-ZQ-0022 but it is not specifically listed as a source to determine operability of equipment. Also, even though the Unit Supervisor ultimately determines operability it is the Reactor Operator per 0POP01-ZQ-0022 that is responsible for completing the Safety Function Checklist.

C: CORRECT: The Operability Assessment Log, among other sources such as the Control Boards, Annunciators, etc., is specifically used to determine operability and the Reactor Operator is responsible for completing the Safety Function Checklist.

D: INCORRECT: This distractor is credible because even though the Unit Supervisor ultimately determines operability it is the Reactor Operator per 0POP01-ZQ-0022 that is responsible for performing the Safety Function Checklist.

Question Level: F **Question Difficulty** 3

Justification:

the student must have knowledge of fundamental prinicples involved with determining operability.

Exam Bank No.: 2025 **Last used on an NRC exam:** Never

RO Sequence Number: 30

Given the following:

- Unit 1 is in Mode 6.
- The SSPS MRDS switch is NOT in 'Defeat All' due to surveillance testing.
- A Normal Containment Purge is in progress.
- RT-8012, RCB Purge Exhaust Monitor, has a HIGH alarm condition.
- RT-8013, RCB Purge Exhaust Monitor, has an ALERT alarm condition.

Which of the following correctly describes, if any, automatic actions that occur?

A. No automatic actions will occur.

B. The Normal Containment Purge Valves will close which then will trip the Purge Fans.

C. The Normal Containment Purge Valves will close, but the Purge Fans must be stopped manually.

D. The Normal Containment Purge Fans will stop which then closes the Purge Valves.

Answer: B The Normal Containment Purge Valves will close which then will trip the Purge Fans.

Exam Bank No.: 2025

K/A Catalog Number: APE 061 AA1.01 **Tier:** 1 **Group/Category:** 2

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

Ability to operate and / or monitor the following as they apply to the Area Radiation Monitoring (ARM)System Alarms: Automatic actuation

STP Lesson: LOT 202.33 **Objective Number:** 34358

STATE the automatic actions associated with the Containment Supplementary Purge system when a CVI (containment ventilation isolation) signal is received.

Reference: LOT 202.33 PowerPoint slides 68 and 69

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because if it is believed both monitors high is needed for an actuation and because CVI can be defeated in Mode 5. An actuation CVI will occur if 1 of 2 rad monitors reaches a HIGH alarm.

B: CORRECT: An actuation CVI will occur if 1 of 2 rad monitors reaches a HIGH alarm. This can occur anytime the MRDS switch is not in 'Defeat All.' The CVI will close the purge valves which in turn trip the fans.

C: INCORRECT: This distractor is credible because the CVI actuation signal only goes to the valves. The purge valves do close, but the fans will automatically trip due to the purge valves closing.

D: INCORRECT: This distractor is credible because stopping the fans first makes operational sense (but this is a safety function). The CVI directly controls the purge valves, not the fans.

Question Level: H **Question Difficulty** 3

Justification:

From the given conditions, the applicant must be able to determine if an actuation has occurred and, if so, what actions have taken place.

Exam Bank No.: 2063 **Last used on an NRC exam:** Never

RO Sequence Number: 31

You have been directed to perform a valve lineup on the Seal Injection Filters with the following conditions:

- General area dose rate is 90 mrem/hr.
- Airborne radioactivity exists due to ongoing maintenance activities.
- No environmental conditions exist that preclude the use of a respirator.
- Internal does rate if respirator is worn is 0 mrem/hr.
- Internal dose rate without respirator is 22 mrem/hr.
- Time to complete job while wearing a respirator is 3.0 hours.
- Time to complete job without a respirator is 2.5 hours.

Which of the following describes whether a respirator will be worn and why?

A. No, wearing a respirator will raise total exposure.

B. No, wearing a respirator will make no difference to the total exposure.

C. Yes, wearing a respirator will lower total exposure.

D. Yes, a respirator must be worn any time that airborne radioactivity is present.

Answer: C Yes, wearing a respirator will lower total exposure.

Exam Bank No.: 2063

K/A Catalog Number: G2.3.12 **Tier:** 3 **Group/Category:**

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

Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.

STP Lesson: LOT 103.04 **Objective Number:** N91825

Calculate total dose based on dose rate and stay time,

Reference: LOT103.04, Priciples of Exposure Control

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: INCORRECT: Plausible because it could be true depending on the outcome of the dose calculation, however in this case respirator use will lower total exposure (280 mr without, 270 mr with)

B: INCORRECT: Plausible because it could be true depending on the outcome of the dose calculation, however in this case using a respirator will result in a lower dose.

C: CORRECT: Using a respirator will save 10 mr of dose.

D: INCORRECT: Plausible since on the surface this seems like a good idea, however respirator use is governed by conditions determined for each job.

Question Level: H **Question Difficulty** 2

Justification:

Applicant must be able to determine (calculate) total dose received based on the given conditions with and without a respirator.

Exam Bank No.: 2070 **Last used on an NRC exam:** 2011

RO Sequence Number: 32

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, 0POP04-RA-0001

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified from**

Distractor Justification

A: CORRECT: a specific monitor can be selected by keyihg 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: Plausible because this method of selection is common on computers, however there is no 'cursor' on the RM-11 screen. Specific knowledge of this computer system is needed to disqualify this response.

C: INCORRECT: Plausible because software can use this method of indication, however the indication that a specific monitor has been selected is not correct. Specific knowledge of this computer system is needed to disqualify this response.

D: INCORRECT: Plausible based on software used in other applications. Specific knowledge of this computer system is needed to disqualify this response.

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.: 2233 **Last used on an NRC exam:** Never

RO Sequence Number: 33

Given the following conditions:

- Unit 1 is in Mode 4 performing a cooldown to Mode 5
- RHR trains A and B are in service
- A tube leaks develops in the Train A RHR Heat Exchanger

Which of the following describes the effect of the tube leak and the indications available to the operator to determine if leakage exists?

	EFFECT **Fluid leaks from……**	**INDICATIONS**
A.	RHR to CCW	Surge tank level ONLY
B.	CCW to RHR	Surge tank level ONLY
C.	RHR to CCW	Surge tank level AND Radiation Monitoring
D.	CCW to RHR	Surge tank level AND excore NIs

Answer: C RHR to CCW; Surge tank level AND Radiation Monitoring

Exam Bank No.: 2233

K/A Catalog Number: APE 025 AA2.02 **Tier:** 1 **Group/Category:** 1

RO Importance: 3.4 **10CFR Reference:** 55.41(b)(5)

Ability to determine and interpret the following as they apply to the Loss of Residual Heat Removal System: Leakage of reactor coolant from RHR into closed cooling water system or into reactor building atmosphere

STP Lesson: LOT 201.12 **Objective Number:** 4096

State the potential sources of RCS inleakage to the Component Cooling Water System

Reference: LOT201.12 handout page 20 and 25

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: Leakage direction is correct. Surge tank level is not the only indication available. The CCW system also has a process rad monitor which the student must know exists.

B: INCORRECT: Leakage is in the opposite direction, but numerous CCW loads are at a lower pressure than CCW so the student must have knowledge of relative pressures under these plant conditions. Surge tank level is not the only indication available. If this were to occur as stated, a dilution of the RCS would also be taking place.

C: CORRECT: RHR is at a higher pressure than CCW. Both surge tank level and the CCW rad monitor would be available to diagnose the leak.

D: INCORRECT: Leakage is in the opposite direction, but numerous CCW loads are at a lower pressure than CCW so the student must have knowledge of relative pressures under these plant conditions. If this were to occur, both indications would help the operator to diagnose the leakage.

Question Level: F **Question Difficulty** 3

Justification:

The student must know indications available to determine CCW leakage and relative pressures between CCW and its loads.

Exam Bank No.: 2234 **Last used on an NRC exam:** Never

RO Sequence Number: 34

Unit 1 is operating at 100% power with Component Cooling Water Pump 1C in service.

Both Centrifugal Charging pumps are running. Charging Pump 1A is in service and Charging Pump 1B is running for surveillance testing.

An event occurs that causes CC-FV-4656, SUPPLY X-CONN, and CC-FV-4657, RETURN X-CONN, valves to go closed.

In accordance with 0POP04-CC-0001, Component Cooling Water System Leak, which of the following represents the Charging Pump that would be affected by this event and a MAXIMUM amount of time the affected Charging Pump could run before damage occurs.

A. Charging Pump 1A – 4 minutes

B. Charging Pump 1A – 13 minutes

C. Charging Pump 1B – 4 minutes

D. Charging Pump 1B – 13 minutes

Answer: C Charging Pump 1B - 4 minutes

Exam Bank No.: 2234

K/A Catalog Number: APE 026 AA2.06 **Tier:** 1 **Group/Category:** 1

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

Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water. The length of time after the loss of CCW flow to a component before that component may be damaged.

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: Caution prior to Step 1 of 0POP04-CC-0001, Component Cooling Water Leak.

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because the student has to determine which CCP will be affected. For this event CCP 1A would still have cooling.

B: INCORRECT: This distractor is credible because the student has to determine which CCP will be affected. For this event CCP 1A would still have cooling.

C: CORRECT: The caution prior to step 1 of 0POP04-CC-0001, Component Cooling Water Leak, states that CCP motor failure can occur in as little as 4 minutes with a loss of CCW to the CCP Supplemental Cooler and CCP pump failure can occur in as little as 8 minutes with a loss of CCW to the CCP Lube Oil Cooler. The described event would cause a loss of CCW cooling to CCP 1B.

D: INCORRECT: This distractor is credible because 13 minutes would represent a time when CCP motor and pump damage would occur if CCW was lost to the CCP Supplemental and Lube Oil Cooler.

Question Level: H **Question Difficulty** 3

Justification:

The student must be able to determine and interpret the effects of the CCW event on the Charging Pumps.

Exam Bank No.: 2235 **Last used on an NRC exam:** Never

RO Sequence Number: 35

Given the following conditions:

- Unit 2 is operating at 100% power with all control systems in auto
- Pressurizer Pressure Control Selector Switch is in the 457/456 position
- A malfunction in the Pressurizer Pressure Control System is causing Pressurizer pressure to lower

Which of the following describes the malfunction that would cause this event AND the pressure at which the DNB Parameters Technical Specification (3/4 3.2.5) would FIRST be entered as it lowers?

	Cause	**Pressure at which the DNB Parameters Tech Spec must FIRST be entered**
A.	PT-457 reads 2275 psig	2210 psig
B.	PT-456 reads 2275 psig	2210 psig
C.	PT-457 reads 2275 psig	2200 psig
D.	PT-456 reads 2275 psig	2200 psig

Answer: C PT-457 reads 2275 psig; 2200 psig

Exam Bank No.: 2235

K/A Catalog Number: APE 027 G2.2.38 **Tier:** 1 **Group/Category:** 1

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

Pressurizer Pressure Control Malfunction: Knowledge of conditions and limitations in the facility license.

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

Given plant conditions, determine their effect on the Pressurizer pressure and level control system.

Reference: TS 3.2.5 and COLR; LOT 201.14 PowerPoint slide #32

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: 2210 psig is plausible because it is a pressure associated with the Pressurizer pressure control systems (the pressure at which backup heaters will turn on).

B: INCORRECT: If PT-456 reached 2335 psig, a PORV would open and pressure would lower but that is not the case here. 2210 psig is plausible because it is a pressure associated with the Pressurizer pressure control systems (the pressure at which backup heaters will turn on).

C: CORRECT: The first channel listed on the selector switch is the controlling channel and therefore the one that needs to fail to cause pressure to lower. In this case just the Spray Valves would be open causing PZR pressure to lower. (actual pressure will also lower if the second channel reaches the PORV setpoint of 2335 psig). To prevent entering the DNB TS, pressure must be maintained >2200 psig.

D: INCORRECT: If PT-456 reached 2335 psig, a PORV would open and pressure would lower but that is not the case here.

Question Level: H **Question Difficulty** 3

Justification:

The student must analyze the given conditions and using their knowledge of the control system, determine what malfunction would be the cause. A knowledge of Tech Specs entry conditions is also required.

Exam Bank No.: 2236

Last used on an NRC exam: Never

RO Sequence Number: 36

Which of the following describes reactivity as it pertains to an Anticipated Transient Without Scram (ATWS) and the initiating event that makes an ATWS more severe?

	Reactivity	Initiating Event
A.	Number of neutrons in one generation compared to the number of neutrons in the next generation.	Uncontrolled RCCA Bank Withdrawal
B.	Measure of the departure of the reactor from critical.	Uncontrolled RCCA Bank Withdrawal
C.	Number of neutrons in one generation compared to the number of neutrons in the next generation.	Loss of Feedwater
D.	Measure of the departure of the reactor from critical.	Loss of Feedwater

Answer: D Measure of the departure of the reactor from critical. - Loss of Feedwater

Exam Bank No.: 2236

K/A Catalog Number: EPE 029 EK1.02 **Tier:** 1 **Group/Category:** 1

RO Importance: 2.6 **10CFR Reference:** 55.41(b)(1)

Knowledge of the operational implications of the following concepts as they apply to the ATWS.
Definition of reactivity.

STP Lesson: LOT 502.04 **Objective Number:** 50359

Assuming no operator-initiated recovery technique, ANALYZE the ATWS event leading to core damage.

Reference: LOT 502.04 PPT slide 12 and LOT 101.19 PPT slide 63 Notes

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because it lists a definition for Keff which is a term used in reactor theory. An uncontrolled RCS bank withdrawal is an ATWS initiating event but it is not the most severe.

B: INCORRECT: The reactivity definition is correct but the distractor is credible because an uncontrolled RCS bank withdrawal is an ATWS initiating event but it is not the most severe.

C: INCORRECT: This distractor is credible because it lists a definition for Keff which is a term used in reactor theory even though the Loss of Feedwater is the most severe initiating event.

D: CORRECT: The definition of Reactivity is the measure of a reactor from critical and the most severe ATWS event initiates from a Loss of Feedwater.

Question Level: F **Question Difficulty** 3

Justification:

The student must have fudemental knowledge of reactor theory and the concepts of mitigating core damage.

Exam Bank No.: 2237 **Last used on an NRC exam:** Never

RO Sequence Number: 37

Unit 1 was operating at 100% power when a loss of all Main Feedwater occurred. All Auxiliary Feedwater Pumps started.

Which of the following describes the Auxiliary Feedwater Pumps that have bearing oil pumps and local bearing oil temperature indication?

	Bearing Oil Pump	**Local Bearing Oil Temperature Indication**
A.	Motor Driven Pumps and Terry Turbine	Terry Turbine Only
B.	Motor Driven Pumps and Terry Turbine	Motor Driven Pumps and Terry Turbine
C.	Terry Turbine Only	Terry Turbine Only
D.	Terry Turbine Only	Motor Driven Pumps and Terry Turbine

Answer: C Terry Turbine Only; Terry Turbine Only

Exam Bank No.: 2237

K/A Catalog Number: APE 054 AA1.03 **Tier:** 1 **Group/Category:** 1

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

Ability to operate and/or monitor the following as they apply to the Loss of Main Feedwater (MFW). AFW auxiliaries, including oil cooling water supply.

STP Lesson: LOT 202.28 **Objective Number:** 80173

Discuss the following elements associated with the AFW turbine driven pump: Lubrication System

Reference: LOT 202.28 PPT slide #82

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because some motor driven pumps like the CCPs have oil pumps as part of their auxiliary systems to supply oil to bearings.

B: INCORRECT: This distractor is credible because some motor driven pumps like the CCPs have oil pumps and local temperature indications as part of their auxiliary systems to supply oil to bearings.

C: CORRECT: Only the Terry Turbine uses an bearing oil pump and local bearing oil temperature indication.

D: INCORRECT: This distractor is credible because some motor driven pumps like the CCPs have local temperature indications as part of their auxiliary systems to supply oil to bearings.

Question Level: F **Question Difficulty** 3

Justification:

The student must have knowledge of the auxiliary features of the AFW Pumps.

Exam Bank No.: 2238 **Last used on an NRC exam:** Never

RO Sequence Number: 38

Maintenance is being performed on the under voltage relays for 4.16 KV E1A Bus.

During the maintenance a lock-out occurs on the bus and it takes 20 minutes to restore power to 4.16 KV E1A Bus.

Which of the following is true concerning the Class 1E 125 VDC Systems?

A. E1A11 Battery ONLY was INOPERABLE until power was restored to 4.16 KV E1A Bus.

B. E1A11 Battery and E1D11 Battery were INOPERABLE until power was restored to 4.16 KV E1A Bus.

C. E1A11 Battery ONLY is INOPERABLE. Perform 0PSP06-DJ-0001, 125 Volt Class 1E Battery Monthly Surveillance Test, prior to declaring E1A11 OPERABLE.

D. E1A11 Battery and E1D11 Battery are INOPERABLE. Perform 0PSP06-DJ-0001, 125 Volt Class 1E Battery Monthly Surveillance Test, prior to declaring E1A11 and E1D11 OPERABLE.

Answer: D E1A11 Battery and E1D11 Battery are INOPERABLE. Perform 0PSP06-DJ-0001, 125 Volt Class 1E Battery Monthly Surveillance Test, prior to declaring E1A11 and E1D11 OPERABLE.

Exam Bank No.: 2238

K/A Catalog Number: APE 056 G2.2.21 **Tier:** 1 **Group/Category:** 1

RO Importance: 2.9 **10CFR Reference:** 55.41(b)(8)

Loss of Off-site Power: Knowledge of pre- and post-maintenance operability requirements.

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

Given a loss of all A/C power, PREDICT the operation of the class 1E DC Electrical Distribution System to include automatic actions and interlocks.

Reference: 1POP09-AN-03M2 Window A1 and B1; 0POP02-EE-0001 Section 10

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because E1A11 battery would be operable if power to the 4.16 KV E1A Bus was restored in less than 15 minutes. Also the student must remember that 4.16 KV E1A Bus also supplies power to the E1D11 battery chargers.

B: INCORRECT: This distractor is credible because E1A11 and E1D11 batterys would be operable if power to the 4.16 KV E1A Bus was restored in less than 15 minutes.

C: INCORRECT: This distractor is credible because the student must remember that 4.16 KV E1A Bus also supplies power to the E1D11 battery chargers.

D: CORRECT: E1A11 and E1D11 battery chargers are both powered from 4.16 KV E1A Bus. If the battery chargers are with out power for more than 15 minutes then 0PSP06-DJ-0001 must be performed as a post maintenance activity prior to declaring the E1A11 and E1D11 batterys operable.

Question Level: H **Question Difficulty** 3

Justification:

The student must be able to predict the response of the 125 VDC system for a loss of off-site power.

Exam Bank No.: 2239 **Last used on an NRC exam:** Never

RO Sequence Number: 39

During a Loss of Offsite Power which of the following would describe the Instrument Air operation that would prevent a loss of Instrument Air?

A. IA Compressor #11 running powered from MCC 1G1 and being cooled from a forced air fan.

B. IA Compressor #11 running powered from MCC 1G1 and being cooled from the Emergency Closed Loop Cooling Water Pump.

C. IA Compressor #14 running powered from MCC 1G5 and being cooled from a forced air fan.

D. IA Compressor #14 running powered from MCC 1G5 and being cooled from the Emergency Closed Loop Cooling Water Pump.

Answer: C IA Compressor #14 running powered from MCC 1G5 and being cooled from a forced air fan.

Exam Bank No.: 2239

K/A Catalog Number: 078 K2.01 **Tier:** 2 **Group/Category:** 1

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

Knowledge of bus power supplies to the following: Instrument air compressor

STP Lesson: LOT 202.26 **Objective Number:** 25609

GIVEN a plant or system condition, PREDICT the operation of the Instrument and Service Air system.

Reference: LOT 202.26 PPT slide #47, #83 and #90.

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because IA Compressor #11 is power from MCC 1G1 but it does not have a backup power supply. IA Compressor #11 does not have a forced air fan for cooling but uses the Emergency Closed Loop Cooling Water Pump for back up cooling but it would only be useful if the only problem was a loss o the Closed Loop System.

B: INCORRECT: This distractor is credible because IA Compressor #11 is power from MCC 1G1 but it does not have a backup power supply. IA Compressor #11 uses the Emergency Closed Loop Cooling Water Pump for back up cooling but it would only be useful if the only problem was a loss o the Closed Loop System.

C: CORRECT: IA Compressor #14 gets its power from MCC 1G5 which is backed up by the BOP D/G during a LOOP and cooling is suppoied via an forced air fan that is part of IA Copmpressor #14.

D: INCORRECT: This distractor is credible because IA Compressor #14 gets its power from MCC 1G5 which is backed up by the BOP D/G during a LOOP but it does not have a cooling water supply from the Closed Loop System.

Question Level: H **Question Difficulty** 3

Justification:

The student must be able to predict the operation of the IA system during a loss of offsite power and have knowledge of power supplies and availability during a LOOP.

Exam Bank No.: 2240 **Last used on an NRC exam:** Never

RO Sequence Number: 40

Given the following:

- Unit 1 has experienced a loss of all AC power event.
- ALL lockout relays tripped during the events that led to the loss of all AC power.
- The North Bus is now available to be energized (the South Bus is still not available)
- The crew is ready to energize 4KV ESF Bus E1C using a Standby Transformer.

In addition to the lockout on 4KV ESF Bus E1C, which of the following lockout(s) MUST also be reset to restore power to E1C? List may not be all inclusive.

1. Main Transformer Lockout (86SY) in order to close switchyard breaker Y520
2. Unit 1 Standby Transformer Lockout (86ST1) in order to energize the U1 Standby Transformer
3. Unit 2 Standby Transformer Lockout (86ST2) in order to energize the U2 Standby Transformer

A. 2 ONLY

B. 3 ONLY

C. 1 and 2

D. 1 and 3

Answer: A 2 ONLY

Exam Bank No.: 2240

K/A Catalog Number: EPE 055 EA2.06 **Tier:** 1 **Group/Category:** 1

RO Importance: 307 **10CFR Reference:** 55.41(b)(4)

Ability to determine and interpret the following as they apply to a Station Blackout: Faults and lockouts that must be cleared prior to re-energizing buses.

STP Lesson: LOT 201.30 **Objective Number:** 32156

Discuss protection, control, indications, and alarms in the main control room.

Reference: LOT201.30 handout page 45

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: CORRECT: Resetting the 86ST1 lockout will enable the North bus to be energized (which supplies the U1 Standby Transformer) and the supply breaker to the Standby bus to be closed (which supplies the 4KV bus).

B: INCORRECT: The U2 Standby Transformer is supplied by the South Bus. Plausible if the student believes the North Bus supples the U2 transformer.

C: INCORRECT: This lineup does not require the Y520 breaker to be closed. Plausible because this breaker would be required if the offsite supply being used was through the Unit Aux Transformer instead of the Standby Transformer.

D: INCORRECT: This lineup does not require the Y520 breaker to be closed and the U2 Standby Transformer is not supplied by the North Bus. Plausible if the student were confused as to which bus supplies a given transformwer and because the Y520 would be required if the offsite supply being used was through the Unit Aux Transformer instead of the Standby Transformer.

Question Level: H **Question Difficulty** 3

Justification:

Using the given conditions, the student must determine the electrical flowpath to be used and then determine what lockouts will need to be reset in order to establish the flowpath.

Exam Bank No.: 2241 **Last used on an NRC exam:** Never

RO Sequence Number: 41

Unit 1 is operating at 100% power.

While performing 0PSP03-SP-0005R, SSPS Logic Train R Functional Test, a fire breaks out in the Train R SSPS cabinet and is reported to the Control Room.

Which of the following will the Control Room perform?

Immediately…

A. trip the reactor, evacuate the Control Room and stabilize Unit 1 from the Auxiliary Shutdown Panel.

B. evacuate the Control Room to the Auxiliary Shutdown Panel at which time the reactor will be tripped and Unit 1 stabilized.

C. call the Fire Brigade. If the fire cannot be extinguished within 15 minutes, then trip the reactor, evacuate the Control Room and stabilize Unit 1 from the Auxiliary Shutdown Panel.

D. call the Fire Brigade. If the fire cannot be extinguished within 15 minutes, then evacuate the Control Room to the Auxiliary Shutdown Panel at which time the reactor will be tripped and Unit 1 stabilized.

Answer: A trip the reactor, evacuate the Control Room and stabilize Unit 1 from the Auxiliary Shutdown Panel.

Exam Bank No.: 2241

K/A Catalog Number: APE 067 AA2.13 **Tier:** 1 **Group/Category:** 2

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

Ability to determine and interpret the following as they apply to the Plant Fire on Site:
Need for emergency plant shutdown.

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: LOT 505.01 lesson on 0POP04-ZO-0001, Control Room Evactuation

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: CORRECT: A fire in the relay room requires immediate tripping of the plant followed by evacuation to the Aux Shutdown Panal to stabalize the plant.

B: INCORRECT: This distractor is credible because the reactor could be tripped from outside the Control Room but it would have to be done from the Reactor Switchgear and not the Aux Shutdown Panel.

C: INCORRECT: This distractor is credible because in many instances of fire the fire brigade is immediately contacted. In this case the fire brigade would be contacted but that duty would be delegated to the non affected unit.

D: INCORRECT: This distractor is credible because in many instances of fire the fire brigade is immediately contacted. In this case the fire brigade would be contacted but that duty would be delegated to the non affected unit. Also, the reactor could be tripped from outside the Control Room but it would have to be done from the Reactor Switchgear and not the Aux Shutdown Panel.

Question Level: H **Question Difficulty** 3

Justification:

The student must be able to evaluate the given condition and select the correct response.

Exam Bank No.: 2242 **Last used on an NRC exam:** Never

RO Sequence Number: 42

Unit 1 has experienced a Large Break Loss of Coolant Accident (LBLOCA).

All systems responded normally.

The following conditions exist;

- Cold Leg Recirculation has been established.
- Water level in Containment is continuing to rise.
- Make-up to the CCW Surge Tank and the RCB Chill Water Expansion Tank has been more than normal.

Which Containment Water level listed would be the FIRST to require entry into an ORANGE Path on Containment Integrity and what system leak would be the cause of Containment Water level continuing to rise?

	ORANGE Path on Containment Integrity	**System Leak**
A.	WR Containment Water level is 50”	CCW
B.	WR Containment Water level is 70”	CCW
C.	WR Containment Water level is 50”	RCB Chill Water
D.	WR Containment Water level is 70”	RCB Chill Water

Answer: B Containment Water level is 70" and rising. CCW

Exam Bank No.: 2242

K/A Catalog Number: EPE 015 EK1.1 **Tier:** 1 **Group/Category:** 2

RO Importance: 2.8 **10CFR Reference:** 55.41(b)(8)

Knowledge of the operationsl implications of the following concepts as they apply to the (Containment Flooding);
Components, capacity and function of emergency systems.

STP Lesson: LOT 504.41 **Objective Number:** 83786

STATE/IDENTIFY the indications that are available for identifying unexpected sources of water to the emergency sump.

Reference: LOT 504.41 Lesson Plan PPT

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because the water level listed is close to the required water level for entry into the Containment FRP but is not greater than the required level.

B: CORRECT: An Orange Path on Containment Integrity would be entered on a Containment Water level of greater than or equal to 69". CCW would be the cause of the leak because RCB Chill Water would be isolated to Containment.

C: INCORRECT: This distractor is credible because the water level listed is close to the required water level for entry into the Containment FRP but is not greater than the required level. RCB Chill Water does supply Containment RCFCs but CCW is automatically aligned during an SI.

D: INCORRECT: This distractor is credible because RCB Chill Water does supply Containment RCFCs but CCW is automatically aligned during an SI.

Question Level: H **Question Difficulty** 3

Justification:

The student must be able to evaluate which system would be leaking into Containment and identify when an Orange Path on Containemnt Integrity would be entered.

Exam Bank No.: 2243 **Last used on an NRC exam:** Never

RO Sequence Number: 43

Given the following:

- A Loss of Offsite Power (LOOP) has occurred in Unit 2
- None of the non-class diesel generators automatically started
- Annunciator '250V DC SYSTEM TRBL' on CP-003 is received in the control room
- A Plant Operator investigates and reports that no battery charger is in service for the system

Which of the following describes the action required to restore a battery charger on the 250 VDC system AND the indications available to the operator in the control room?

	ACTION REQUIRED	AVAILABLE INDICATION
A.	Start the TSC DG and place charger #2 in service	Battery charger current ONLY
B.	Start the TSC DG and place charger #2 in service	Battery voltage and battery charger current
C.	Start the BOP DG and place charger #2 in service	Battery charger current ONLY
D.	Start the BOP DG and place charger #2 in service	Battery voltage and battery charger current

Answer: D Start the BOP DG and place charger #2 in service; Battery voltage and battery charger current

Exam Bank No.: 2243

K/A Catalog Number: APE 058 AK1.01 **Tier:** 1 **Group/Category:** 1

RO Importance: 2.8 **10CFR Reference:** 55.41(b)(4)

Knowledge of the operational implications of the following concepts as they apply to Loss of DC Power: Battery charger equipment and instrumentation

STP Lesson: LOT 201.33 **Objective Number:** 63902

GIVEN a loss of all A/C power, PREDICT the operation of the Non-Class 1E DC Electrical Distribution System to include automatic actions and interlocks.

Reference: LOT201.33 PowerPoint slide #12

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: DG is plausible because the TSC DG can also supply a battery charger on both the 48VDC and 125VDC Switchboad 1B systems. Indication is plausible because all indications available locally are not available in the control room.

B: INCORRECT:DG is plausible because the TSC DG can also supply a battery charger on both the 48VDC and 125VDC Switchboad 1B systems.

C: INCORRECT: Indication is plausible because all indications available locally are not available in the control room.

D: CORRECT: The BOP DG can supply a charger on both the 250VDC and and 125VDC Switchboard 1A. Both charger current and battery voltage are available in the control room

Question Level: F **Question Difficulty** 3

Justification:

The student must have knowledge of system design and available control room indications

Exam Bank No.: 2244 **Last used on an NRC exam:** Never

RO Sequence Number: 44

A Small Break Loss of Coolant Accident (SBLOCA) has occurred in Unit 2.

The following conditions exist;

- RCS Pressure is 800 psig and lowering.
- RCPs have been secured.
- CETs are 715ºF and rising.
- The only HHSI Pump running and available is 2C.
- CV-MOV-0025, Charging OCIV, has mechanically failed closed.
- The PDP has been started to supply the RCP seals.
- All LHSI Pumps are running.

In accordance with 0POP05-EO-FRC2, Response to Degraded Core Cooling, the operating crew will next depressurize all intact SGs to 255 psig to…

A. allow for injection of SI Accumulators ONLY.

B. allow for injection of SI Accumulators and flow from the LHSI Pumps.

C. establish sufficient reduction in RCS inventory loss through the break.

D. establish sufficient subcooling in the RCS.

Answer: B allow for injection of SI Accumulators and flow from the LHSI Pumps.

Exam Bank No.: 2244

K/A Catalog Number: 006 A1.17 **Tier:** 2 **Group/Category:** 1

RO Importance: 4.2 **10CFR Reference:** 55.41(b)(5)

Ability to predict and/or moitor changes in parameters (to pevent exceeding design limits) associated with operating the ECCS controls including;
ECCS flow rate.

STP Lesson: LOT 504.31 **Objective Number:** 82974

DESCRIBE the instrumentation available in the Control Room for determining if the Low Head Safety Injection Pumps are running.

Reference: LOT 504.31 Lesson Plan and 0POP05-EO-FRC2, Response to Degraded Core Cooling.

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because if the student mis-calculates the amount of SG depressurization then they might believe the depressurization of SGs is for injection of SI Accumulators only.

B: CORRECT: Depressurizing intact SGs to 255 psig will allow for injection of the SI Accumulators and flow from the LHSI pumps.

C: INCORRECT: This distractor is credible because a reduction in RCS inventory loss will occur through the break but it is the added inventory from the SI Accumulators and the LHSI Pumps that will reduce CET temperatures.

D: INCORRECT: This distractor is credible because in some emergency procedures, like 0POP05-EO-EO30, SGTR, depressurizing SGs is performed for establishing a desired subcooling level but for the condition given in this question it is the need for more inventory.

Question Level: H **Question Difficulty** 3

Justification:

The student must evaluate the given condition and determine the correct response.

Exam Bank No.: 2245 **Last used on an NRC exam:** Never

RO Sequence Number: 45

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 out of service for maintenance.

A lockout occurs on the Unit 1 Standby Transformer.

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

	CCW Pump 'A'	**CCW Pump 'B'**
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.
B.	Receives a strip signal then re-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.
C.	Continues to run; normal bus power source has NOT been lost.	Remains in STANDBY; normal bus power source has NOT been lost.
D.	Receives a strip signal then re-starts from Sequencer on ESF DG due to loss of normal bus power source.	Remains in STANDBY; normal bus power source has NOT been lost.

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.

Exam Bank No.: 2245

K/A Catalog Number: 008 A3.02 **Tier:** 2 **Group/Category:** 1

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

Ability to monitor automatic operation of the CCWS, including;
Operation of the CCW Pumps including interlocks and the CCW booster pump.

STP Lesson: LOT 201.12 **Objective Number:** 57126

DESCRIBE the operation of the Component Cooling Water System and its major components. Include automatic actions, interlocks and trips.

Reference: LOT 201.12 PPT Lesson Plan

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: CORRECT: Train A ESF equipment is normally cross-tied to the Unit Aux Transformer for off-site power so the CCW Pump 1A will stay running. Train B ESF equipment is normally powered from the Unit 1 Standby Transformer so CCW Pump 1B will start on a Mode 2 signal.

B: INCORRECT: This distractor is credible because if the student does not remember that the Train A equipment is cross-tied to the Unit Aux Transformer, then this distractor will be selected.

C: INCORRECT: This distractor is credible because if the student does not remember that the Train B equipment is NOT cross-tied to the Unit Aux Transformer, then this distractor will be selected.

D: INCORRECT: This distractor is credible because if the student does not remember that the Train A equipment is cross-tied to the Unit Aux Transformer, then this distractor will be selected. In addition, the delay time for a CCW pump start on low header pressure is 15 seconds. If the student does not remember this time delay length, then it is credible to believe that CCW Pump 1B would remain in Standby even though CCW Pump 1A stopped and re-started.

Question Level: H **Question Difficulty** 3

Justification:

The student must evaluate the given condition to determine how the CCW Pumps will respond.

Exam Bank No.: 2246 **Last used on an NRC exam:** Never

RO Sequence Number: 46

Unit 1 is at 100% power.

Subsequently a Pressurizer (PZR) Pressure Transient occurs and when the Reactor Operator looks at PZR Pressure and the PZR Pressure Master Controller output the following is noticed:

- Actual PZR Pressure is 2350 psig.
- PZR Pressure Master Controller output is 82% demand.

At these specific values, what will be the position of the PZR Pressure Spray Valves and the PZR Pressure Power Operated Relief Valves (PORV)?

	PZR Spray Valves	**PZR PORVs**
A.	Partially OPEN	Both CLOSED
B.	Partially OPEN	PORV 655A CLOSED & PORV 656A OPEN
C.	Full OPEN	PORV 655A CLOSED & PORV 656A OPEN
D.	Full OPEN	Both CLOSED

Answer: C Full OPEN - PORV 655A CLOSED & PORV 656A OPEN

Exam Bank No.: 2246

K/A Catalog Number: 010 A4.01 **Tier:** 2 **Group/Category:** 1

RO Importance: 3.7 **10CFR Reference:** 55.41(b)(7)

Ability to manually operate and/or monitor in the control room;
PZR Spray Valve

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 PPT Slide #32

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because the student has to remember at which PZR Pressure Master Controller demand the Spray valves are partially open and then full open or full closed. Also, the student must remember that PORV 656A gets a signal directly from PZR Pressure and not the Master Controller.

B: INCORRECT: This distractor is credible because the student has to remember at which PZR Pressure Master Controller demand the Spray valves are partially open and then full open or full closed.

C: CORRECT: At the given values the Spray valves will be full open and PORV 655A, fom the master controller, will be closed, while PORV 656A will be open because it gets a separate signal from actual PZR pressure.

D: INCORRECT: This distractor is credible because the student must remember that PORV 656A gets a signal directly from PZR Pressure and not the Master Controller.

Question Level: H **Question Difficulty** 3

Justification:

The student must be able to predict the response of the PZR Pressure Control System given the specific values of controller output and PZR pressure.

Exam Bank No.: 2247 **Last used on an NRC exam:** Never

RO Sequence Number: 47

The following plant conditions exist in Unit 1:

- Plant is at 100% power.
- 0PSP03-SP-0005R Logic Train R Functional Test surveillance is in progress.
- "Input Error Inhibit" switch has been placed in the "INHIBIT" position in accordance with 0PSP03-SP-0005R, SSPS Logic Train R Functional Test.

Which of the following are effects on the Solid State Protection System (SSPS) with this switch in the "INHIBIT" position?

1. Ensures Logic Train R will not actuate Master Relays during testing by removing 48 VDC from the master relays and replacing it with 15 VDC.
2. Alternately inhibits the data of one train and then the other.
3. Blocks data output from train being tested.
4. An Urgent Alarm is generated for Logic Train R.

A. 1 and 2

B. 2 and 3

C. 3 and 4

D. 1 and 4

Answer: D 1 and 4

Exam Bank No.: 2247

K/A Catalog Number: 012 K4.08 **Tier:** 2 **Group/Category:** 1

RO Importance: 2.8 **10CFR Reference:** 55.41(b)(7)

Knowledge of RPS design feature(s) and/or interlock(s) which provide for the following;
Logic matrix testing.

STP Lesson: LOT 201.20 **Objective Number:** 34904

DESCRIBE the major components and instrumentation associated with the Solid State Protection System.

Reference: LOT 201.20 Lesson Plan Handout Pages 22 to 24

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because it includes a function of the "Multiplexer Test" switch when it is placed in the R+S position.

B: INCORRECT: This distractor is credible because it includes a function of the "Multiplexer Test" switch when it is placed in the R+S position or the INHIBIT position.

C: INCORRECT: This distractor is credible because it includes a function of the "Multiplexer Test" switch when it is placed in the R+S position or the INHIBIT position.

D: CORRECT: When the "Input Error Inhibit" switch is placed in INHIBITseveral functions occur including including removing 48 volt DC from the master relays and replacing with 15 VDC and generation of an Urgent Alarm.

Question Level: F **Question Difficulty** 3

Justification:

The student must have knowledge of the controls associated with the Solid State Protection System.

Exam Bank No.: 2248 **Last used on an NRC exam:** Never

RO Sequence Number: 48

Given the following:

- A plant heatup is being performed in accordance with 0POP03-ZG-0001, Plant Heatup, with RCS temperature currently at 430 °F
- One Pressurizer PORV fails open and does not re-close
- As RCS pressure lowers to 325 psig, the operators notice Pressurizer level rising

Which of the following describes why Pressurizer level is rising?

NOTE: Assume NO manual operator actions have taken place.

Additional liquid is entering the Pressurizer that is now originating from …..

A. the LHSI Pumps.

B. the HHSI Pumps.

C. the Safety Injection Accumulators.

D. a void which has formed in the reactor vessel head.

Answer: D a void which has formed in the reactor vessel head.

Exam Bank No.: 2248

K/A Catalog Number: APE 028 AK3.03 **Tier:** 1 **Group/Category:** 2

RO Importance: 3.5 **10CFR Reference:** 55.41(b)(5)

Knowledge of the reasons for the following responses as they apply to the Pressurizer Level Control Malfunctions: False indication of PZR level when PORV or spray valve is open and RCS saturated

STP Lesson: LOT 502.05 **Objective Number:** 50370

Describe the relationship between the Core Cooling Critical Safety Function and the Inventory Critical Safety Function.

Reference: LOT502.05 handout page 2-28

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: Plausible because it is a possible source of water for the RCS. However, with the given conditions, there would be no reason for the pump to be running (auto SI actuation was not enabled yet).

B: INCORRECT: Plausible because it is a possible source of water for the RCS. However, with the given conditions, there would be no reason for the pump to be running (auto SI actuation was not enabled yet).

C: INCORRECT: Plausible because it is a possible source of water for the RCS. Based on the given conditions, the accumulators have not yet been placed in service (outlet valves would still be closed).

D: CORRECT: The given pressure/temperature conditions results in a saturated RCS leading to a void in the head and a rise in PZR level.

Question Level: H **Question Difficulty** 3

Justification:

Based on the given conditions, the applicant must determine the source of influent into the pressurizer.

Exam Bank No.: 2249 **Last used on an NRC exam:** Never

RO Sequence Number: 49

Unit 1 is at 100% power with all systems in a normal operating alignment.

The following is aligned for Containment Cooling:

- RCB Chillers 11B and 11C are running.
- RCB Chill Water Pumps 11B and 11C are running.
- Reactor Containment Fan Coolers (RCFC) 11B & 11C and 12B & 12C are in service.

Subsequently:

- 4.16 KV Bus 1D2 losses power.

Containment temperature starts to rise because…

A. both RCB Chillers lose power.

B. both RCB Chill Water Pumps lose power.

C. RCB Chiller 11B's Flow Valve, FV-9613, closes.

D. RCFC 11B's and 12B's Flow Valve, FV-0863, closes.

Answer: A both RCB Chillers lose power.

Exam Bank No.: 2249

K/A Catalog Number: 022 K2.02 **Tier:** 2 **Group/Category:** 1

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

Knowledge of power supplies to the following:
Chillers

STP Lesson: LOT 202.32 **Objective Number:** 91942

GIVEN a plant or system condition, PREDICT the operation of the Reactor Containment Chilled Water System.

Reference: LOT 202.32 Lesson Plan Handout Page 8

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: CORRECT: RCB Chillers 11B and 11C are both powered from 4.16 KV Bus 1D2.

B: INCORRECT: This distractor is credible because the student has to remember that RCB Chill Water Pump power comes from separate 480 VAC loads that are not powered through 4.16 KV Bus 1D2.

C: INCORRECT: This distractor is credible because the student has to remember that a loss of power to FV-9613 would fail the valve open and not affect Chill Water flow. Plus, as with the Chill Water Pumps, the flow valve power is not powered through 4.16 KV Bus 1D2.

D: INCORRECT: This distractor is credible because FV-0863 is not powered through 4.16 KV Bus 1D2 even though the valve would fail closed and isolate flow on a loss of power to the valve.

Question Level: F **Question Difficulty** 3

Justification:

The student must have fundamental knowledge of the power supplies for RCB Chill Water System equipment.

Exam Bank No.: 2250 **Last used on an NRC exam:** Never

RO Sequence Number: 50

A Large Break Loss of Coolant Accident (LBLOCA) has occurred in Unit 2.

Refueling Water Storage Tank (RWST) level is lowering.

Which of the following is the FIRST level of the RWST at which transfer to Cold Leg Recirculation would occur and the MANUAL action required after the transfer is complete in accordance with 0POP05-EO-ES13, Transfer to Cold Leg Recirculation?

	RWST Level	MANUAL Action
A.	32,500 Gallons	Manually close RWST to SI Suction Header Isolation Valves ONLY.
B.	75,000 Gallons	Manually close RWST to SI Suction Header Isolation Valves ONLY.
C.	32,500 Gallons	Manually close RWST to SI Suction Header Isolation Valves and, ONE EACH, HHSI and LHSI Pumps Mini Flow Valves.
D.	75,000 Gallons	Manually close RWST to SI Suction Header Isolation Valves and, ONE EACH, HHSI and LHSI Pumps Mini Flow Valves.

Answer: B 75,000 - GallonsManually close RWST to SI Suction Header Isolation Valves ONLY.

Exam Bank No.: 2250

K/A Catalog Number: 026 K4.07 **Tier:** 2 **Group/Category:** 1

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

Knowledge of CSS design feature(s) and/or interlock(s) which provide for the following:
Adequate level in containment sump for suction.

STP Lesson: LOT 201.11 **Objective Number:** 2777

LIST the automatic actions/interlocks associated with the Containment Spray System Components and/or Controls.

Reference: LOT 201.11 Lesson Plan PPT Slide 33 and 0POP05-EO-ES13, Transfer to Cold Leg Recirculation

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because 32,500 gallons in the RWST is an important level but it is not associated with an interlock. It is important for having the operator stop pumps taking a suction from the RWST to prevent pump damage due to loss of suction if they were still taking a suction from the RWST.

B: CORRECT: Transfer to cold leg recirculation begins at 75,000 gallons and lowering in the RWST and the RWST to SI suction header valves ONLY must be manually closed after the transfer.

C: INCORRECT: This distractor is credible because 32,500 gallons in the RWST is an important level but it is not associated with an interlock. It is important for having the operator stop pumps taking a suction from the RWST to prevent pump damage due to loss of suction if they were still taking a suction from the RWST. Also, it is important to ensure the HHSI and LHSI Pump miniflow valves are closed to prevent water from being pumped back into the RWST after the transfer is complete but all of these valves are automatically closed.

D: INCORRECT: This distractor is credible because it is important to ensure the HHSI and LHSI Pump miniflow valves are closed to prevent water from being pumped back into the RWST after the transfer is complete but all of these valves are automatically closed.

Question Level: F **Question Difficulty** 3

Justification:

The student must have fundamental knowledge of Containment Spray and Safety Injection interlocks for transfer to cold leg recirculation and procedural knowledge of the transfer process.

Exam Bank No.: 2251 **Last used on an NRC exam:** Never

RO Sequence Number: 51

Given the following:

- The plant is in Mode 6
- Both Source Range detectors are reading approximately the same
- Due to a power supply malfunction, the detector voltage for NI-31 DROPS such that it is now significantly LOWER than N-32

Which of the following describes the type of detector used by the Source Range NIs and the effect of the lower voltage?

	Detector Type	**NI-31 is reading …….**
A.	BF_3 proportional counter	LESS than NI-32
B.	Compensated ion chamber	LESS than NI-32
C.	BF_3 proportional counter	the SAME as NI-32
D.	Compensated ion chamber	the SAME as NI-32

Answer: A BF3 proportional counter; LESS than NI-32

Exam Bank No.: 2251

K/A Catalog Number: APE 032 AK1.01 **Tier:** 1 **Group/Category:** 2

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

Knowledge of the operational implications of the following concepts as they apply to Loss of Source Range Nuclear Instrumentation: Effects of voltage changes on performance

STP Lesson: LOT 201.16 **Objective Number:** 91246

Discuss the gas filled detector curve region of operation for each Excore Nuclear Instrument.

Reference: LOT201.16 handout pages 3 and 4

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: CORRECT: It is a proportional counter which means the output will be proportional to the voltage causing a lower reading with a lower voltage.

B: INCORRECT: Plausible detector type since other excore Nis are ion chambers

C: INCORRECT: Plausible effect because this would be correct for an ion chamber

D: INCORRECT: Either answer is plausible based on the discussion above

Question Level: F **Question Difficulty** 3

Justification:

A knowledge of NI design and operation is required.

Exam Bank No.: 2252

Last used on an NRC exam: Never

RO Sequence Number: 52

When heating up the Secondary Plant and performing a Plant Startup, the operating procedures have cautions about avoiding Hydraulic Transients (Water Hammer) when operating the Main Steam and Reheat Steam Systems.

Which of the following describes a cause and definition of a Hydraulic Transient?

	CAUSE	DEFINITION
A.	During a manual Cold Start of MSRs, rapidly initiating Main Steam through the Reheat Control Valves.	The shock imposed on piping from initiating steam flow through pipes containing liquid condensate.
B.	When at NOP/NOT, opening a Main Steam Isolation Valve with downstream pressure 60 psig lower.	The shock imposed on piping from initiating steam flow through pipes containing liquid condensate.
C.	During a manual Cold Start of MSRs, rapidly initiating Main Steam through the Reheat Control Valves.	An increase in steam demand with a resultant pressure reduction.
D.	When at NOP/NOT, opening a Main Steam Isolation Valve with downstream pressure 60 psig lower.	An increase in steam demand with a resultant pressure reduction.

Answer: A During a manual Cold Start of MSRs, rapidly initiating Main Steam through the Reheat Control Valves. - The shock imposed on piping from initiating steam flow through pipes containing liquid condensate.

Exam Bank No.: 2252

K/A Catalog Number: 039 K5.01 **Tier:** 2 **Group/Category:** 1

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

Knowledge of the operational implications of the following concepts as they apply to the MRSS: Definition and causes of steam/water hammer.

STP Lesson: LOT 102.57 **Objective Number:** N99862

Explain operational implications of water (fluid) hammer.

Reference: LOT 102.57 Lesson Plan Handout Page 46 and Procedures 0POP03-ZG-0003, Secondary Plant Startup, and 0POP02-MS-0001, Main Steam System.

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: CORRECT: Manually rapidly opening an MSR Reheat Control Valve during a Cold Start (described in 0POP02-MS-0001) can cause water hammer and thereby system damage. Procedure requires valves to be throttled to raise temperature no greater than 100 degrees F per hour. The definition of water hammer includes the shock imposed on piping from initiating steam flow through pipes containing liquid condensate.

B: INCORRECT: This is a credible distractor because it decribes a condition in 0POP03-ZG-0003, where opening the MSIV with a differential pressure of greater than 50 psig can cause the phenomenom of SWELL in the corresponding SG but at the given differential of 60 psig it would not cause water hammer.

C: INCORRECT: This distractor is credible because it describes the definition of SWELL which is related to thermodynamic processes.

D: INCORRECT: This is a credible distractor because it decribes a condition in 0POP03-ZG-0003, where opening the MSIV with a differential pressure of greater than 50 psig can cause the phenomenom of SWELL in the corresponding SG but at the given differential of 60 psig it would not cause water hammer. Also, it describes the definition of SWELL which is related to thermodynamic processes.

Question Level: F **Question Difficulty** 2

Justification:

The student must have fundamental knowledge of thermodynamics and procedures covering Secondary Plant Startup from cold conditions to 100% power.

Exam Bank No.: 2253 **Last used on an NRC exam:** Never

RO Sequence Number: 53

Prior to venting the Pressurizer to atmosphere, 0POP03-ZG-0007, Plant Cooldown, requires that Pressurizer level has been cycled up to approximately 95% Cold Calibrated level at least once using manual control of FCV-0205 and PCV-0135.

Which of the following describes why Pressurizer level must be cycled and the effect PCV-0135 operation has on CVCS letdown?

	WHY PZR LEVEL IS CYCLED	EFFECT OF PCV-0135 OPERATION
A.	Ensure boron in the Pressurizer is equalized with the remainder of the RCS	Opening PCV-0135 LOWERS letdown pressure in the Letdown Heat Exchanger
B.	Ensure the upper Pressurizer metal temperature is reduced	Opening PCV-0135 LOWERS letdown pressure in the Letdown Heat Exchanger
C.	Ensure boron in the Pressurizer is equalized with the remainder of the RCS	Opening PCV-0135 RAISES letdown pressure in the Letdown Heat Exchanger
D.	Ensure the upper Pressurizer metal temperature is reduced	Opening PCV-0135 RAISES letdown pressure in the Letdown Heat Exchanger

Answer: B Ensure the upper Pressurizer metal temperature is reduced; Opening PCV-0135 LOWERS letdown pressure in the Letdown Heat Exchanger

Exam Bank No.: 2253

K/A Catalog Number: 004 K5.46 **Tier:** 2 **Group/Category:** 1

RO Importance: 2.5 **10CFR Reference:** 55.41(b)(5)

Knowledge of the operational implications of the following
concepts as they apply to the CVCS: Reason for going solid in PZR (collapsing steam bubble): make sure no steam is in PRT when PORV is opened to drain RCS

STP Lesson: LOT 506.01 **Objective Number:** 92158

In regards to the referenced procedure, discuss the following: 1) Purpose and Scope, 2) Precautions, 3) Notes and Cautions

Reference: POP03-ZG-0007, note on page 82

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: Plausible because filling the PZR from the RCS will help achieve a boron closer to that of the RCS (but will not equalize).

B: CORRECT: Level is cycled to ensure the PZR is cool. PCV-0135 is a backpressure control valve on the outlet of the letdown heat exchanger.

C: INCORRECT: Plausible because filling the PZR from the RCS will help achieve a boron closer to that of the RCS (but will not equalize). PCV-0135 response is plausible because this could be true depending on the placement of the valve in the system.

D: INCORRECT: PCV-0135 response is plausible because this could be true depending on the placement of the valve in the system.

Question Level: H **Question Difficulty** 3

Justification:

The applicant must understand the reason for the referenced operation of the PZR and must also determine the effect on the CVCS system when PCV-0135 is operated.

Exam Bank No.: 2254 **Last used on an NRC exam:** Never

RO Sequence Number: 54

Given the following:

- A plant cooldown is initiated following a reactor trip using the Auxiliary Feedwater (AFW) System and Steam Generator Power Operated Relief Valves (SG PORVs).
- The plant cooldown started at 0900 hours with AFW Storage Tank level at 521,000 gallons and total AFW flow at 600 gpm.

Which of the following would be the FIRST time the AFW Storage Tank MINIMUM Technical Specification volume would NOT be met?

A. 0955 hours

B. 1015 hours

C. 1055 hours

D. 1115 hours

Answer: B 1015 hours

Exam Bank No.: 2254

K/A Catalog Number: 061 A1.04 **Tier:** 2 **Group/Category:** 1

RO Importance: 3.9 **10CFR Reference:** 55.41(b)(8)

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the AFW controls including:
AFW source tank level.

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: LOT 201.28 Lesson Plan Handout Page 14 and TS 3.7.1.3.

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because it repesents the FIRST time listed at which the low level alarm would come in. About 489,000 gallons.

B: CORRECT: TS level for the AFWST is 485000 gallons. At 600 gpm it would take 60 minutes to reach the TS level if starting at an AFWST level of 521000 gallons. 1015 hours would be the FIRST time listed that would exceed the minimum TS limit at the given rate.

C: INCORRECT: This distractor is credible because it repesents the FIRST time listed at which the TS limit for the RWST would be exceeded. 458,000 gallons.

D: INCORRECT: This distractor is credible because it repesents a miscalculation of the rate of water being used in the AFWST and the distractor is symetrical with the other distractors.

Question Level: H **Question Difficulty** 3

Justification:

This student must be able to predict the use of AFW and then determine when TS level would be exceeded.

Exam Bank No.: 2282 **Last used on an NRC exam:** Never

RO Sequence Number: 55

Unit 2 is at 100% power with all systems in a normal lineup.

RT-8039, Failed Fuel Monitor has been trending up over the last hour and is now above the ALERT set point.

The Control Room Crew enters 0POP04-RC-0001, High Reactor Coolant Activity.

Per 0POP04-RC-0001, High Reactor Coolant Activity, which of the following will validate the ALERT alarm on RT-8039 and describes an action the Control Room Crew should take to mitigate the consequences of the high Reactor Coolant activity.

	Validate High RCS Activity	**Action to Mitigate Consequences**
A.	A Health Physics survey of the VCT.	Raise letdown flow by placing additional letdown orifices in service.
B.	A Health Physics survey of the VCT.	Place the Reactor Coolant Purification pump in service.
C.	A Chemistry sample of the RCS.	Place the Reactor Coolant Purification pump in service.
D.	A Chemistry sample of the RCS.	Raise letdown flow by placing additional letdown orifices in service.

Answer: D A Chemistry sample of the RCS. - Raise letdown flow by placing additional letdown orifices in service.

Exam Bank No.: 2282

K/A Catalog Number: APE 076 G2.1.45 **Tier:** 1 **Group/Category:** 2

RO Importance: 4.3 **10CFR Reference:** 55.41(b)(10)

High Reactor Coolant Activity: Ability to identify and interpret diverse indication to validate the response of another indication.

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: 0POP04-RC-0001, High Reactor Coolant System Activity

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because an Alert alarm on RT-8039 can be validated by a Health Physics survey but it must be done on the letdown lines before the flow goes through the demins and not when flow has reached the VCT.

B: INCORRECT: This distractor is credible because an Alert alarm on RT-8039 can be validated by a Health Physics survey but it must be done on the letdown lines before the flow goes through the demins and not when flow has reached the VCT. Also placing the reactor coolant purification pump in service is listed as an action in the procedure but only if the Unit is in Mode 5.

C: INCORRECT: This distractor is credible because placing the reactor coolant purification pump in service is listed as an action in the procedure but only if the Unit is in Mode 5.

D: CORRECT: A method to validate an Alert alarm on RT-8039 would be to get a chemistry sample of the RCS. To mitigate the consequences of the high RCS activity the procedure will have the operators raise letdown flow to ensure maximum effective purification.

Question Level: H **Question Difficulty** 3

Justification:

The student must be able to evaluate the conditions given and determine the correct action to take regarding high RCS activity.

Exam Bank No.: 2366 **Last used on an NRC exam:** Never

RO Sequence Number: 56

An overload trip has occurred on a breaker.

Which of the following is correct in accordance with the Conduct of Operations, Chapter 2, Section 10.0, General Guidance For Resetting Protective Devices?

The over load device may be reset one time and the breaker closed if the breaker is located in a _____(1)____ and the operation is approved by the _____(2)____?

	(1)	(2)
A.	480V motor control center or electrical distribution panel with same or lower voltages	Unit Supervisor/Shift Manager
B.	480V motor control center or electrical distribution panel with same or lower voltages	Unit Operations Manager
C.	4160V load center or electrical distribution panel with same or lower voltages	Unit Supervisor/Shift Manager
D.	4160V load center or electrical distribution panel with same or lower voltages	Unit Operations Manager

Answer: A 480V motor control center or electrical distribution panel with same or lower voltages; Unit Supervisor/Shift Manager

Exam Bank No.: 2366

K/A Catalog Number: 062 A2.12 **Tier:** 2 **Group/Category:** 1

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

Ability to (a) predict the impacts of the following malfunctions or operations on the ac distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Restoration of power to a system with a fault on it

STP Lesson: LOT 507.01 **Objective Number:** 92183

Given the title of an administrative procedure, identify the individuals (by job title) with specific responsibilities in the procedure.

Reference: COP Chapter 2, Section 10

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: CORRECT: 480V MCC or lower breakers may be reset with the permission of the US/SM

B: INCORRECT: Plausible because the Operations Manager is in charge of the overall conduct of the operations department.

C: INCORRECT: Plausible because it is a higher voltage, but not the highest.

D: INCORRECT: Plausible because it is a higher voltage, but not the highest and the Operations Manager is in charge of the overall conduct of the operations department.

Question Level: F **Question Difficulty** 3

Justification:

The applicant must have a knowledge of the requirements of the Conduct of Operations

Exam Bank No.: 2258 **Last used on an NRC exam:** Never

RO Sequence Number: 57

Five maintenance personnel have entered Containment under the provisions of 0PSP03-XC-0002A, Containment Entry and Partial Inspection (Containment Integrity Established).

Subsequently:

- A High Alarm is initiated on RT-8012, RCB Purge Exhaust.
- An Alert Alarm is initiated on RT-8013, RCB Purge Exhaust.
- All automatic actions are verified complete.

From the list below, what are TWO actions the Control Room Crew will perform in accordance with 0POP04-RA-0001, Radiation Monitoring System Alarm Response?

1. Confirm RT-8012 and RT-8013 readings by having Chemistry and/or Health Physics obtain Containment grab samples and monitor for an upward trend.
2. Verify RT-8011, RCB Atmosphere Rad Monitor, is in service and monitor for an upward trend.
3. Contact the Work Start Desk to notify the maintenance Team Leader, via the supplied electronic pager, to have the maintenance team evacuate Containment.
4. Sound the Containment Evacuation Alarm followed by a Public Address announcement to evacuate Containment.

A. 1 and 3

B. 2 and 3

C. 2 and 4

D. 1 and 4

Answer: D 1 and 4

Exam Bank No.: 2258

K/A Catalog Number: 073 G2.1.14 **Tier:** 2 **Group/Category:** 1

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

Process Radiation Monitoring:
Knowledge of criteria or conditions that require plant-wide announcements, such as pump starts, reactor trips, mode changes, etc.

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: 0POP04-RA-0001, Radiation Monitoring system Alarm Response, and 0PSP03-XC-0002A, Containment Entry and Partial Inspection (Containment Integrity Established)

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because personnel entering Containment under the provisions of 0PSP03-XC-0002A are supplied a communication device, however, the device is a two way radio which would provide for more direct communication than an electronic pager which is not used for the purpose of Containment communications.

B: INCORRECT: This distractor is credible because RT-8011 does monitor Containment Atmoshere but the sample flow to the monitor is automatically isolated if a High Alarm is received on RT-8012 or RT-8013. Also, personnel entering Containment under the provisions of 0PSP03-XC-0002A are supplied a communication device, however, the device is a two way radio which would provide for more direct communication than an electronic pager which is not used for the purpose of Containment communications.

C: INCORRECT:This distractor is credible because RT-8011 does monitor Containment Atmoshere but the sample flow to the monitor is automatically isolated if a High Alarm is received on RT-8012 or RT-8013.

D: CORRECT: Chemistry and/or HP would have to obtain grab samples to confirm high readings on RT-8012 and RT-8013 because RT-8011 would lose sample flow on a High alarm on either RT-8012 or RT-8013. This condition would procedurally require a Containment evacuation followed by a Plant Announcement to evacuate Containment. Even in 0PSP03-XC-0002A sounding the Containment evacuation alarm is the primary means of getting personnel out of containment followed by the PA announcement. Using the supplied radio is an alternate method.

Question Level: F **Question Difficulty** 3

Justification:

The student must have fundamental knowledge of conditions that would require a plant page and knowledge of the off-normal procedure for Radiation Monitors.

Exam Bank No.: 2259 **Last used on an NRC exam:** Never

RO Sequence Number: 58

When transferring Class 1E 125VDC battery chargers in accordance with 0POP02-EE-0001, ESF (Class 1E) DC Distribution System, which of the following identifies:

1. The correct order of breaker operation when ENERGIZING a charger
2. The required sequence for transferring chargers

	CORRECT ORDER OF BREAKER OPERATION	REQUIRED SEQUENCE
A.	Close the DC output, then the AC input	Remove the in-service charger from service, then place the standby charger in service
B.	Close the AC input, then the DC output	Place the standby charger in service, then remove the other charger from service
C.	Close the DC output, then the AC input	Place the standby charger in service, then remove the other charger from service
D.	Close the AC input, then the DC output	Remove the in-service charger from service, then place the standby charger in service

Answer: C Close the DC output, then the AC input; Place the standby charger in service, then remove the other charger from service

Exam Bank No.: 2259

K/A Catalog Number: 063 K4.01 **Tier:** 2 **Group/Category:** 1

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

Knowledge of DC electrical system design feature(s) and/or interlock(s) which provide for the following: Manual/automatic transfers of control

STP Lesson: LOT 201.37 **Objective Number:** 92047

STATE how the Class 1E 125 VDC System interfaces with other systems.

Reference: 0POP02-EE-0001 section 5.2

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: Plausible because there is a procedural allowance of 15 minutes with no charger connected before additional actions must be taken to return the battery to an operable status (this is how operation of our old style chargers was handled).

B: INCORRECT: Breaker operation is plausible because this is the normal lowpath for current when the charger is in service.

C: CORRECT: The DC breaker is closed first. These chargers are alllowed to be paralleled for up to 15 minutes.

D: INCORRECT: Breaker operation is plausible because this is the normal lowpath for current when the charger is in service. Charger sequence is plausible because there is a procedural allowance of 15 minutes with no charger connected before additional actions must be taken to return the battery to an operable status (this is how operation of our old style chargers was handled).

Question Level: F **Question Difficulty** 3

Justification:

Knowledge of system design and operation is required

Exam Bank No.: 2260 **Last used on an NRC exam:** Never

RO Sequence Number: 59

Given the following:

- Unit 1 is in Mode 5.
- A loss of all Instrument Air Compressors has occurred.
- Instrument Air pressure has trended down slowly to 98 psig.
- Maintenance reports that Instrument Air Compressor #14 is ready to be started.

Which of the following indicates where Instrument Air Compressor #14 can be operated/monitored from AND the current status of IA-PV-8568, Instrument Air to Yard Isolation?

	LOCATION WHERE CONTROLLED/MONITORED	**IA-PV-8568 STATUS**
A.	Locally at the compressor or in the basement Operator's station	CLOSED
B.	Locally at the compressor ONLY	CLOSED
C.	Locally at the compressor or in the basement Operator's station	OPEN
D.	Locally at the compressor ONLY	OPEN

Answer: D Locally at the compressor ONLY; OPEN

Exam Bank No.: 2260

K/A Catalog Number: APE 065 AA1.04 **Tier:** 1 **Group/Category:** 1

RO Importance: 3.5 **10CFR Reference:** 55.41(b)(4)

Ability to operate and / or monitor the following as they apply to the Loss of Instrument Air: Emergency air compressor

STP Lesson: LOT 202.26 **Objective Number:** 80556

Describe the instruments and controls available to operate and monitor the Instrument Air and Service Air system.

Reference: POP04-IA-0001 page 2, LOT202.26 handout page 1

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: Location is plausible because the other 3 compressors can be operated/monitored at both locations. Valve status is plausible because this would be correct if IA pressure was a few pounds lower.

B: INCORRECT: Valve status is plausible because this would be correct if IA pressure was a few pounds lower.

C: INCORRECT: Location is plausible because the other 3 compressors can be operated/monitored at both locations.

D: CORRECT: IA #14 (emergency compressor) can only be operated/monitored at the compressor itself. The IA to yard valve auto closes at 90 psig, so it will still be open under these conditions.

Question Level: F **Question Difficulty** 2

Justification:

Applicant must have knowledge of system design and operation.

Exam Bank No.: 2265 **Last used on an NRC exam:** Never

RO Sequence Number: 60

Which of the following provide an input into the control scheme for the Low Power Feedwater Regulating Valves (LPFRVs)?

1. Steam Generator level
2. Feedwater flow
3. Steam Flow
4. Power Range Nuclear Instruments
5. Steam/Feed Header ΔP

A. 1, 4, 5 ONLY

B. 1, 2, 3 ONLY

C. 1, 2, 3, 5 ONLY

D. 1, 4 ONLY

Answer: D 1, 4 ONLY

Exam Bank No.: 2265

K/A Catalog Number: 016 K4.03 **Tier:** 2 **Group/Category:** 2

RO Importance: 2.8 **10CFR Reference:** 55.41(b)(7)

Knowledge of NNIS design feature(s) and/or interlock(s) which provide for the following: Input to control systems

STP Lesson: LOT 201.15 **Objective Number:** 21005

IDENTIFY the level controller, the manual/auto station, all input signals to and all output signals from the SGWLCS. STATE how a change in each input signal will affect the position of the Main Feed Regulating Valves

Reference: LOT201.15 PowerPoint slide #20

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: Plausible because this delta-P is used for feedpump control when using either the main or low power valves

B: INCORRECT: Plausible because these flow signals are used for the main FRVs

C: INCORRECT: Plausible because these flow signals are used for the main FRVs/MFPs

D: CORRECT: actual level and PR Nis feed the circuit

Question Level: F **Question Difficulty** 3

Justification:

Applicant must have knowledge of instrumentation feeding the control circuit for the LPFRVs

Exam Bank No.: 2266 **Last used on an NRC exam:** Never

RO Sequence Number: 61

Unit 2 is in Mode 5 and preparing to shut down all of the Circulating Water (CW) System for maintenance.

A release of Waste Monitor Tank (WMT) 2C is currently in progress with 3 CW Pumps in operation.

Which of the following describes where the liquid radwaste release will be secured and the EARLIEST time that all CW Pumps can be stopped if the liquid radwaste release is secured at 1400 hours?

	Where Liquid Radwaste will be Secured	**EARLIEST time to Stop All CW Pumps**
A.	Remotely in the Main Control Room at CP-022.	1530 hours
B.	Locally at the Mechanical Auxiliary Building Control Panel.	1400 hours
C.	Remotely in the Main Control Room at CP-022.	1400 hours
D.	Locally at the Mechanical Auxiliary Building Control Panel.	1530 hours

Answer: D Locally at the Mechanical Auxiliary Building Control Panel. - 1530 hours

Exam Bank No.: 2266

K/A Catalog Number: 068 G2.3.11 **Tier:** 2 **Group/Category:** 2

RO Importance: 3.8 **10CFR Reference:** 55.41(b)(12)

Liquid Radwaste,
Ability to control radiation releases.

STP Lesson: LOT 202.22 **Objective Number:** 23901

DISCUSS the proper use of the circulating water system operating procedure for normal and abnormal operating conditions. Include the system operating parameters to be observed at different power levels.

Reference: 0POP02-CW-0001, Circulating Water System Pump Operation, Notes and Precautions 4.21 & 4.22

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because a gaseous radwaste release can be controlled from CP-018 in the Control Room (Normal and Supplemental Purge) but not any liquid radwaste releases which are controlled locally from the LWPS Control panel in the MAB.

B: INCORRECT: This distractor is credible because the time listed would be correct if CW Pump configuration was being reduced and not fully secured.

C: INCORRECT: This distractor is credible because a gaseous radwaste release can be controlled from CP-018 in the Control Room (Normal and Supplemental Purge) but not any liquid radwaste releases which are controlled locally from the LWPS Control panel in the MAB. Also, the time listed would be correct if CW Pump configuration was being reduced and not fully secured.

D: CORRECT: The liquid radwaste release is controlled form the LWPS control panel in the MAB and the CW procedure requires that CW remain in service for a minimum of 1.5 hours after a liquid radwaste release is secured in oder to prevent contamination of the CW system.

Question Level: F **Question Difficulty** 2

Justification:

The student must have fundamental of controls for the liquid radwaste system and procedural knowledge of how liquid radwaste and CW system interface.

Exam Bank No.: 2270 **Last used on an NRC exam:** Never

RO Sequence Number: 62

Unit 1 is at 90% power with all systems in a normal lineup. The Main Generator is supplying a total of 1255 MWE.

Subsequently:

- An EHC malfunction causes a load rejection.
- 2 minutes after the malfunction, Main Generator output is 1060 MWE and Tavg is 4°F above Tref.

At this time (2 minutes after the malfunction), which of the following identifies the status of the Steam Dump system AND current total steam flow?

	STEAM DUMP STATUS	TOTAL STEAM FLOW
A.	NOT armed, valves closed	LESS than 90% value
B.	ARMED with valves closed	LESS than 90% value
C.	ARMED with valves open	LESS than 90% value
D.	ARMED with valves open	Approximately EQUAL to 90% value

Answer: C ARMED with valves open; LESS than 90% value

Exam Bank No.: 2270

K/A Catalog Number: 041 A3.03 **Tier:** 2 **Group/Category:** 2

RO Importance: 2.7 **10CFR Reference:** 55.41(b)(8)

Ability to monitor automatic operation of the SDS, including:
Steam flow.

STP Lesson: LOT 202.09 **Objective Number:** 93002

Given plant conditions, DETERMINE their effects on the Steam Dump System.

Reference: LOT 202.09 Lesson Plan PPT Slides 12, 73 and 74

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible if the applicant mis-calculates the power reduction and believes dump valves were not armed.

B: INCORRECT: This distractor is credible if the applicant believes the Tave/Tref difference is not enough to open the valves (must be a greater than 3 degree difference to open valves).

C: CORRECT: In the given condition a C-7 would arm the steam dumps and with Tavg 4 degrees F above Tref, dump valves will be open. With the action of auto control rods, power and steam flow will be less than 90%. NOTE: The MWE reduction represents a reduction at about 7%/minute which would arm the C-7 controller for the Steam Dumps.

D: INCORRECT: This distractor is credible if control rods are not taken into consideration.

Question Level: H **Question Difficulty** 3

Justification:

The student must be able to predict the response of the Steam Dump System with the given conditions.

Exam Bank No.: 2365 **Last used on an NRC exam:** Never

RO Sequence Number: 63

In accordance with 0POP01-ZA-0018, Emergency Operating Procedure User's Guide, when implementing an Emergency Operating Procedure and a conflict does NOT exist ...

A. Off Normal procedure actions SHOULD be implemented IF adequate resources are available and Technical Specification requirements CONTINUE to apply.

B. Off Normal procedure actions SHALL be implemented and Technical Specification requirements CONTINUE to apply.

C. Off Normal procedure actions SHOULD be implemented IF adequate resources are available and Technical Specification requirements DO NOT apply.

D. Off Normal procedure actions SHALL be implemented and Technical Specification requirements DO NOT apply.

Answer: A Off Normal procedure actions SHOULD be implemented IF adequate resources are available and Technical Specification requirements CONTINUE to apply.

Exam Bank No.: 2365

K/A Catalog Number: G2.4.8 **Tier:** 3 **Group/Category:**

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

Knowledge of how abnormal operating procedures are used in conjunction with EOPs.

STP Lesson: LOT 504.04 **Objective Number:** 92283

Given a set of conditions and the occurrence of a Red, Orange, or Yellow path CSF, STATE the action required per 0POP01-ZA-0018, EOP Users Guide.

Reference: LOT 504.04 Lesson on Intro to Emergency Procedures and 0POP01-ZA-0018, Emergency Operating Procedure User's Guide

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: CORRECT: Per 0POP01-ZA-0018, Emergency Operating Procedure User's Guide, off-normal procedures should be used but only if a conflict does not exist with the EOP and adequate resources are available. In EOPs TS requirements apply.

B: INCORRECT: This distractor is credible because stating that the operating crew SHALL use an off-normal procedure if no conflicts exist with the EOP may seam logical but the crew still has a choice not to use an off-normal procedure if adequate resources are not available.

C: INCORRECT: This distractor is credible because in some emergency procedure like those to support events that are outside the design basis will allow performing actions that are outside the requirements of TSs.

D: INCORRECT: This distractor is credible because stating that the operating crew SHALL use an off-normal procedure if no conflicts exist with the EOP may seam logical but the crew still has a choice not to use an off-normal procedure if adequate resources are not available. Also, some emergency procedure like those to support events that are outside the design basis will allow performing actions that are outside the requirements of TSs.

Question Level: F **Question Difficulty** 3

Justification:

The student must have knowledge of 0POP01-ZA-0018, Emergency Operating Procedure User's Guide.

Exam Bank No.: 2275 **Last used on an NRC exam:** Never

RO Sequence Number: 64

Given the following:

- Unit 1 is in Mode 3
- No Centrifugal Charging Pumps (CCPs) are available
- The Positive Displacement Charging Pump (PDP) has been started
- The Unit Supervisor directs you to place Excess Letdown in service

Which of the following indicates how many valves must be opened to establish Excess Letdown flow AND the location where Excess Letdown flow is INITIALLY aligned to:

	VALVES THAT MUST BE OPENED	**FLOW INITIALLY ALIGNED TO:**
A.	1 Isolation valve, 1 flow control valve	RCDT
B.	2 Isolation valves, 1 flow control valve	RCDT
C.	1 Isolation valve, 1 flow control valve	PRT
D.	2 Isolation valves, 1 flow control valve	PRT

Answer: B 2 Isolation valves, 1 flow control valve; RCDT

Exam Bank No.: 2275

K/A Catalog Number: APE 022 AA1.07 **Tier:** 1 **Group/Category:** 1

RO Importance: 2.8 **10CFR Reference:** 55.41(b)(7)

Ability to operate and / or monitor the following as they apply to the Loss of Reactor Coolant Makeup: Excess letdown containment isolation valve switches and indicators

STP Lesson: LOT 201.06 **Objective Number:** 48241

DESCRIBE the CVCS System flowpaths to include: 5. Excess Letdown

Reference: LOT201.06 PowerPoint slide #16

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: Plausible because 1 isolation valve would normally be sufficient for other system designs.

B: CORRECT: There are 2 isolation valves. Flow is initially purged to the RCDT.

C: INCORRECT: Plausible because 1 isolation valve would normally be sufficient for other system designs and the PRT is another tank in the RCB that could receive this fluid (flow is initially directed to a different location to flush any water of different boron concentration).

D: INCORRECT: Plausible because the PRT is another tank in the RCB that could receive this fluid (flow is initially directed to a different location to flush any water of different boron concentration).

Question Level: F **Question Difficulty** 3

Justification:

Knowledge of excess letdown design/operation needed to answer this question

Exam Bank No.: 2367

Last used on an NRC exam: Never

RO Sequence Number: 65

Which of the following describes Reactor Coolant Pump design seal injection flow and the design feature that ensures seal function if normal seal injection is lost?

	Design Seal Injection Flow	Design Feature that Ensures Seal Function
A.	5 GPM	A thermal barrier heat exchanger cools water from the RCS.
B.	8 GPM	A thermal barrier heat exchanger cools water from the RCS.
C.	5 GPM	The number 1 seal leakoff is isolated and the number 2 seal converts to a film-riding seal.
D.	8 GPM	The number 1 seal leakoff is isolated and the number 2 seal converts to a film-riding seal.

Answer: B 8 GPM - A thermal barrier heat exchanger cools water from the RCS.

Exam Bank No.: 2367

K/A Catalog Number: 003 K4.04 **Tier:** 2 **Group/Category:** 1

RO Importance: 2.8 **10CFR Reference:** 55.41(b)(7)

Knowledge of RCPS design feature(s) and/or interlock(s) which provide for the following:
Adequate cooling of RCP motor and seals.

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 Lesson Plan Handout on Reactor Coolant Pumps.

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because 5 gpm is part of the design seal injection flow but it is a part of the total flow from CVCS that flows past the thermal barrier and into the RCS. If seal injection flow were 5 gpm then a seal injecton flow low alarm would annunciate.

B: CORRECT: The design seal injection flow from CVCS to the RCP seal is 8 gpm and the thermal barrier heat exchanger acts as a backup in the event of a loss of seal injection flow by cooling the water from the RCS that would be flowing in reverse direction through the thermal barrier and into the seal package.

C: INCORRECT: This distractor is credible because 5 gpm is part of the design seal injection flow but it is a part of the total flow from CVCS that flows past the thermal barrier and into the RCS. If seal injection flow were 5 gpm then a seal injecton flow low alarm would annunciate. Also, the number 2 seal converting to a film-riding seal is a design feature of the RCP seal package but it is for a failure of the number 1 seal.

D: INCORRECT: This distractor is credible because the number 2 seal converting to a film-riding seal is a design feature of the RCP seal package but it is for a failure of the number 1 seal.

Question Level: F **Question Difficulty** 3

Justification:

The student must have knowledge of RCP design including the RCP seal package.

Exam Bank No.: 2368 **Last used on an NRC exam:** Never

RO Sequence Number: 66

An ECO has been hung on a Technical Specification required piece of equipment to allow for maintenance activities.

As a result of this, which of the following is required in accordance with 0POP01-ZQ-0022, Plant Operations Shift Routines?

A. - Make an entry in the Control Room Logbook AND Operability Assessment System log;
- Add the LCO to the Shift Turnover Checklist

B. - Make an entry in the Control Room Logbook AND Operability Assessment System log;
- Update the Safety Function Checklist completed at the beginning of shift

C. - Make an entry in the Control Room Logbook OR Operability Assessment System log;
- Add the LCO to the Shift Turnover Checklist

D. - Make an entry in the Control Room Logbook OR Operability Assessment System log;
- Update the Safety Function Checklist completed at the beginning of shift

Answer: A -Make an entry in the Control Room Logbook AND Operability Assessment System log;
- Add the LCO to the Shift Turnover Checklist

Exam Bank No.: 2368

K/A Catalog Number: G2.2.36 **Tier:** 3 **Group/Category:**

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

Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations

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: 0POP01-ZQ-0022 steps 3.4.1.7 and 6.4.2.2

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: CORRECT: Per the referenced procedure, in this situation the CR log, OAS log and turnover checklist must be updated to alllow tracking the activity

B: INCORRECT: Plausible because the Safety Function Checklist is used to verify the appropriate equipment is available, but it is only performed once per shift (at the beginning) and not updated.

C: INCORRECT: Plausible because both methods are used for tracking and are somewhat redundant, however both are required.

D: INCORRECT: Plausible because both methods are used for tracking and are somewhat redundant, however both are required and the Safety Function Checklist is used to verify the appropriate equipment is available, but it is only performed once per shift (at the beginning) and not updated.

Question Level: H **Question Difficulty** 3

Justification:

The applicant must apply procedural requirements to the given situation.

Exam Bank No.: 2278 **Last used on an NRC exam:** Never

RO Sequence Number: 67

Unit 1 is in Mode 3 with the following plant conditions:

- Tave is 565°F
- 3 Circulating Water Pumps are running
- Condenser pressure is 21 inches Hg Vacuum
- Steam Dumps are in the Steam Pressure Mode with 25% demand signal on the UI-0555 Demand Indicator
- All Steam Dump Valves indicate closed

Which of the following indicates the signal preventing the Steam Dump Valves from opening and the basis for the valves not opening?

	SIGNAL	BASIS
A.	P-12 IS present	The Condenser is NOT available to receive Steam Dump flow
B.	P-12 IS present	An overcooling event may be occurring
C.	C-9 is NOT present	The Condenser is NOT available to receive Steam Dump flow
D.	C-9 is NOT present	An overcooling event may be occurring

Answer: C C-9 is NOT present; The Condenser is NOT available to receive Steam Dump flow

Exam Bank No.: 2278

K/A Catalog Number: APE 051 AK3.01 **Tier:** 1 **Group/Category:** 2

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

Knowledge of the reasons for the following responses as they apply to the Loss of Condenser Vacuum: Loss of steam dump capability upon loss of condenser vacuum

STP Lesson: LOT 202.09 **Objective Number:** 81472

LIST the signals associated with the Steam Dumps including setpoints, coincidence, logic, and interlocks

Reference: LOT202.09 PowerPoint slides 99 & 106, DBD 5Z529ZB1003 page 3-154

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: Plausible because P-12 is a signal that will close all steam dump valves (to prevent overcooling)

B: INCORRECT: Plausible because P-12 is a signal that will close all steam dump valves (to prevent overcooling)

C: CORRECT: Indicated condenser pressure is below the setpoint for which it is considered available to receive flow from steam dumps.

D: INCORRECT: Plausible because the given basis is for P-12 which also will prevent the valves from opening.

Question Level: F **Question Difficulty** 3

Justification:

The applicant requires knowledge of Steam Dump control and the basis behind it's design.

Exam Bank No.: 2279 **Last used on an NRC exam:** Never

RO Sequence Number: 68

Given the following:

- Unit 1 is operating at 100% power
- Charging flow indication is 110 gpm with the controller in MANUAL
- Letdown flow indication is 120 gpm
- Reactor Coolant Pump Seal Injection flow indicates 8 gpm per pump

Based on these indications, which of the following identifies the current trend in Pressurizer level AND the time it will take for Pressurizer level to change by 2%?

	TREND	TIME FOR 2% CHANGE
A.	RISING	~14 minutes
B.	RISING	~3 minutes
C.	LOWERING	~14 minutes
D.	LOWERING	~3 minutes

Answer: A RISING; ~14 minutes

Exam Bank No.: 2279

K/A Catalog Number: 011 K5.05 **Tier:** 2 **Group/Category:** 2

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

Knowledge of the operational implications of the following concepts as they apply to the PZR LCS: Interrelation of indicated charging flow rate with volume of water required to bring PZR level back to programmed level hot/cold

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

Given CVCS flows, ESTIMATE the RCS leakage rate.

Reference: LOT201.06 PowerPoint slide #75

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: CORRECT: Based of the given flows and taking into account RCP seal leakoff (12 gpm total), 10 gpm more is going into the RCS than coming out. Based on 68 gal/% in the PZR, it will take ~14 minutes for a 2% change.

B: INCORRECT: Plausible because the time is based on a calculation omitting RCP seal leakoff (which is not given in the stem)

C: INCORRECT: Plausible because the trend given represents what would be calculated if seal injection/leakoff is not considered or if it was not understood what the relationship between seal injection and leakoff is.

D: INCORRECT: Plausible because the trend given represents what would be calculated if seal injection/leakoff is not considered or if it was not understood what the relationship between seal injection and leakoff is.

Question Level: H **Question Difficulty** 3

Justification:

Applicant must have knowledge of overall plant operation regarding the flow balance between the RCS and CVCS systems and be able to correctly calculate the effects of an imbalance in flows.

Exam Bank No.: 2280 **Last used on an NRC exam:** Never

RO Sequence Number: 69

Given the following:

- Unit 1 is operating at 45% power
- RCP 1B Seal leakoff flow indication pegs high and Number 1 seal ΔP drops to 200 psid
- The crew enters 0POP04-RC-0002, Reactor Coolant Pump Off Normal, which directs the following actions in the given sequence:
    - Manually trip the Reactor
    - Ensure the Main Turbine Tripped
    - Stop the affected RCP
    - Close the affected RCP's Number 1 seal leakoff valve within 3-5 minutes of stopping the pump

Which of the following provides the basis for performing the indicated actions?

	Manually trip the Reactor before securing the pump	**Closing the Number 1 Seal leakoff valve 3-5 minutes after stopping the pump**
A.	Removes the heat source from the RCS since power is <P-9 and an automatic trip will not occur.	Ensures the RCP shaft is still SLOWLY rotating to help the Number 2 Seal become a film-riding seal (from a face-rubbing seal).
B.	Removes the heat source from the RCS since power is <P-9 and an automatic trip will not occur.	Ensures the RCP shaft has STOPPED rotating to minimize damage to the Number 2 seal.
C.	Prevents an unnecessary challenge to the Reactor Protection System.	Ensures the RCP shaft is still SLOWLY rotating to help the Number 2 Seal become a film-riding seal (from a face-rubbing seal).
D.	Prevents an unnecessary challenge to the Reactor Protection System.	Ensures the RCP shaft has STOPPED rotating to minimize damage to the Number 2 seal.

Answer: D Prevents an unnecessary challenge to the Reactor Protection System.; Ensures the RCP shaft has STOPPED rotating to minimize damage to the Number 2 seal.

Exam Bank No.: 2280

K/A Catalog Number: APE 015 AK3.03 **Tier:** 1 **Group/Category:** 1

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

Knowledge of the reasons for the following responses as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): Sequence of events for manually tripping reactor and RCP as a result of an RCP malfunction

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: 0POP02-RC-0002 basis for step 1 (page 44)

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: Tripping the reactor is plausible because power is less than P-9 and a common error is to confuse P-8 (Rx trip on low flow @40% power) and P-9 (Turbine trip from Reactor trip @50% power). Closing the seal leakoff is plausible because the Number 2 seal does transform from a face rubbinbg to film riding seal when the Number 1 seal fails and the leakoff valve is closed. However having the shaft rotating is not necessary or desired.

B: INCORRECT: Tripping the reactor is plausible because power is less than P-9 and a common error is to confuse P-8 (Rx trip on low flow @40% power) and P-9 (Turbine trip from Reactor trip @50% power).

C: INCORRECT: Closing the seal leakoff is plausible because the Number 2 seal does transform from a face rubbinbg to film riding seal when the Number 1 seal fails and the leakoff valve is closed. However having the shaft rotating is not necessary or desired.

D: CORRECT: An auto trip should occur, but we try not to challenge the safety system. Waiting 3 minutes ensures the shaft has stopped rotating.

Question Level: H **Question Difficulty** 3

Justification:

The applicant must analyze the give conditions and then apply them to the procedure and their knowledge of of plant design to formulate the correct response.

Exam Bank No.: 2281 **Last used on an NRC exam:** Never

RO Sequence Number: 70

Unit 1 was at 100% power with all systems in a normal lineup.

Essential Cooling Water (ECW) Pumps 1A and 1B are running. ECW Pump 1C is in Auto.

Subsequently:

- A Loss of Offsite Power (LOOP) occurs on Class 1E 4.16 KV Bus E1C
- Emergency Diesel Generator #13 starts and supplies power to Class 1E 4.16 KV Bus E1C
- ECW Pump 1C started but the discharge valve stopped at 50% open due to mechanical binding.

Which of the following describes the final condition of ECW Pump 1C and the reason why?

ECW Pump 1C…

A. remains running to continue cooling the Train C CCW supplementary cooler.

B. trips to protect pump since the pump does not have a recirc line.

C. remains running to continue cooling to the 11C RCB chiller.

D. trips to protect pump shaft bearings from overheating.

Answer: B trips to protect pump since the pump does not have a recirc line.

Exam Bank No.: 2281

K/A Catalog Number: APE 062 AK3.02 **Tier:** 1 **Group/Category:** 1

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

Knowledge of the reason for the following responses as they apply to the Loss of Nuclear Service Water: The automatic actions (alignments) within the nuclear service water resulting from the actuation of the ESFAS.

STP Lesson: LOT 201.13 **Objective Number:** 91193

LIST all automatic functions, switch locations, switch positions, annunciators, local/remote functions, interlocks and permissive for the following: A) Traveling Screens, B) Screen Wash Booster Pump, C) Screen Wash Valve, D) Strainers, E) Pumps and Motors, F) Discharge Valve, G) Sump, H) Blowdown Valve, I) Sump Pump and Motor.

Reference: LOT 201.13 Lesson PPT 42 and the student handout.

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because if an SI actuation was present then SI will block the trip of an ECW pump from discharge valve position even though a partial loss of the system flow may occur. The cooler is supplied by ECW to protect the CCW pump motor.

B: CORRECT: The ECW pumps do not have a recirc line dedicated for low flow conditions and therefore the logic to trip the pump is built in if the discharge valve does not open fully (95%) within 25 seconds unless an SI is present.

C: INCORRECT: This distractor is credible because if an SI actuation was present then SI will block the trip of an ECW pump from discharge valve position even though a partial loss of the system flow may occur. The RCFCs are cooled by RCB chilled water normally, but RCB chilled water is isolated during a LOOP and also, the RCB Chiller condenser is cooled by OL-ACW not ECW.

D: INCORRECT: This distractor is credible because the pump bearings are cooled and lubricated by the flow of water coming up through the pump casing and a partially closed discharge valve will reduce this flow but not enough to effect the temperature of the pump bearings.

Question Level: F **Question Difficulty** 3

Justification:

Applicant must have fundamental knowledge of the reasons for ECW Pump logics.

Exam Bank No.: 2263 **Last used on an NRC exam:** Never

RO Sequence Number: 71

Given the following:

- The plant is operating at 100% power, steady state conditions
- A malfunction in the Rod Control System causes rods to begin stepping out at maximum rate

Which of the following identifies the immediate action to be taken in accordance with 0POP04-RS-0001, Rod Control Malfunction AND the initial effect the Rod Control malfunction had on charging flow rate?

	OPERATOR ACTION Place the ROD BANK SEL switch in the ..	CHARGING FLOW RATE ….
A.	CB D position	rises
B.	CB D position	lowers
C.	MAN position	rises
D.	MAN position	lowers

Answer: D MAN position; lowers

Exam Bank No.: 2263

K/A Catalog Number: 001 K3.01 **Tier:** 2 **Group/Category:** 2

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

Knowledge of the effect of a loss or malfunction of the CRDS will have on the following: CVCS

STP Lesson: LOT 201.14 **Objective Number:** 4460

STATE the interfaces between the pressurizer pressure and level control systems and the following: A. CVCS

Reference: LOT 201.14 PowerPoint Slide #29

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: Credible because this is the controlling bank of rods and performing the action will take them out of auto, but it is not in accordance with the procedure. Flow is credible if Pzr program level continued to rise with Tave.

B: INCORRECT: Credible because this is the controlling bank of rods and performing the action will take them out of auto, but it is not in accordance with the procedure.

C: INCORRECT: Flow is credible if Pzr program level continued to rise with Tave.

D: CORRECT: Tave will rise causing Pzr level to rise. Since program Pzr level is clipped at the 100% power value, actual level will be greater than program and charging flow will lower.

Question Level: H **Question Difficulty** 3

Justification:

The applicant must be able to determine the effect a continuaous rod withdrawl will have on pressurizer level and ultimately charging flow.

Exam Bank No.: 2264 **Last used on an NRC exam:** Never

RO Sequence Number: 72

Unit 1 is at 100% power with all systems in a normal lineup.

Deaerator (DA) level control has inadvertently shifted to manual.

Which TWO of the following describe automatic actions that would occur if DA Storage tank level were to rise up to 90% level?

1. Condensate Inlet Valves, CD-MOV-0574 and CD-MOV-0575, close
2. Main Feedwater Heater 11A & 11B Drain Valves to DA, FW-LV-7242 & FW-LV-7245, close
3. All Condensate Pumps Trip
4. All Moisture Separator Drain Tank (MSDT) Pumps Trip

A. 1 and 2

B. 2 and 3

C. 3 and 4

D. 1 and 4

Answer: A 1 and 2

Exam Bank No.: 2264

K/A Catalog Number: 056 K1.03 **Tier:** 2 **Group/Category:** 2

RO Importance: 2.6 **10CFR Reference:** 55.41(b)(7)

Knowledge of the physical connections and/or cause-effect relationships between the Condensate System and the following systems:
MFW

STP Lesson: LOT 202.13 **Objective Number:** 22359

LIST the automatic actions and/or trips associated with the pumps and valves in the feedwater system including the setpoint, if applicable, for each automatic action or trip.

Reference: LOT 201.13 Lesson Plan PPT Slide #25

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: CORRECT: At 90% level in the the DA the Condensate inlet valves and the High Pressure Feedwater Heater Drain valves close. Both of these flow paths feed the DA.

B: INCORRECT: This distractor is credible because Condensate pumps do feed the DA but they do not trip on a high level in the DA.

C: INCORRECT: This distrator is credible because the Condensate pumps and the MSDT pumps to feed the DA but neither set of pumps trip on a high level in the DA.

D: INCORRECT: This distractor is credible because MSDT pumps do feed the DA but they do not trip on a high level in the DA.

Question Level: F **Question Difficulty** 3

Justification:

The student must of fundamental knowledge of automatic actions that occur on a high level in the main feedwater deaerator storage tank.

Exam Bank No.: 2267 **Last used on an NRC exam:** Never

RO Sequence Number: 73

Given the following:

- Unit 1 is in Mode 4.
- The Containment Carbon Units are in service to clean up the containment atmosphere.
- The Filter Outlet Temperature HI and Subsequently the Filter Outlet Temperature HI HI alarms are received.

Which of the following describes the impact of the alarms AND the action necessary to correct the condition?

	IMPACT	ACTION
A.	The CARBON filter in the unit may become degraded/damaged.	Start the second fan for each filter unit.
B.	The CARBON filter in the unit may become degraded/damaged.	Initiate the filter unit deluge.
C.	The HEPA filter in the unit may become degraded/damaged.	Start the second fan for each filter unit.
D.	The HEPA filter in the unit may become degraded/damaged.	Initiate the filter unit deluge.

Answer: B The CARBON filter in the unit may become degraded/damaged; Initiate the filter unit deluge

Exam Bank No.: 2267

K/A Catalog Number: 027 A2.01 **Tier:** 2 **Group/Category:** 2

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

Ability to (a) predict the impacts of the following malfunctions or operations on the CIRS; and (b) based on those predictions, use Procedures to correct, control, or mitigate the consequences of those malfunctions or operations: High temperature in the filter system

STP Lesson: LOT 202.33 **Objective Number:** 35105

DESCRIBE the interfaces between the RCB-HVAC system and its' components and sub-systems (containment and reactor cavity cooling fans, coolers, and carbon units).

Reference: LOT202.33 PowerPoint slide #32

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: Plausible because one fan is normally running and starting a second fan will raise the airflow and therefore the cooling effect withing the unit.

B: CORRECT: The temperature detectors are on the outlet of the carbon filter and when a HI HI temperature is reached, the deluge should be initiated.

C: INCORRECT: Plausible because HEPA filters are also located within the filter housing and starting a second fan will raise the airflow and cooling effect.

D: INCORRECT: Plausible because HEPA filters are also located within the filter housing.

Question Level: F **Question Difficulty** 3

Justification:

Knowledge of filter unit design/operation needed to correctly respond.

Exam Bank No.: 2269 **Last used on an NRC exam:** Never

RO Sequence Number: 74

Given the following:

- Unit 2 is in Mode 1
- CNTMT PRESS HI/LO is in due to LOW pressure in Containment
- The Supplementary Containment Purge Supply and Return Valves were opened and one Purge Supply fan was started to raise Containment pressure.
- The CNTMT PRESS HI/LO alarm cleared, AND has just alarmed again.

Which of the following indicates where Containment pressure can be monitored AND the status of the Containment pressure Technical Specification?

	WHERE MONITORED	TECHNICAL SPECIFICATION STATUS
A.	ICS ONLY	Technical Specification for Containment pressure has been exceeded.
B.	ICS ONLY	Technical Specification for Containment pressure has NOT been exceeded.
C.	ICS or CP-002 Panel Meter	Technical Specification for Containment pressure has been exceeded.
D.	ICS or CP-002 Panel Meter	Technical Specification for Containment pressure has NOT been exceeded.

Answer: A ICS ONLY; Technical Specification for Containment pressure has been exceeded

Exam Bank No.: 2269

K/A Catalog Number: 029 A1.03 **Tier:** 2 **Group/Category:** 2

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

Ability to predict and/or monitor changes in parameters to prevent exceeding design limits) associated with operating the Containment Purge System controls including: Containment pressure, temperature, and humidity

STP Lesson: LOT 201.01 **Objective Number:** 91026

DESCRIBE the purpose of the following controls and instrumentation and their location(s) for monitoring and indications: A. RCB pressure

Reference: LOT201.01 PowerPoint slide #87, POP09-AN-02M2 page 3

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: CORRECT: Pressure can be monitored using ICS. This alarm indicates the TS has been exceeded.

B: INCORRECT: Plausible because an alarm usually indicated there is some margin to TS entry, but not in this case.

C: INCORRECT: Plausible because CP-002 has all other containment controls indications, but no pressure meter (the only board indication is a recorder on CP-018).

D: INCORRECT: Plausible because CP-002 has all other containment controls indications, but no pressure meter (the only board indication is a recorder on CP-018) and an alarm usually leaves some margin for TS entry.

Question Level: F **Question Difficulty** 3

Justification:

Applicant requires knowledge of control board indication and Technical Specification entry conditions

Exam Bank No.: 2271 **Last used on an NRC exam:** Never

RO Sequence Number: 75

Based ONLY on the information given, which TWO of the following statements are considered "Conservative Decisions and/or Practices' with regards to Reactivity Manipulations per the Conduct of Operations Manual?

1. The Unit Supervisor stays in the 'At the Controls Area' during a reactivity manipulation.
2. Control Rods are manually withdrawn to raise RCS temperature during an unplanned transient.
3. The Reactor Operator adds an additional amount of dilution water, above that identified in the shift briefing, to the RCS because the previous dilution did not produce the desired result.
4. PEER Checks are used for routine reactivity manipulations.

A. 1 and 2

B. 2 and 3

C. 3 and 4

D. 1 and 4

Answer: D 1 and 4

Exam Bank No.: 2271

K/A Catalog Number: G2.1.39 **Tier:** 3 **Group/Category:**

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

Conduct of Operations:
Knowledge of conservative decision making practices.

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: LOT 507.01 Admin Procedures - Conduct of Operations Manual Chapter 2

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified from**

Distractor Justification

A: INCORRECT: This distractor is credible because withdrawing control rods to raise temperature during an unplanned transient is acceptable but only if the control rods are in Auto or unless specifically directed by a plant procedure. The statement as written would not be a conservative practice.

B: INCORRECT: This distractor is credible because withdrawing control rods to raise temperature during an unplanned transient is acceptable but only if the control rods are in Auto or unless specifically directed by a plant procedure. The statement as written would not be a conservative practice. Also, the amount of dilution water directed to the RCS can be changed from that discussed in the shift brefing but only after discussion with the Unit Supervisor or Shift Manager. The statement as written would not be a conservative practice.

C: INCORRECT: This distractor is credible because the amount of dilution water directed to the RCS can be changed from that discussed in the shift brefing but only after discussion with the Unit Supervisor or Shift Manager. The statement as written would not be a conservative practice.

D: CORRECT: Having the US at in the controls area during a reactivity amnipulation and providing PEER Checks for routing reactiviy manipulations are both established Conservative Practices as defined in the Conduct of Operations Manual.

Question Level: F **Question Difficulty** 2

Justification:

The student must have knowledge of the established conservative decisions and practices defined in the Conduct of Operations Manual for Reactivity Manipulations.

Exam Bank No.: 186 **Last used on an NRC exam:** Never

SRO Sequence Number: 76

Which of the following is the basis for the Technical Specification 3.9.10 requirement that at least 23 feet of water be maintained over the top of the reactor vessel flange during movement of fuel assemblies that have been irradiated?

A. Ensure sufficient depth to remove 99% of the assumed Iodine gap activity from a ruptured fuel assembly.

B. Ensure a sufficient volume of borated water to maintain shutdown margin during a dilution accident.

C. Ensure the operating RHR pumps have sufficient Net Positive Suction Head.

D. Ensure that the Spent Fuel Pool Cooling pumps have sufficient Net Positive Suction Head.

Answer: A Ensure sufficient depth to remove 99% of the assumed Iodine gap activity from a ruptured fuel assembly.

Exam Bank No.: 186

K/A Catalog Number: G2.2.25 **Tier:** 3 **Group/Category:**

SRO Importance: 4.7 **10CFR Reference or SRO Objective:** 55.43(b)(2)

Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.

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 3.9.10 Basis

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified From**

Distractor Justification

A: CORRECT: Accurate per TS 3.9.10 bases

B: INCORRECT: Plausible because at first it seems logical that a large volume of borated water above the core would hinder a dilution, however the water in the RCS doe not mix with the water above the vessel in the cavity, so it does not matter in that regard.,

C: INCORRECT: Plausible because TS requires an RHR pump to be in operation with 3000 gpm of flow which required a minimum amount of head to prevent cavitiation.

D: INCORRECT: Plausible because during fuel movement, the RCS and SFP are tied together and level is controlled based on the cavity. A certain height of water in the cavity corresponds to a certain height of water in the SFP which provides NPSH for the SFP Pumps.

Question Level: F **Question Difficulty** 3

Justification:

The applicant requires knowledge of the tech spec bases

Exam Bank No.: 2185 **Last used on an NRC exam:** Never

SRO Sequence Number: 77

Unit 1 is in a Site Area Emergency based on the following:

- A Core Cooling Orange Path has been in effect for 20 minutes.
- Core Exit Thermocouples are 715ºF and slowly rising.
- RCS Plenum level is 20%.

Using the attached classification table, which of the following parameters would cause an escalation to a General Emergency?

NOTE: Consider each of the following separately.

A. Reactor Coolant System Activity (DEI) is reported at 350µCi/gm.

B. Reactor Coolant Failed Fuel Monitor, RT-8039, is reading 900µCi/ml.

C. Containment Pressure is 25psig.

D. Containment Hatch Monitor is reading 200mR/hr.

Answer: A Reactor Coolant System Activity (DEI) is reported at 350µCi/gm.

Exam Bank No.: 2185

K/A Catalog Number: G2.4.41 **Tier:** **Group/Category:**

SRO Importance: 4.6 **10CFR Reference or SRO Objective:** 55.43(b)(5)

Knowledge of the emergency action level thresholds and classifications.

STP Lesson: LOT 803.14 **Objective Number:** 74026

Given an emergency condition and a copy of the emergency classification tables from 0ERP01-ZV-IN01, Emergency Classification, CLASSIFY the emergency condition.

Reference: LOT 803.14 - 0ERP01-ZV-IN01, Emergency Classification

Attached Reference ☑ **Attachment:** 0ERP01-ZV-IN01, Emergency Classification, Addendum 1, Emergency Classification Tables, Page 2 and 3.

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified From**

Distractor Justification

A: CORRECT: With the given conditions the Fission Product Barrier Degradation totals 8 points. 3 points for potential loss of fuel clad due to Core Cooling Orange Path or RCS Plenum level at 20% or CETs at 715 degrees F. 4 points for loss of RCS due to Core Cooling Yellow with subcooling less than 0 degrees F. (Core Cooling Orange and CETs at 715 degrees F would satisfy this) 1 point for potential loss of Containment due to Core Cooling Orange greater than 15 minutes. With RCS DEI at 350 uCi/gm fuel clad would go from potential loss to loss. (3 points to 4 points) This would make the Fission Product Barrier total 9 points and thus raise the E-Plan declaration to a General Emergency.

B: INCORRECT: This is a credible distractor because although the failed fuel monitor reading of 900uCi/ml is greater than the limit of 870uCi/ml this represents on a potential loss of the fuel clad which has already been identified.

C: INCORRECT: This is a credible distractor because athough Containment pressure of 25 psig is considerably high, Containment pressure alone could not cause an escalation to a GE because it would only represent a potential loss of Containment which has already been identified.

D: INCORRECT: This is a credible distractor because although an elevated reading on the Containment Hatch Rad Monitor could cause an escalation in the E-Plan classification the reading would have to go above 222mR/hr.

Question Level: H **Question Difficulty** 3

Justification:

The SRO has to evaluate the condition given and determine which parameter would cause an escalation of emergency classification level to a GE.

Exam Bank No.: 661 **Last used on an NRC exam:** 2003

SRO Sequence Number: 78

Given the following:

- A LOCA with core damage has occurred on Unit 1 and a SAE has just been declared. The TSC and EOF have been activated.
- To minimize core damage it is recommended that entry be made into the containment penetration space to locally restore Component Cooling Water Flow to an RHR heat exchanger.
- Projected dose rate in the area is 1.16E+5 mR/hr.
- Duration of the exposure is expected to be 3 minutes.

Who must authorize this exposure?

A. Radiological Director

B. Emergency Director

C. Plant General Manager

D. STPNOC Vice President

Answer: B Emergency Director

Exam Bank No.: 661

K/A Catalog Number: APE 062 G2.3.4 **Tier:** 1 **Group/Category:** 1

SRO Importance: 3.7 **10CFR Reference or SRO Objective:** 55.43(b)(4)

Loss of Nuclear Service Water: Knowledge of radiation exposure limits under normal or emergency conditions.

STP Lesson: EPT 001.00 **Objective Number:**

Describe the non-delegable responsibilities of the Emergency Director

Reference: 0ERP01-ZV-IN06; 0PGP03-ZR-0050

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified From**

Distractor Justification

A: Incorrect - Plausible because the Radiological Director is responsible for authorizing exposures above 2 Rem but less than 5 Rem when responding to EMERGENCY conditions.

B: Correct - Emergency Director is responsible for authorizing exposures above 5 Rem when responding to EMERGENCY conditions. With a projected dose rate of 1.16E+5 mR/hr the total dose to respond to this emergency condition is 5.8 Rem (1.16E+5 mR/hr / 60minutes x 3 minutes = 5.8 R)

C: Incorrect - Plausible because the Plant General Manager is responsible for authorizing exposures in excess of 2 Rem at STP or 3 Rem Total during NORMAL operating conditions

D: Incorrect - Plausible because the STPNOC Vice President is responsible for authorizing exposures in excess of 2 Rem at STP or 4 Rem Total during NORMAL operating conditions.

Question Level: H **Question Difficulty** 3

Justification:

The applicant must accurately determine the projected dose and then use that knowledge to determine the approval authority based on the applicable exposure limits for each position.

Exam Bank No.: 2336 **Last used on an NRC exam:** Never

SRO Sequence Number: 79

Alarm 'CNTMT PRESS HI/LO' annunciates on CP-002 due to the Operating Crew swapping Reactor Containment Fan Coolers (RCFCs).

Which of the following indicated containment pressures caused the alarm to annunciate and which Technical Specification Action should the Unit Supervisor enter?

	Containment Pressure	Technical Specification Action
A.	0.2 psig	Restore Containment pressure within 8 hour or be in HOT STANBY within the next 6 hours.
B.	0.2 psig	Restore Containment pressure within 1 hour or be in HOT STANBY within the next 6 hours.
C.	- 0.2 psig	Restore Containment pressure within 8 hour or be in HOT STANBY within the next 6 hours.
D.	- 0.2 psig	Restore Containment pressure within 1 hour or be in HOT STANBY within the next 6 hours.

Answer: D - 0.2 psig - Restore Containment pressure within 1 hour or be in HOT STANBY within the next 6 hours.

Exam Bank No.: 2336

K/A Catalog Number: 022 G2.2.39 **Tier:** 2 **Group/Category:** 1

SRO Importance: 4.5 **10CFR Reference or SRO Objective:** 55.43(b)(2)

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

STP Lesson: LOT 503.01 **Objective Number:** 80056

Given a system scenario, DETERMINE the applicable Technical Specification and/or Technical Requirements Manual (TRM) for the system and APPLY the specification(s).

Reference:

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified From**

Distractor Justification

A: INCORRECT: This distractor is credible because the pressure listed is positive 0.2 psig and the student has to remember that normal containment pressure goes from the negative range of pressure to a positvie range. Also, restoring pressure within 8 hours is credible because that is the time reguirement for when Containment temperature is out of limit.

B: INCORRECT: This distractor is credible because the pressure listed is positive 0.2 psig and the student has to remember that normal containment pressure goes from the negative range of pressure to a positvie range.

C: INCORRECT: This distractor is credible because restoring pressure within 8 hours is the time reguirement for when Containment temperature is out of limit.

D: CORRECT: The Containment Pressure Alarm will come in at -0.1 psig and lowering and 0.3 psig and rising. With this alarm in TS 3.6.1.4 is entered for Containemnt pressure and the pressure must be restored to within -0.1 to 0.3 psig within 1 hour.

Question Level: F **Question Difficulty** 3

Justification:

The student must have knowledge of TS actions of less than 1 hour and knowledge of the limits for normal containment pressure.

Exam Bank No.: 2291 **Last used on an NRC exam:** Never

SRO Sequence Number: 80

In accordance with 0POP08-FH-0009, Core Refueling, which TWO of the following are specific responsibilities of the Core Load Supervisor?

1. Agree to changes made to an Approved Fuel Transfer Form.
2. Implementation of 0POP08-FH-0009, Core Refueling, procedure.
3. Review Fuel Assembly visual checks performed during fuel movement.
4. Provide Independent Verification of Fuel Assembly location.

A. 1 and 2

B. 2 and 3

C. 3 and 4

D. 1 and 4

Answer: A 1 and 2

Exam Bank No.: 2291

K/A Catalog Number: G2.1.35 **Tier:** 3 **Group/Category:**

SRO Importance: 3.9 **10CFR Reference or SRO Objective:** 55.43(b)(7)

Knowledge of the fuel-handling responsibilities of SROs.

STP Lesson: LOT 201.43 **Objective Number:** 66407

DESCRIBE the procedural requirements of the fuel handling equipment operating procedure(s) to include purpose, scope, precautions and limitations.

Reference: LOT 201.43 Lesson Plan and 0POP08-FH-0009, Core Refueling

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified From**

Distractor Justification

A: CORRECT: The Core Load Supervisor is required to agree with any changes made to an approved Fuel Transfer Form and implements the Core Refueling procedure.

B: INCORRECT: This distractor is credible because the CLS oversees all fuel movement but the Reactor Engineers are responsible for reviewing the visual checks performed during fuel movement.

C: INCORRECT: This distractor is credible because the CLS oversees all fuel movement but the Reactor Engineers are responsible for reviewing the visual checks performed during fuel movement. Also, up until recently (2RE16) the CLS did perform independent verification of fuel assembly location in the Reactor Core but a recent lesson learned on Supervisory oversite and industry practice has led to STP having another individual on the refuel team perform the Ivs on fuel movement in the Reactor Core.

D: INCORRECT: This distractor is credible because up until recently (2RE16) the CLS did perform independent verification of fuel assembly location in the Reactor Core but a recent lesson learned on Supervisory oversite and industry practice has led to STP having another individual on the refuel team perform the Ivs on fuel movement in the Reactor Core.

Question Level: F **Question Difficulty** 3

Justification:

The student must have knowledge of the responsiblities of SROs including those of the CLS.

Exam Bank No.: 201 **Last used on an NRC exam:** Never

SRO Sequence Number: 81

Unit 1 experienced an RCS leak. The reactor failed to manually trip when attempted. The crew is proceeding through 0POP05-EO-FRS1, Response To Nuclear Power Generation – ATWS.

While performing step #8, "Check If The Following Trips Have Occurred", the following occurs:

- Safety Injection
- All rods insert

Which of the following actions should the Unit Supervisor take?

A. Immediately exit FRS1 and return to 0POP05-EO-EO00, Reactor Trip or Safety Injection.

B. Complete the actions of FRS1, then transition to 0POP05-EO-EO10, Loss Of Reactor Or Secondary Coolant.

C. Complete the actions of FRS1, then return to 0POP05-EO-EO00, Reactor Trip or Safety Injection.

D. Immediately exit FRS1 and transition to 0POP05-EO-EO10, Loss Of Reactor Or Secondary Coolant.

Answer: C Complete the actions of FRS1, then return to 0POP05-EO-EO00, Reactor Trip or Safety Injection

Exam Bank No.: 201

K/A Catalog Number: G2.4.6 **Tier:** 3 **Group/Category:**

SRO Importance: 4.7 **10CFR Reference or SRO Objective:** 55.43(b)(5)

Knowledge of EOP mitigation strategies.

STP Lesson: LOT 504.04 **Objective Number:** 92283

Given a set of conditions and the occurrence of a Red, Orange, or Yellow path CSF, STATE the action required per 0POP01-ZA-0018, EOP Users Guide

Reference: POP01-ZA-0018 step 6.12; POP05-EO-FRS1 step 20

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified From**

Distractor Justification

A: INCORRECT: Plausible because this would be correct for certain transitions (e.g. from ORP to Red condition)

B: INCORRECT: Plausible because E10 is ultimately the procedure that will be performed, but the applicant must understand the network useage to correct respond.

C: CORRECT: Once entered, an FRP is completed until a kick-out occurs which in this case would be "procedure in effect" (which was EO).

D: INCORRECT: Plausible because E10 is ultimately the procedure that will be performed, but the applicant must understand the network useage to correct respond.

Question Level: H **Question Difficulty** 3

Justification:

The applicant must analyze the given conditions/actions taken and with procedure knowledge, determine the correct course of action.

Exam Bank No.: 416 **Last used on an NRC exam:** 1997

SRO Sequence Number: 82

Given the following:

- A Small Break LOCA has occurred
- Primary plant conditions have been stabilized and SI has been terminated in accordance with 0POP05-EO-ES11, SI Termination.
- Operators have just restored MINIMUM charging flow and continue performing ES11 when the following conditions are identified:
  - RCS subcooling is 45°F and stable
  - Pressurizer level is 5% and stable
  - Adverse Containment Conditions do NOT exist

Which of the following actions should the Unit Supervisor direct?

A. Raise charging flow to restore pressurizer level and continue with 0POP05-EO-ES11, SI Termination.

B. Operate SI pumps and continue with 0POP05-EO-ES11, SI Termination.

C. Operate SI pumps and transition to 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant.

D. Manually initiate SI and transition to 0POP05-EO-EO00, Reactor Trip or Safety Injection.

Answer: A Raise charging flow to restore pressurizer level and continue with 0POP05-EO-ES11, SI Termination.

Exam Bank No.: 416

K/A Catalog Number: EPE E02 EA2.2 **Tier:** 1 **Group/Category:** 2

SRO Importance: 4.0 **10CFR Reference or SRO Objective:** 55.43(b)(5)

Knowledge of the interrelations between the (SI Termination) and the following: Adherence to appropriate procedures and operation within the limitations in the facility*s license and amendments.

STP Lesson: LOT 504.07 **Objective Number:** 92226

LIST the conditions in 0POP05-EO-ES11 which would require manually restarting the SI pumps.

Reference: 0POP05-EO-ES11, Step 9

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified From**

Distractor Justification

A: CORRECT: When SI Reinitiation criteria is met on low PRZR level (in ES11) the first action is to control charging flow to restore pressurizer level to >8%.

B: INCORRECT: Plausible because operation of SI pumps is required when attempts to restore PRZR level fail, then transition to EO10 would be appropriate.

C: INCORRECT: Plausible because operation of SI pumps is required when attempts to restore PRZR level fail (along with transition to EO10).

D: INCORRECT: Plausible because under different conditions (e.g. ES01), this would be the correct path.

Question Level: H **Question Difficulty** 3

Justification:

This item tests the applicnat's knowledge of the EOP’s Safety Injection (SI) Reinitiation Criteria. The applicant must identify that pressurizer level meets SI Reinitiation criteria, however; since charging flow is at its MINIMUM, all that is required is an increase in charging flow to restore pressurizer level.

Exam Bank No.: 1613 **Last used on an NRC exam:** Never

SRO Sequence Number: 83

Given the following:

- Unit 1 is operating at 96% power and rising per 0POP05-ZG-0005, Plant Startup to 100%.
- The EHC Panel is in the IMP IN Mode.
- A failure in the Steam Dump control circuitry causes ONE Steam Dump Valve to open.

Which of the following correctly describes the approximate power level the plant would reach if no operator action is taken AND the procedure the Unit Supervisor should use to mitigate the consequences?

	Approximate Power Level	**Procedure**
A.	103% Power	0POP04-MS-0001, Excessive Steam Demand
B.	99% Power	0POP04-TM-0001, Turbine Load Rejection
C.	103% Power	0POP04-TM-0001, Turbine Load Rejection
D.	99% Power	0POP04-MS-0001, Excessive Steam Demand

Answer: D 99% Power - 0POP04-MS-0001, Excessive Steam Demand

Exam Bank No.: 1613

K/A Catalog Number: 041 A2.02 **Tier:** 2 **Group/Category:** 2

SRO Importance: 3.9 **10CFR Reference or SRO Objective:** 55.43(b)(5)

Ability to (a) predict the impacts of the following malfunctions or operations on the SDS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Steam valve stuck open.

STP Lesson: LOT 202.09 **Objective Number:** 93002

Given plant conditions, DETERMINE their effects on the Steam Dump System.

Reference: LOT 202.09 Lesson Plan PPT Slide #18

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified From**

Distractor Justification

A: INCORRECT: This distractor is credible because power will rise but a rise to 103% would be about that of an open SG PORV.

B: INCORRECT: This distractor is credible because some of the indications for a turbine load rejection would occur (Tref/Auct Tavg Dev/DT Rod Block) but entering 0POP04-TM-0001 would not be the correct procedure to midigate the consequences for a stuck open steam dump.

C: INCORRECT: This distractor is credible because power will rise but a rise to 103% would be about that of an open SG PORV. Also, some of the indications for a turbine load rejection would occur (Tref/Auct Tavg Dev/DT Rod Block) but entering 0POP04-TM-0001 would not be the correct procedure to midigate the consequences for a stuck open steam dump.

D: CORRECT: A Steam Dump valve full open is equal to about 3% power. Even though the max power in this case would not be above 100%, 0POP04-MS-0001, Excessive Steam Demand would still be the appropriate procedure to mitgate the consequences and have steps to isolate the steam dump.

Question Level: H **Question Difficulty** 3

Justification:

The student must be able to evaluate the given condition to predict the effect of open steam dumps on reactor power and the proper procedure to mitigate the consequences.

Exam Bank No.: 1705 **Last used on an NRC exam:** Never

SRO Sequence Number: 84

Given the following:

- Unit 1 is operating at full power.
- RT-8011, RCB Atmosphere Radiation Monitor, shows rising activity.
- A 12 gpm through-wall pipe leak in the letdown line JUST UPSTREAM of CV-MOV-0023, Letdown ICIV, is reported.

BEFORE any operator action is taken, the Unit Supervisor would enter the Tech Spec for _____(1)_____. If CV-FV-0011, LTDN ORIF HDR ISOL, is closed, then RT-8011, RCB Atmosphere Radiation Monitor, activity will _____(2)_____.

A. (1) RCS Pressure Boundary Leakage; (2) continue to rise.

B. (1) RCS Pressure Boundary Leakage; (2) lower.

C. (1) RCS Identified Leakage; (2) lower.

D. (1) RCS Identified Leakage; (2) continue to rise.

Answer: C RCS Identified Leakage; lower

Exam Bank No.: 1705

K/A Catalog Number: APE 060 AA2.04 **Tier:** 1 **Group/Category:** 2

SRO Importance: 3.4 **10CFR Reference or SRO Objective:** 55.43(b)(2)

Ability to determine and interpret the following as they apply to the Accidental Gaseous Radwaste Release: the effects on the power plant of isolating a given radioactive gas leak.

STP Lesson: LOT 503.01 **Objective Number:** SRO9210 2

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: LOT 201.06, TS 3.4.6.2

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified From**

Distractor Justification

A: INCORRECT: Plausible leakage description because it is one of the defined leakages, so the applicant must know the definitions and location of the leak to be able to make a judgement. RT-8011 trend is plausible since it will continue if the leak is not isolated requiring a knowledge of system design.

B: INCORRECT: Plausible leakage description because it is one of the defined leakages, so the applicant must know the definitions and location of the leak to be able to make a judgement.

C: CORRECT - A leak in the LD line is not pressure boundary leakage because it can be isolated. Since the leak is in the RCB on the letdown line and FV-0011 is in the RCB, closing FV-0011 will isolate the leak, resulting in lowering activity on RT-8011.

D: INCORRECT: RT-8011 trend is plausible since it will continue if the leak is not isolated requiring a knowledge of system design.

Question Level: H **Question Difficulty** 3

Justification:

The applicant must have knowledge of CVCS design, how RCS leakage is classified and be able to apply it to the given conditions.

Exam Bank No.: 1763 **Last used on an NRC exam:** 2009

SRO Sequence Number: 85

A Reactor trip has occurred due to a Loss of Offsite Power (LOOP) and the crew has reached step 16 of 0POP05-EO-ES02, Natural Circulation Cooldown, to initiate RCS depressurization.

Plant conditions are as follows:

- One CRDM fan is running
- CET temperature is 500° F
- RCS pressure is 1200 psig
- Upper head temperature is 520° F
- Auxiliary spray valve is closed

Based on these conditions, what is the NEXT action the Unit Supervisor should direct the crew to take? (appropriate procedure sections are attached)

0POP05-EO-ES02, Natural Circulation Cooldown, ...

A. step 16.b to raise RCS pressure to establish greater than 85° F subcooling based on core exit T/Cs.

B. steps 16.c and 16.d to ensure Normal Spray Valves are closed and then open the Auxiliary Spray Valve.

C. RNO step 16.a.1 to raise RCS pressure to establish greater than 100° F subcooling based on core exit T/Cs.

D. RNO step 16.a.3 to open the Reactor Vessel Head Vent Isolation Valves and one Reactor Vessel Head Vent Throttle Valve.

Answer: C RNO step 16.a.1 to raise RCS pressure to establish greater than 100° F subcooling based on core exit T/Cs.

Exam Bank No.: 1763

K/A Catalog Number: G2.1.25 **Tier:** 3 **Group/Category:**

SRO Importance: 4.2 **10CFR Reference or SRO Objective:** 55.43(b)(5)

Ability to interpret reference materials, such as graphs, curves, tables, etc.

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, step 16, addendums 1, 2, and 3

Attached Reference ☑ **Attachment:** 0POP05-EO-ES02, step 16, addendums 1, 2, and 3

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified From**

Distractor Justification

A: INCORRECT: Plausible because this is the action for step 16.b, which is innapropriate since only 1 CRDM fan is running.

B: INCORRECT: Plausible because this would be the correct choice if the candidate innapropriately determined subcooling criteria were met.

C: CORRECT: Based on the indications given, subcooling per Addendum 2 is not met and must be established per RNO 16.a.1

D: INCORRECT: Plausible because this would be the correct choice if the Addendum 2 criteria is met and upper head subcooling is less than 10 degrees.

Question Level: H **Question Difficulty** 3

Justification:

The applicant must assess the given conditions using the procedure given and determine the correct action to be taken.

Exam Bank No.: 1781 **Last used on an NRC exam:** Never

SRO Sequence Number: 86

Given the following:

- Unit 1 is operating at 48% power
- CP-005 Annunciator 5M02-A-1, RC LOOP FLOW LO RX PRETRP alarms
- First Out Annunciator LOSS OF RC FLOW ABOVE P8 alarms

Which of the following correctly describes the plant condition AND the FIRST procedure the Unit Supervisor should enter?

An automatic Reactor trip should…

A. have occurred. The Unit Supervisor should FIRST enter 0POP05-EO-EO00, Reactor Trip or Safety Injection.

B. have occurred. The Unit Supervisor should FIRST enter 0POP05-EO-FRS1, Response to Nuclear Power Generation – ATWS.

C. NOT have occurred. The Unit Supervisor should FIRST enter 0POP04-RC-0002, Reactor Coolant Pump Off Normal.

D. NOT have occurred. The Unit Supervisor should FIRST enter 0POP09-AN-05M2-A-1, RC LOOP FLOW LO RX PRETRP.

Answer: A have occurred. The Unit Supervisor should enter 0POP05-EO-EO00, Reactor Trip or Safety Injection.

Exam Bank No.: 1781

K/A Catalog Number: EPE 007 EA2.05 **Tier:** 1 **Group/Category:** 1

SRO Importance: 3.9 **10CFR Reference or SRO Objective:** 55.43(b)(5)

Reactor Trip-Stabilization-Recovery: Ability to determine and interpret the following as they apply to a reactor trip:
Reactor trip first-out indication.

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: 0POP09-AN-05M2 Rev 35, Window A-1

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: Bank **Modified From**

Distractor Justification

A: CORRECT: Low flow in any RCS loop should initiate a reactor trip if above P8. This is an ATWS event, but the FIRST procedure to be entered should be 0POP05-EO-EO00, Reactor Trip or Safety Injection.

B: INCORRECT: This distractor is credible because Low flow in any RCS loop should initiate a reactor trip if above P8. However, this is an ATWS event, but the first EOP to be entered should be 0POP05-EO-EO00, Reactor Trip or Safety Injection, not 0POP05-EO-FRS1, Response to Nuclear Power Generation - ATWS. 0POP05-EO-FRS1, Response to Nuclear Power Generation - ATWS, would be entered only after the reactor could not be tripped automatically or manually from the control room.

C: INCORRECT: This distractor is credible because low flow in one RCS loop will not cause a reactor trip if the Unit is below the P-8 setpoint (40%). At 48% power the reactor is below the P-9 setpoint which does not trip the reactor if the main turbine trips. Entering 0POP04-RC-0002, Reactor Coolant Pump Off Normal, FIRST would be credible if the reactor had not tripped. This procedure is an off-normal procedure.

D: INCORRECT: This distractor is credible because low flow in one RCS loop will not cause a reactor trip if the Unit is below the P-8 setpoint (40%). At 48% power the reactor is below the P-9 setpoint which does not trip the reactor if the main turbine trips. Entering 0POP09-AN-05M2, A-1, LOOP FLOW LO RX PRETRP, FIRST would be credible if the reactor had not tripped. This annunciator is a yellow annunciator.

Question Level: H **Question Difficulty** 3

Justification:

Student must assimilate given plant conditions with knowledge of automatic reactor trips and procedural useage guidance to determine the appropriate procedure.

Exam Bank No.: 2274 **Last used on an NRC exam:** Never

SRO Sequence Number: 87

Unit 1 tripped from 100% power due to a Small Break Loss of Coolant Accident (SBLOCA).

The following was noted after the SBLOCA initiated:

- All High Head Safety Injection (HHSI) Pumps failed to start.
- 0POP05-EO-FRC1, RESPONSE TO INADEQUATE CORE COOLING, was entered due to Core Exit Thermocouples (CETs) rising to 1250ºF.

Two HHSI Pumps have now been repaired and placed in service.

The following conditions now exist:

- Operating Crew is at Step 16 of 0POP05-EO-FRC1, RESPONSE TO INADEQUATE CORE COOLING, CHECK Core Cooling.
- CETs are at 605ºF.
- All RCS Hot Leg temperatures are 330ºF.
- Reactor Vessel Water Level (RVWL) is 33% Plenum and 0% Head.

Which of the following describes the condition of Core Cooling and the procedure the Unit Supervisor should transition to next?

	Core Cooling	**Procedure Transition**
A.	INADEQUATE	SACRG-1, SEVERE ACCIDENT CONTROL ROOM GUIDELINE INITIAL RESPONSE
B.	INADEQUATE	0POP05-EO-FRC2, RESPONSE TO DEGRADED CORE COOLING
C.	ADEQUATE	0POP05-EO-EO10, LOSS OF REACTOR OR SECONDARY COOLANT
D.	ADEQUATE	0POP05-EO-ES11, SI TERMINATION

Answer: C ADEQUATE - 0POP05-EO-EO10, LOSS OF REACTOR OR SECONDARY COOLANT

Exam Bank No.: 2274

K/A Catalog Number: EPE 009 EA2.39 **Tier:** 1 **Group/Category:** 1

SRO Importance: 4.7 **10CFR Reference or SRO Objective:** 55.43(b)(5)

Ability to determine or interpret the following as they apply to a small break LOCA: Adequate core cooling.

STP Lesson: LOT 502.05 **Objective Number:** 50363

Define adequate core cooling.

Reference: LOT 502.05 Lesson Plan and 0POP05-EO-FRC1, RESPONSE TO INADEQUATE CORE COOLING

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified From**

Distractor Justification

A: INCORRECT: This distractor is credible because even though RVWL level is low it is OK for transition ing out of 0POP05-EO-FRC1. FRC1 allows for RVWL level to be used (greater than 20%) instead of PZR level.Also, if the student believes that Core Cooling is inadequate then a transition to SACRG-1, SEVERE ACCIDENT CONTROL ROOM GUIDELINE INITIAL RESPONSE, is credible because there is a transition from 0POP05-EO-FRC1.

B: INCORRECT: This distractor is credible because even though RVWL level is low it is OK for transition ing out of 0POP05-EO-FRC1. FRC1 allows for RVWL level to be used (greater than 20%) instead of PZR level. Also, if the student believes that Core Cooling is still inadequate but getting better (Critical Safety Function has changed from Red to an Orange Path), then it would be credible to believe a transition to 0POP05-EO-FRC2, RESPONSE TO DEGRADED CORE COOLING, would be next.

C: CORRECT: RVWL plenum level of greater than 20% is allowed to be used to transition out of 0POP05-EO-FRC1, RESPONSE TO INADEQUATE CORE COOLING. The correct procedure transition is 0POP05-EO-EO10, LOSS OF REACTOR OR SECONDARY COOLANT.

D: INCORRECT: This distractor is credible because eventually SI termination would be possible since 2 HHSI Pumps are now running and conditions are improving, but a different set of criteria are used to determine SI termination especially PZR level which would not be meet in the condition given.

Question Level: H **Question Difficulty** 3

Justification:

The student must be able to analize the condition given to determine the status of core cooling an then the procedure that should be entered.

Exam Bank No.: 2283 **Last used on an NRC exam:** Never

SRO Sequence Number: 88

Given the following:

- Unit 2 is in Mode 6 performing a core offload
- RHR inlet temperature is 120°F and being maintained by two trains of RHR
- Due to a containment Isolation Valve failure, Instrument Air is lost to containment

Which of the following indicates the expected trend in RHR inlet temperature due to the loss of Instrument Air AND the MAXIMUM unexpected change in RHR temperature (between successive readings) that is allowed by 0POP08-FH-0009, Core Refueling, before core alterations must be secured?

	Expected RHR inlet temperature trend.	**MAXIMUM unexpected change in RHR temperature that is allowed by 0POP08-FH-0009 before core alterations must be secured.**
A.	Up	10°F
B.	Up	5°F
C.	Down	10°F
D.	Down	5°F

Answer: C Down; 10°F

Exam Bank No.: 2283

K/A Catalog Number: APE 065 G2.1.36 **Tier:** 1 **Group/Category:** 1

SRO Importance: 4.1 **10CFR Reference or SRO Objective:** 55.43(b)(6)

Loss of Instrument Air: Knowledge of procedures and limitations involved in core alterations.

STP Lesson: LOT 801.01 **Objective Number:** SRO-60040

Discuss the requirements of the Core Refueling, 0POP08-FH-0009 to include: B. Notes and Precautions

Reference: 0POP08-FH-0009 step 5.5

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified From**

Distractor Justification

A: INCORRECT: Plausible temperature trend because it could be correct based on the applicants understanding of the fail mode for the valves involved.

B: INCORRECT: Plausible temperature trend because it could be correct based on the applicants understanding of the fail mode for the valves involved. Plausible temperature limit because 5 is a limit contained in the procedure (maximum source range change).

C: CORRECT: RHR control valves fail in such a way that maximum cooling takes place upon loss of air. There is a limit of 10 degrees for an unexpected RHR temperature change.

D: INCORRECT: Plausible temperature limit because 5 is a limit contained in the procedure (maximum source range change).

Question Level: F **Question Difficulty** 3

Justification:

The applicant must have knowledge of the failure mode for RHR control valves and the limits found in the Core Refueling procedure.

Exam Bank No.: 2284 **Last used on an NRC exam:** Never

SRO Sequence Number: 89

Given the following:

- Unit 2 automatically tripped on Lo-Lo Steam Generator level following a loss of all Main Feedwater
- The crew has completed the immediate action steps of 0POP05-EO-EO00, Reactor Trip of Safety Injection and determined Safety Injection has not actuated and is not required
- Due to various malfunctions, only AFW Pump 22 is running supplying 580 gpm of flow to Steam Generator 'B'
- All Steam Generator narrow range levels are off-scale low

Which of the following describes procedure transition the Unit Supervisor should make AND the maximum allowed flow for an AFW Pump to prevent runout and restore steam generator levels?

	TRANSITION TO …..	**MAXIMUM AFW PUMP FLOW**
A.	0POP05-EO-FRH1, Response to Loss of Secondary Heat Sink	640 gpm
B.	0POP05-EO-FRH1, Response to Loss of Secondary Heat Sink	675 gpm
C.	0POP05-EO-ES01, Reactor Trip Response	640 gpm
D.	0POP05-EO-ES01, Reactor Trip Response	675 gpm

Answer: D 0POP05-EO-ES01, Reactor Trip Response; 675 gpm

Exam Bank No.: 2284

K/A Catalog Number: APE 054 AA2.06 **Tier:** 1 **Group/Category:** 1

SRO Importance: 4.3 **10CFR Reference or SRO Objective:** 55.43(b)(5)

Ability to determine and interpret the following as they apply to the Loss of Main Feedwater (MFW): AFW adjustments needed to maintain proper T-avg. and S/G levels.

STP Lesson: LOT 504.05 **Objective Number:** 80399

From memory, STATE/IDENTIFY how total AFW flow is verified to be sufficient in the event of a Safety Injection and/or Reactor Trip.

Reference: LOT 504.05 Lesson Plan and 0POP05-EO-EO00, Reactor Trip and SI.

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified From**

Distractor Justification

A: INCORRECT: Plausible because all SG levels are low and AFW flow is minimal. The given max AFW flow is the high end of the band for auto AFW control (550-640).

B: INCORRECT: Plausible because all SG levels are low and AFW flow is minimal.

C: INCORRECT: Plausible because the given max AFW flow is the high end of the band for auto AFW control.

D: CORRECT: Even though all SG levels are low, the given AFW flow is sufficient to satisfy heat sink requirements. 675 gpm is the max flow for a single AFW Pump (550-640).

Question Level: H **Question Difficulty** 3

Justification:

The applicant must be able to evaluate the conditons given for the RX Trip and determine the correct procedure to use and have knowledge of AFW design.

Exam Bank No.: 2286 **Last used on an NRC exam:** Never

SRO Sequence Number: 90

Given the following:

- Unit 2 is in Mode 3, cooling down in accordance with 0POP03-ZG-0007, Plant Cooldown.
- Pressurizer Pressure is 1700 psig and RCS Tave is 550°F
- Main Steam leak occurs in the IVC that results in a 110°F/Hr cooldown rate

Which of the following correctly identifies if there is an Engineered Safety Features Actuation System (ESFAS) automatic actuation that will isolate this steam leak AND the correct action for the Unit Supervisor should take?

	ESFAS ACTUATION	ACTION
A.	NO	Enter 0POP04-MS-0001, Excessive Steam Demand
B.	NO	Enter 0POP05-EO-EO00, Reactor Trip or Safety Injection
C.	YES	Enter 0POP04-MS-0001, Excessive Steam Demand
D.	YES	Enter 0POP05-EO-EO00, Reactor Trip or Safety Injection

Answer: A NO; Enter 0POP04-MS-0001 Excessive Steam Demand

Exam Bank No.: 2286

K/A Catalog Number: 013 A2.02 **Tier:** 1 **Group/Category:** 2

SRO Importance: 4.5 **10CFR Reference or SRO Objective:** 55.43(b)(5)

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

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-MS-0001 page 2, 0POP05-EO-EO00 page 2

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified From**

Distractor Justification

A: CORRECT: SI actuation on LO PZR and Steamline pressure was blocked at 1985 psig. SI on RCB HI pressure and Steamline isolation on high pressure rate still exist but will not come into play under the given conditions. Since SI is blocked, 0POP04-MS-0001 would be the correct procedure entry.

B: INCORRECT: Procedure is plausible because E0 is still applicable under the given conditions, however entry conditions have not been met.

C: INCORRECT: Actuation is plausible because the mainsteamline actuation is still active and the applicant must determine that it won't actuate under the given conditions.

D: INCORRECT: Actuation is plausible because the mainsteamline actuation is still active and the applicant must determine that it won't actuate under the given conditions. Procedure is plausible because E0 is still applicable under the given conditions, however entry conditions have not been met.

Question Level: H **Question Difficulty** 3

Justification:

The applicant must analyze the given conditions to determine if an automatic actuation is available and then with knowledge of procedure implementation, determine the correct procedure to enter.

Exam Bank No.: 2287 **Last used on an NRC exam:** Never

SRO Sequence Number: 91

Given the following:

- Unit 1 is in Mode 4 with the RCS in a water solid condition per Addendum 9, Plant Cooldown with PZR Water Solid, of 0POP03-ZG-0007, Plant Cooldown.
- CVCS Charging flow is in manual.
- RCS pressure is 330 psig with 'PRESS CONT PCV-0135' in Auto.
- 1A and 1C RHR pumps are in service per NOTES of Addendum 9, Plant Cooldown with PZR Water Solid.
- 1B RHR pump is available.

Subsequently:

- 1A RHR Pump trips on motor overcurrent.

Which of the following describes the INITIAL impact of the 1A RHR Pump trip and the procedure the US should enter?

	INITIAL IMPACT	PROCEDURE
A.	RHR Pump suction pressure will remain the same.	0POP02-RH-0001, Residual Heat Removal System Operation, to restore RCS cooling.
B.	RHR Pump suction pressure will rise.	0POP02-RH-0001, Residual Heat Removal System Operation, to restore RCS cooling.
C.	RHR Pump suction pressure will remain the same.	0POP02-CV-0004, Chemical and Volume Control System Subsystem, and secure letdown.
D.	RHR Pump suction pressure will rise.	0POP02-CV-0004, Chemical and Volume Control System Subsystem, and secure letdown.

Answer: D RHR Pump suction pressure will rise.; 0POP02-CV-0004, Chemical and Volume Control System Subsystem, and secure letdown.

Exam Bank No.: 2287

K/A Catalog Number: 005 A2.03 **Tier:** 2 **Group/Category:** 1

SRO Importance: 3.1 **10CFR Reference or SRO Objective:** 55.43(b)(5)

Ability to (a) predict the impacts of the following malfunctions or operations on the RHRS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations;
RHR pump/motor malfunction.

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

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

Reference: 0POP09-AN-01M2 page 45 and 0POP03-ZG-0007, Plant Cooldown, Addendum 9, Plant Cooldown with the PZR Water Solid

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified From**

Distractor Justification

A: INCORRECT: This distractor is credible because if the student believes that RHR Pump 1A is the pump doing the cooling and RHR 1C is providing letdown then RCS pressure would INITIALLY remain the same and cooling would be effected. However, only RHR Pumps 1A and 1B provide letdown. If this pump was supplying cooling, then IAW the POP09, the RHR procedure would be the correct entry.

B: CORRECT: If this pump was supplying cooling, then IAW the POP09, the RHR procedure would be the correct entry.

C: INCORRECT: This distractor is credible because if the student believes that RHR Pump 1A is the pump doing the cooling and RHR 1C is providing letdown then RCS pressure would INITIALLY remain the same and cooling would be effected. However, only RHR Pumps 1A and 1B provide letdown.

D: CORRECT: During solid plant conditions the RHR pump being used for letdown will not be used for cooling. In this case RHR pump 1A is the only one that can be used for letdown so RHR 1C is used for cooling. When 1A RHR pump trips then letdown flow lowers and RCS pressure INITIALLY rises (charging flow is in manual) until corrected by PCV-0135 adjusting more open to lower pressure. IAW the POP09, POP02-CV-0004 will be enetered to secure letdown under these conditions.

Question Level: H **Question Difficulty** 3

Justification:

The student must be able to evaluate the given RHR conditions and determine the effect of lossing an RHR pump and the correct procedure to use.

Exam Bank No.: 2288 **Last used on an NRC exam** Never

SRO Sequence Number 92

Given the following:

- A SGTR has occurred in Unit 1.
- Operators are performing a cooldown at maximum rate to 505°F using steam dumps per 0POP05-EO-EO30, Steam Generator Tube Rupture.
- UI-0555, DEMAND meter reads 50%.
- Tave is 547°F.
- One of the steam dump valves fails closed.

Which of the following describes the effect on TOTAL steam flow AND the procedural actions the Unit Supervisor should take?

	TOTAL steam flow …	**ACTION**
A.	remains the same.	Continue with 0POP05-EO-EO30, Steam Generator Tube Rupture.
B.	remains the same.	Enter 0POP04-MS-0001, Excessive Steam Demand, and manually isolate the affected valve to prevent re-opening and raising steam flow.
C.	lowers.	Raise steam dump demand using PK-0557, HDR PRESS CONT, per 0POP05-EO-EO30, Steam Generator Tube Rupture.
D.	lowers.	Open one Steam Generator PORV per 0POP01-ZA-0018, Emergency Operating Procedures Users Guide.

Answer: lowers; Open one Steam Generator PORV per 0POP01-ZA-0018, Emergency Operating Procedures Users Guide.

Exam Bank No.: 2288

K/A Catalog Number: 039 A2.04 **Tier:** 2 **Group/Category:** 1

SRO Importance: 3.7 **10CFR Reference or SRO Objective:** 55.43(b)(5)

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

STP Lesson: LOT 505.01 **Objective Number:** 92408

Given a copy of a step from 0POP05-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: 0POP01-ZA-0018 step 4.33.2

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified From**

Distractor Justification

A: INCORRECT: Effect is plausible because under different conditions, steam dumps will automatically control (however this is not one of them). Action is plausible based on the effect because steam flow is the same.

B: INCORRECT: Effect is plausible because under different conditions, steam dumps will automatically control (however this is not one of them). Action is plausible because MS-01 coveres malfunctioning steam dumps and isolation is one of the listed actions, however MS-01 would not be entered under these conditions.

C: INCORRECT: Action is plausible because E-30 gives directions to control steam dumps and if steam flow is low, operating this controller is a way to raise it (except in this case with the 3 cooldown valves maxed out.

D: CORRECT: Under the given conditions, when one valve fails closed, no others will automatically open to make up the difference. ZA-18 allows using one SG PORV to replace a non-functioning steam dump (which should be done to meet the intent of max rate cooldown).

Question Level: H **Question Difficulty** 3

Justification:

The applicant must analyze the conditions/events given to determine the effect on steam flow and then with a knowledge of procedures, select the correct action.

Exam Bank No.: 2290 **Last used on an NRC exam:** Never

SRO Sequence Number: 93

Given the following:

- Unit 1 is in Mode 4, cooling down to Mode 5 during a refueling outage
- 2 trains of RHR are in service
- All RCPs are secured
- The SR SHUTDN FLUX HI alarm comes in
- The Reactor Operator confirms a positive startup rate is showing on both Source Range Monitors

Which of the following describes the procedure the Unit Supervisor will enter AND an action take to mitigate this event in accordance with that procedure?

	PROCEDURE ENTERED	ACTION TAKEN
A.	0POP05-EO-FRS1, Response To Nuclear Power Generation - ATWS	Ensure Containment Ventilation Isolation
B.	0POP04-RC-0008, Boron Dilution Event	Initiate a Containment Evacuation
C.	0POP05-EO-FRS1, Response To Nuclear Power Generation - ATWS	Initiate a Containment Evacuation
D.	0POP04-RC-0008, Boron Dilution Event	Ensure Containment Ventilation Isolation

Answer: B 0POP04-RC-0008, Boron Dilution Event; Initiate a Containment evacuation

Exam Bank No.: 2290

K/A Catalog Number: 013 G2.4.9 **Tier:** 2 **Group/Category:** 2

SRO Importance: 4.2 **10CFR Reference or SRO Objective:** 55.43(b)(5)

Nuclear Instrumentation System: Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.

STP Lesson: LOT 505.01 **Objective Number:** 92106

Given plant conditions/symptoms, evaluate the conditions/symptoms and sate whether or not the referenced procedure is to be used.

Reference: 0POP04-RC-0008 page 2; 0POP05-EO-FRS1 page 2

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified From**

Distractor Justification

A: INCORRECT: Procedure is plausible because FRS1 is applicable in this mode and would likely be entered (orange path) with similar indications had the event started while the unit was in mode 3. Action is plausible because it is an action contained within FRS1

B: CORRECT: This is an entry condition for RC-08. Step 4 of RC-08 directs the operators to initiate containment evacuation

C: INCORRECT: Procedure is plausible because FRS1 is applicable in this mode and would likely be entered (orange path) with similar indications had the event started while the unit was in mode 3

D: INCORRECT: Action is plausible because it is an action contained within FRS1 which is a procedure used to mitigate a similar event under different circumstances

Question Level: H **Question Difficulty** 3

Justification:

The applicant must analyze the given plant events/conditions and determine using a knowledge of plant procedures, which procedure to enter and must have further procedure knowledge to determine which action is correct for the given procedure.

Exam Bank No.: 2292 **Last used on an NRC exam:** Never

SRO Sequence Number: 94

Given the following:

- Fuel movement is occurring within the Spent Fuel Pool (SFP)
- All 3 RM-11 consoles fail

In accordance with 0POP04-RA-0003, Loss of RM-11, which of the following indicates the effect on fuel movement activities of the failure?

Fuel movement ….

A. must be stopped because a fuel handling accident causing high radiation levels would not result in an automatic action of the ventilation system.

B. must be stopped until an individual is stationed at the RM-23 panel to monitor SFP area radiation.

C. may continue provided radiation levels are monitored locally.

D. may continue provided all personnel not directly involved in the fuel movement are removed from the Fuel Handling Building.

Answer: C may continue provided radiation levels are monitored locally

Exam Bank No.: 2292

K/A Catalog Number: 072 G2.1.32 **Tier:** 2 **Group/Category:** 2

SRO Importance: 4.0 **10CFR Reference or SRO Objective:** 55.43(b)(7)

Area Radiation Monitoring System: Ability to explain and apply system limits and precautions.

STP Lesson: LOT 505.01 **Objective Number:** 92109

Given a plant condition, describe and/or interpret the requirements and/or limits of a precaution or step of a referenced procedure.

Reference: 0POP04-RA-0003 note before step 1

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified From**

Distractor Justification

A: INCORRECT: Plausible because the RM-11 and RM-23 are easily confused (both provide idication, the RM-23 also provides actuations)

B: INCORRECT: Plausible because RM-23 is still functional but the SFP area radiation monitors do not feed into RM-23.

C: CORRECT: activities can continue provided local monitoring is occurring

D: INCORRECT: Plausible because it accounts for the safety of un-involved personnel

Question Level: F **Question Difficulty** 3

Justification:

The applicant must have a knowledge of the precedural requirements for this radiation hazard

Exam Bank No.: 2296 **Last used on an NRC exam:** Never

SRO Sequence Number: 95

Given the following:

- Unit 2 has experienced a Loss of Coolant Accident (LOCA)
- RWST level is 175,000 gal and lowering
- Operators are currently performing step 20 of 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant, to verify cold leg recirculation availability.
- The crew determines that none of the Containment Sump valves (SI-MOV-0016's) have power and Maintenance Personnel sent to investigate cannot restore power.

Which of the following indicates the action the Unit Supervisor should perform NEXT AND describes the Technical Specification consequences had this condition been identified while the Unit was operating at power?

	NEXT ACTION	AT POWER TECH SPEC CONSEQUENCES
A.	Immediately transition to 0POP05-EO-EC11, Loss of Emergency Coolant Recirculation.	Entry into a 72 hour LCO would be required.
B.	Remain in 0POP05-EO-EO10 and continue efforts to restore power.	Entry into a 72 hour LCO would be required.
C.	Immediately transition to 0POP05-EO-EC11, Loss of Emergency Coolant Recirculation.	Entry into a 1 hour LCO would be required.
D.	Remain in 0POP05-EO-EO10 and continue efforts to restore power.	Entry into a 1 hour LCO would be required.

Answer: C Immediately transition to 0POP05-EO-EC11, Loss of Emergency Coolant Recirculation; Entry into a 1 hour LCO would be required

Exam Bank No.: 2296

K/A Catalog Number: EPE E11 G2.2.39 **Tier:** 1 **Group/Category:** 1

SRO Importance: 4.5 **10CFR Reference or SRO Objective:** 55.43(b)(5)

Loss of Emergency Coolant Recirc: Knowledge of less than or equal to one hour Technical Specification action statements for systems

STP Lesson: LOT 504.09 **Objective Number:** 81084

Given a copy of a step from 0POP05-EO-EO10, 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-EO10 step 20

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified From**

Distractor Justification

A: INCORRECT: LCO is plausible because other systems (i.e. AFW) have a 72 hour action for multiple trains.

B: INCORRECT: Action is plausible because swapover is not required at this time (per the given RWST level) so it is reasonable to think additional time is given to make repairs. LCO is plausible because other systems (i.e. AFW) have a 72 hour action for multiple trains.

C: CORRECT: Immediate transition is required. The given conditions results in all 3 trains of ECCS being inoperable which is a 1 hour action.

D: INCORRECT: Action is plausible because swapover is not required at this time (per the given RWST level) so it is reasonable to think additional time is given to make repairs.

Question Level: H **Question Difficulty** 3

Justification:

The applicant must analyze the given conditions and apply procedural requirements to determine the correct response and have knowledge of Tech Spec requirements for the ECCS system

Exam Bank No.: 2297 **Last used on an NRC exam:** Never

SRO Sequence Number: 96

Given the following:

- Unit 1 is shutdown in Mode 3
- Annunciator 04M8-A-5, QDPS ALARM SHUTDOWN MONITOR comes in
- The Reactor Operator announces the unexpected alarm and reports that NI-45 is in alarm
- The crew begins performing the action of 0POP09-AN-04M8 for the annunciator

In accordance with 0POP09-AN-04M8, which of the following indicates the method used to validate the alarm AND the action the Unit Supervisor will direct if the alarm is validated?

	VALIDATION METHOD	ACTION
A.	Compare the trend for NI-45 to the trend of either NI-46, NI-31 or NI-32.	Enter 0POP04-CV-0003, Emergency Boration, and commence emergency boration.
B.	Request Chemistry sample the RCS and report the current boron concentration for comparison to the last sample results.	Enter 0POP04-CV-0003, Emergency Boration, and commence emergency boration.
C.	Compare the trend for NI-45 to the trend of either NI-46, NI-31 or NI-32.	Isolate boron dilution flowpaths within 15 minutes IAW 0PSP03-CV-0014, CVCS Equipment Verification.
D.	Request Chemistry sample the RCS and report the current boron concentration for comparison to the last sample results.	Isolate boron dilution flowpaths within 15 minutes IAW 0PSP03-CV-0014, CVCS Equipment Verification.

Answer: A Compare the trend for NI-45 to the trend of either NI-46, NI-31 or NI-32; Enter 0POP04-CV-0003, Emergency Boration, and commence emergency boration

Exam Bank No.: 2297

K/A Catalog Number: APE 024 G2.4.46 **Tier:** 1 **Group/Category:** 2

SRO Importance: 4.2 **10CFR Reference or SRO Objective:** 55.43(b)(5)

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

STP Lesson: LOT 201.16 **Objective Number:** 91251

Explain the basic operation of the shutdown monitor

Reference: 0POP09-AN-04M8, window A5

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified From**

Distractor Justification

A: CORRECT: Per the annunciator response, this is the correct method of validation and action.

B: INCORRECT: Validation method is plausible because dilution is generally the first cause that comes to mind in a situation such as this, however the source of the reactivity increase could be from elsewhere that the RCS sample would not detect and the sample is time consuming.

C: INCORRECT: Action is plausible because it is also contained in the annunciator response (and could stop a dilution event), but it is the action you take if a shutdown monitor is inoperable.

D: INCORRECT: Validation method is plausible because dilution is generally the first cause that comes to mind in a situation such as this, however the source of the reactivity increase could be from elsewhere that the RCS sample would not detect and the sample is time consuming. Action is plausible because it is also contained in the annunciator response (and could stop a dilution event), but it is the action you take if a shutdown monitor is inoperable.

Question Level: H **Question Difficulty** 3

Justification:

The applicant must compare given information to their knowledge of plant operation to determine the correct response

Exam Bank No.: 2293 **Last used on an NRC exam:** Never

SRO Sequence Number: 97

Due to an issue with pressure fluctuations, a local pressure recorder has been installed on ECW Pump 1B discharge line.

The pressure recorder is to remain installed for the next SIX weeks.

Which of the following SHALL be used to obtain authority and/or control the installation of the pressure recorder?

A. An entry in the Operator Aid Log in accordance with 0PGP03-ZO-0039, Operations Configuration Management.

B. Completion of a Temporary Modification Package in accordance with 0PGP03-ZO-0003, Temporary Modifications.

C. Written instructions prepared in accordance with 0PGP03-ZA-0010, Performing and Verifying Station Activities.

D. A daily entry in the US Shift Turnover Checklist in accordance with 0POP01-ZQ-0022, Plant Operations Shift Routines.

Answer: B Completion of a Temporary Modification Package in accordance with 0PGP03-ZO-0003, Temporary Modifications.

Exam Bank No.: 2293

K/A Catalog Number: G2.2.14 **Tier:** 3 **Group/Category:**

SRO Importance: 4.3 **10CFR Reference or SRO Objective:** 55.43(b)(3)

Knowledge of the process for controlling equipment configuration or status.

STP Lesson: LOT 802.10 **Objective Number:** SRO-10224

Given the description of a change to installed plant equipment, DETERMINE if the change consitutes a temporary modification in accordance with 0PGP03-ZO-0003.

Reference: LOT 802.10 Lesson Plan and 0PGP03-ZO-0003, Temporary Modifications

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified From**

Distractor Justification

A: INCORRECT: This distractor is credible because 0PGP03-ZO-0039 does track some types of configuration changes but not the installation of a pressure recorder.

B: CORRECT: The authority to install a pressure recorder to permanent plant equipment consitutes a temporary modification is controlled by 0PGP03-ZO-0003.

C: INCORRECT: This distractor is credible because 0PGP03-ZA-0010 does authorize control of equipment where no procedure instructions exist but not the change to equipment.

D: INCORRECT: This distractor is credible because 0POP01-ZQ-0022 does give on shift personel a way to track issues in the plant but it does not give authority to make the actual changes.

Question Level: F **Question Difficulty** 3

Justification:

The student must have knowledge of procedures that give authority to make changes to facility equipment.

Exam Bank No.: 2289 **Last used on an NRC exam:** Never

SRO Sequence Number: 98

Given the following:

- Unit 1 tripped from 100% power due to a simultaneous Loss of Offsite Power (LOOP) and Steam Generator Tube Rupture (SGTR) on SG 1C.
- All Train B ESF equipment was out of service for maintenance.
- ESF Diesel Generator #11 failed to start due to a ruptured fuel line.
- The Operating Crew is on Step 13 'CHECK If SG Tubes Are Intact' of 0POP05-EO-EO00, Reactor Trip or Safety Injection.

Subsequently the following occurs:

- A fire develops in the Relay Room.
- ESF Diesel Generator #13 trips due to the fire.

Which of the following should be the Unit Supervisor's next action?

Transition to…

A. 0POP05-EO-EO30, Steam Generator Tube Rupture

B. 0POP05-EO-EC00, Loss of All AC Power

C. 0POP04-ZO-0009, Safe Shutdown Fire Response

D. 0POP04-ZO-0001, Control Room Evacuation

Answer: D 0POP04-ZO-0001, Control Room Evacuation

Exam Bank No.: 2289

K/A Catalog Number: 064 G2.4.16 **Tier:** 2 **Group/Category:** 1

SRO Importance: 4.4 **10CFR Reference or SRO Objective:** 55.43(b)(5)

Knowledge of EOP implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, and severe accident management guidelines.

STP Lesson: LOT 504.04 **Objective Number:** 92284

STATE the conditions, in accordance with 0POP01-ZA-0018, that the CSFs would be monitored but the FRPs not implemented.

Reference: LOT 504.04 Lesson Plan PPT and 0POP04-ZO-0001, Control Room Evacuation

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified From**

Distractor Justification

A: INCORRECT: This distractor is credible because a SGTR is in progress and is time critical to get certain actions completed. However, the control room evacuation takes priority because of the fire in the relay room causing spurious operation of equipment.

B: INCORRECT: This distractor is credible because a loss of all AC has now occurred but the control room evacuation takes priority because control of ESF DG #13 can be regained locally.

C: INCORRECT: This distractor is credible because safe shutdown fire response is important but for this condition the safe shutdown fire response is covered by 0POP04-ZO-0001, Control Room Evacuation.

D: CORRECT: In this case 0POP04-ZO-0001, Control Room Evacuation does take priority because the fire in the relay room is causing spurious equipment operation.

Question Level: H **Question Difficulty** 3

Justification:

The student must be able to evaluate the given conditions and determine the correct procedure to use.

Exam Bank No.: 2295 **Last used on an NRC exam:** Never

SRO Sequence Number: 99

Given the following:

- Unit 1 is in Mode 6 with refueling activities in progress.
- A Spent Fuel assembly being lowered into the RCB Upender dropped the last foot of travel due to failure of the gripper.
- Small gas bubbles are seen rising to the water surface above the RCB Upender.

Which of the following correctly describes the personal monitoring equipment that will alert the Fuel Handlers of the rising radiation levels and the primary radiation hazard to the Fuel Handlers due to the radiation released?

	Personnel Monitoring Equipment	**Primary Radiation Hazard**
A.	Thermoluminescent Dosimeter (TLD)	Krypton Gas
B.	Thermoluminescent Dosimeter (TLD)	Cobalt 60
C.	Electronic Personal Dosimeter (EPD)	Krypton Gas
D.	Electronic Personal Dosimeter (EPD)	Cobalt 60

Answer: C Electronic Personal Dosimeter (EPD -)Krypton Gas

Exam Bank No.: 2295

K/A Catalog Number: G2.3.15 **Tier:** 3 **Group/Category:**

SRO Importance: 3.1 **10CFR Reference or SRO Objective:** 55.43(b)(4)

Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personal monitoring equipment, 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: 0PGP03-ZR-0051, Radiological Access Controls/Standards

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified From**

Distractor Justification

A: INCORRECT: This distractor is credible because a TLD is required to be worn but it does not give an alarm or any other indication of a high dose or dose rate.

B: INCORRECT: This distractor is credible because a TLD is required to be worn but it does not give an alarm or any other indication of a high dose or dose rate. Also, Cobalt 60 is a fission product that could be released by a damaged fuel assembly but it would be in the form of a particle that would not float to the surface of the water like a gas would.

C: CORRECT: The EPD will give an audible alarm on a set dose and a set dose rate. Krypton Gas floating to the surface of the water form the damaged fuel assembly would be the radiological hazard.

D: INCORRECT: This distractor is credible because Cobalt 60 is a fission product that could be released by a damaged fuel assembly but it would be in the form of a particle that would not float to the surface of the water like a gas would.

Question Level: F **Question Difficulty** 3

Justification:

This student must have knowledge of personal radiation monitoring devices work and knowledge of potential radiation hazards.

Exam Bank No.: 2285 **Last used on an NRC exam:** Never

SRO Sequence Number: 100

Given the following:

- Unit 1 experienced a Small Break Loss of Coolant Accident (SBLOCA).
- The Control Room has just entered 0POP05-EO-ES12, Post LOCA Cooldown and Depressurization.
- Unit 1 Emergency Action Level is currently at the ALERT level.
- All E-Plan Facilities are now activated.

Which TWO of the following Facility Leaders can the Shift Manager turn over Emergency Director Duties?

1. Joint Information Center Director
2. Emergency Operations Facility Director
3. Technical Support Center Manager
4. Operations Support Center Coordinator

A. 1 and 2

B. 2 and 3

C. 3 and 4

D. 1 and 4

Answer: B 2 and 3

Exam Bank No.: 2285

K/A Catalog Number: W/E03 G2.4.37 **Tier:** 1 **Group/Category:** 2

SRO Importance: 4.1 **10CFR Reference or SRO Objective:** Objective SRO-65180

Knowledge of the line of authority during implementation of the emergency plan.

STP Lesson: LOT 803.14 **Objective Number:** SRO-65180

Given a description of responsibilities related to an ERO position that interfaces with the Emergency Director DETERMINE the responsible individual.

Reference: LOT 803.14 Lesson Plan on Emergency Director's Responsibilities

Attached Reference ☐ **Attachment:**

NRC Reference Req'd ☐ **Attachment:**

Source: New **Modified From**

Distractor Justification

A: INCORRECT: This distractor is credible because the OSC is activated but the leader of this facility does not act as the Emergency Director.

B: CORRECT: When activated, the Emergency Response Organization has 4 facilities that are manned at the ALERT level and above. The 4 facilities are the OSC, TSC, EOF and JIC. Each facility has a leader but only two can be Emergency Directors. The EOF Director and the TSC Manager.

C: INCORRECT: This distractor is credible because the JIC is activated but the leader of this facility does not act as the Emergency Director.

D: INCORRECT: This distractor is credible because the JIC and OSC are activated but the leaders of these facilities does not act as the Emergency Director.

Question Level: F **Question Difficulty** 3

Justification:

The student must have knowledge of responsibilities of and interfaces with the Emergency Director.

LOT 19.1 NRC Exam

SRO

Reference

Package

RECOGNITION CATEGORY F
FISSION PRODUCT BARRIER DEGRADATION
INITIATING CONDITION MATRIX

Determine which combination of the three barriers are lost or have a potential loss and use the following matrix to classify the event. Also, an event (or multiple events) could occur which result in the conclusion that the loss or potential loss is IMMINENT (within 1 to 2 hours). In this IMMINENT loss situation use judgment and classify as if the thresholds are exceeded.

UNUSUAL EVENT (1-2)	ALERT (3-4)	SITE AREA EMERGENCY (5-8)	GENERAL EMERGENCY (9-10)
FU1 ANY Loss or ANY Potential Loss of Containment **FU2** Fuel Clad Degradation See SU6 **FU3** RCS Leakage - See SU7	**FA1** ANY Loss or ANY Potential Loss of Fuel Clad or RCS	**FS1** Loss of BOTH Fuel Clad and RCS OR Potential Loss of BOTH Fuel Clad and RCS **OR** Potential Loss of EITHER Fuel Clad or RCS **AND** Loss of ANY Additional Barrier	**FG1** Loss of ANY Two Barriers AND Potential Loss or Loss of Third Barrier

Operating Modes 1 through 4

Note: 1. At the Site Area Emergency level, there must be some ability to dynamically assess how far present conditions are from General Emergency.

2. The ability to escalate to higher emergency classes as an event degrades must be maintained. RCS leakage steadily increasing would represent an increasing risk to public health and safety.

Determination of Emergency Classification Level

Select values from the top of the columns on the next page, which describe specific Fission Product Barrier degradation. Select the higher value that applies from each barrier. Add the values to arrive at the total challenge to the Fission Product Barriers. The emergency classification is determined from the range of values shown in parentheses in the table above.

RECOGNITION CATEGORY F
FISSION PRODUCT BARRIER DEGRADATION
INITIATING CONDITION MATRIX

EAL	FUEL CLAD		RCS		CONTAINMENT	
	POTENTIAL LOSS (3)	LOSS (4)	POTENTIAL LOSS (3)	LOSS (4)	POTENTIAL LOSS (1)	LOSS (2)
1	CSF Core Cooling - Orange **OR** Heat Sink - Red[2]	CSF Core Cooling - Red	CSF RCS Integrity – Red **OR** Heat Sink - Red[2]	CSF Core Cooling - Yellow with subcooling < 0 °F	CSF Containment - Red **OR** Core Cooling - Orange > 15 min.	—
2	RCS Activity Failed Fuel Monitor, RT-8039, equal to or greater than 870 µCi/ml	RCS Activity Dose Equivalent Iodine greater than 300 µCi/gm	RCS Leak Rate Unisolable leak exceeding the capacity of one centrifugal charging pump in the normal charging mode.	RCS Leak Rate Leak rate greater than CVCS System's ability to maintain RCS inventory as indicated by loss of RCS subcooling.	Containment Pressure Greater than 6% hydrogen concentration in containment **OR** Containment pressure greater than 9.5 psig with neither containment spray nor RCFC running.	Containment Pressure Initial increase followed by rapid unexplained decrease **OR** Containment pressure or sump level not increasing as expected with LOCA conditions.
3	Core Exit Thermocouple ≥ 708°F	Core Exit Thermocouple 1200°F	SG Tube Rupture SG Tube has ruptured and the primary to secondary leak rate is greater than the capacity of one centrifugal charging pump.	SG Tube Rupture SG Tube is ruptured and has a non-isolable secondary steam release	—	SG Tube Leak Primary to secondary leakage greater than 150 gpd through any one steam generator with direct secondary side leakage to atmosphere
4	Reactor Vessel Water Level Plenum level less then 20%	—	—	—	Containment Bypass VALID increase in reading on area or ventilation monitors in areas adjacent to the containment boundary with a known LOCA inside containment.	Containment Isolation Containment isolation signal **AND** Valves not closed **AND** A pathway to the environment exists.
5	—	RCB Rad Monitor RT-8050 or RT-8051 greater than 100 R/hr **OR** Hatch Monitor greater than 222 mR/hr	—	RCB Rad Monitor RT-8050 or RT-8051 greater than 100 R/hr **OR** Hatch Monitor greater than 222 mR/hr	RCB Rad Monitor RT-8050 or RT-8051 greater than 1,000 R/hr **OR** Hatch Monitor greater than 2,222 mR/hr	—

Note: 1. The Fuel Clad barrier and the RCS barrier are weighted more heavily than the Containment Barrier. Unusual Event Initiating Conditions (ICs) associated with RCS and Fuel Clad barriers are addressed under SU6 and SU7.

2. CSF indicators must be valid; outside the immediate control of the operator.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

- **IF any SG(s) are faulted OR INACTIVE THEN DO NOT transition to 0POP05-EO-ES03, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL.**
- **IF it is determined that a natural circulation cooldown and depressurization must be performed at a rate that may form a steam void in the vessel, THEN 0POP05-EO-ES03, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL, should be used.**

___16 **INITIATE RCS Depressurization:**

___a. CHECK CRDM vent fans - AT LEAST TWO RUNNING

a. PERFORM the following:

1) ESTABLISH RCS subcooling based on core exit T/Cs GREATER THAN 100°F per ADDENDUM 2, COOLDOWN CURVE WITH LESS THAN TWO CRDM VENT FANS RUNNING.

2) MAINTAIN upper head subcooling GREATER THAN 10°F per ADDENDUM 3, UPPER HEAD SUBCOOLING CURVE (Plant Computer display RC-12/8112).

Step 16 continued on next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

Step 16 continued from previous page.

3) IF upper head subcooling LESS THAN 10°F, THEN:

a) OPEN reactor vessel head vent isolation valves.

b) OPEN reactor vessel head vent throttle valve in one vent path.

c) MAINTAIN pressurizer level BETWEEN 23% AND 33% by controlling charging flow.

d) WHEN upper head subcooling GREATER THAN 20°F, THEN PERFORM the following:

1) Close all reactor vessel head vent throttle valves.

2) Close all reactor vessel head vent isolation valves.

4) GO TO Step 16.c.

___b. MAINTAIN RCS subcooling based on core exit T/Cs - GREATER THAN 85°F

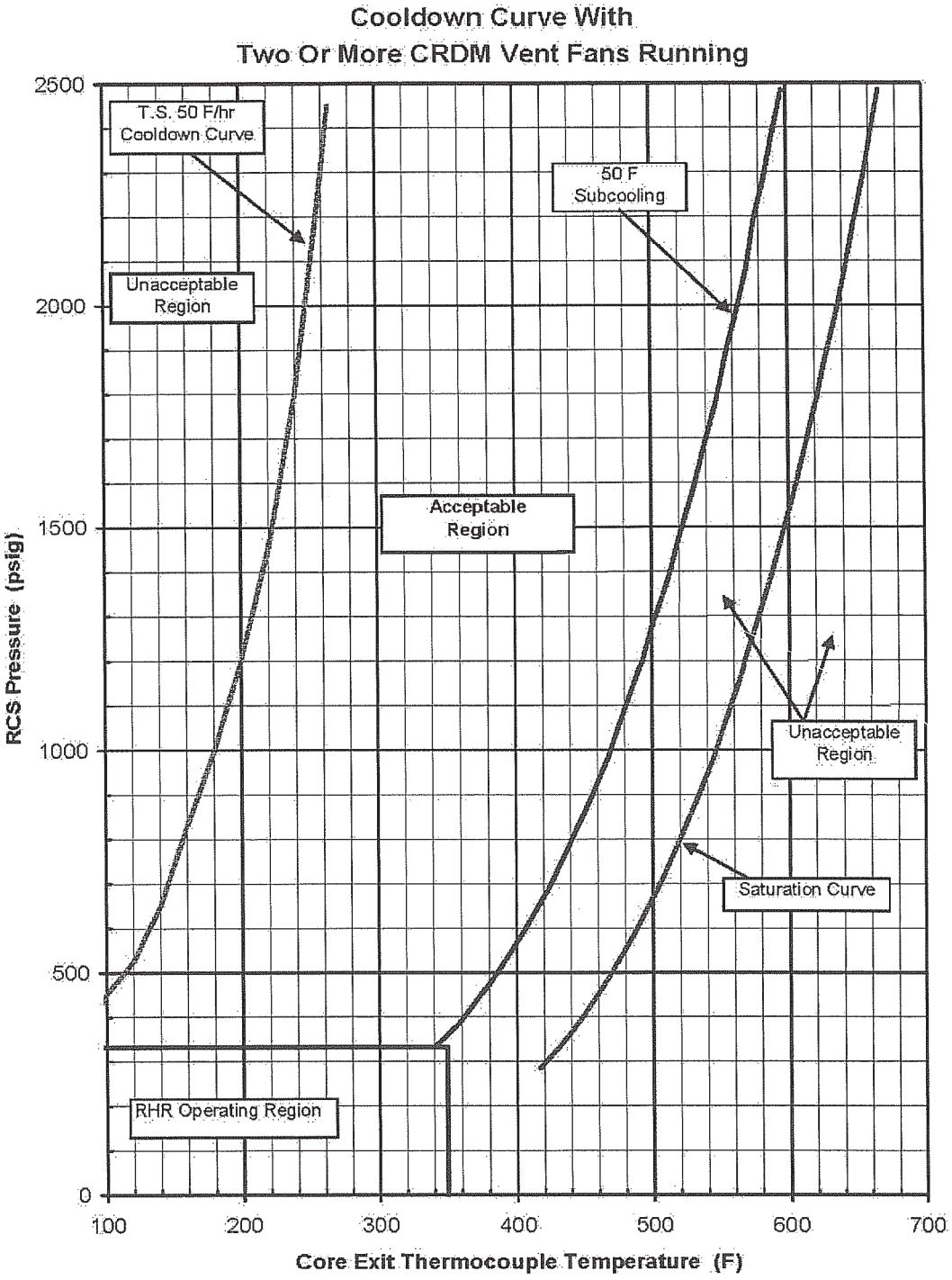
___c. CHECK auxiliary spray in service

c. ENSURE normal spray valve - CLOSED

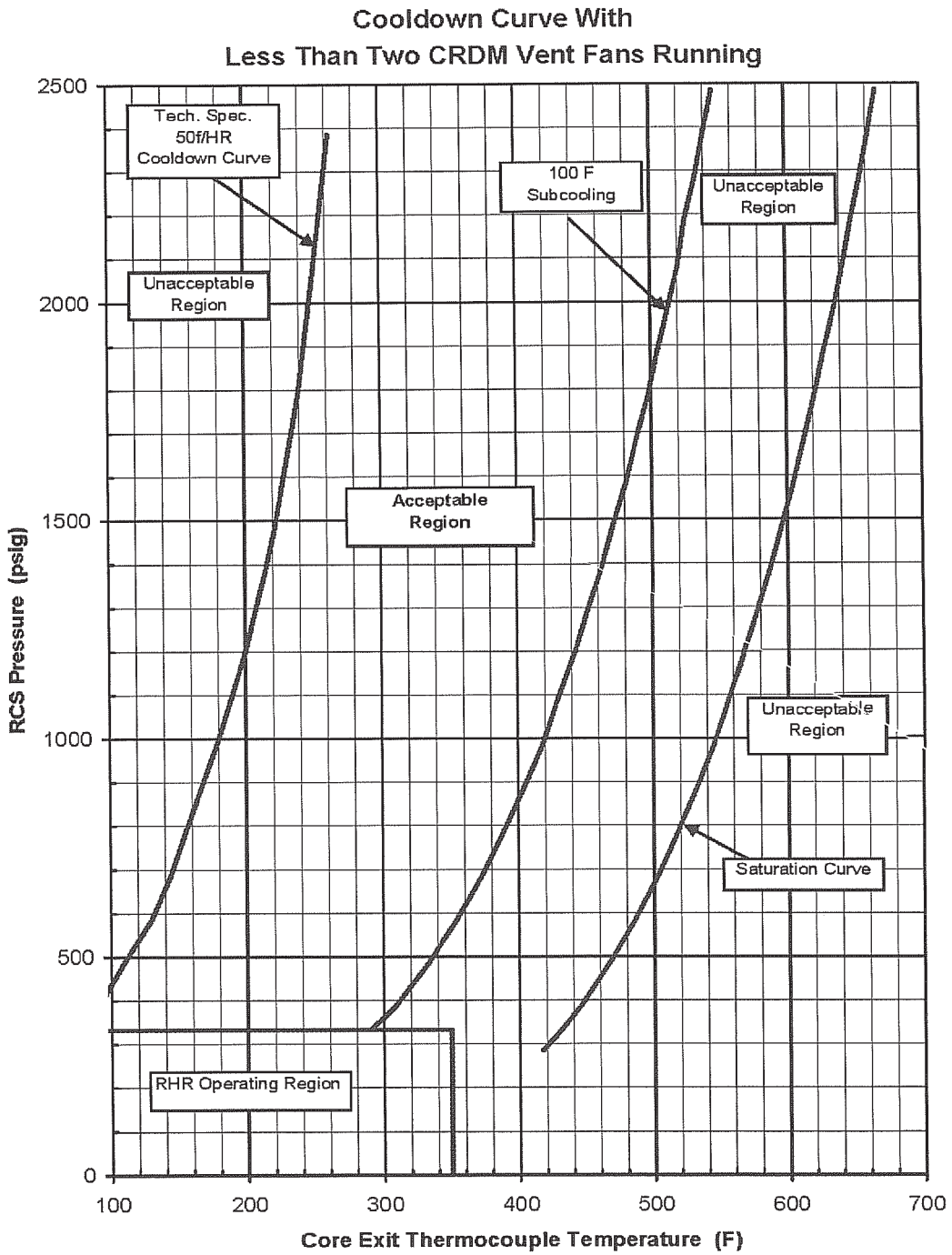
___d. USE auxiliary spray

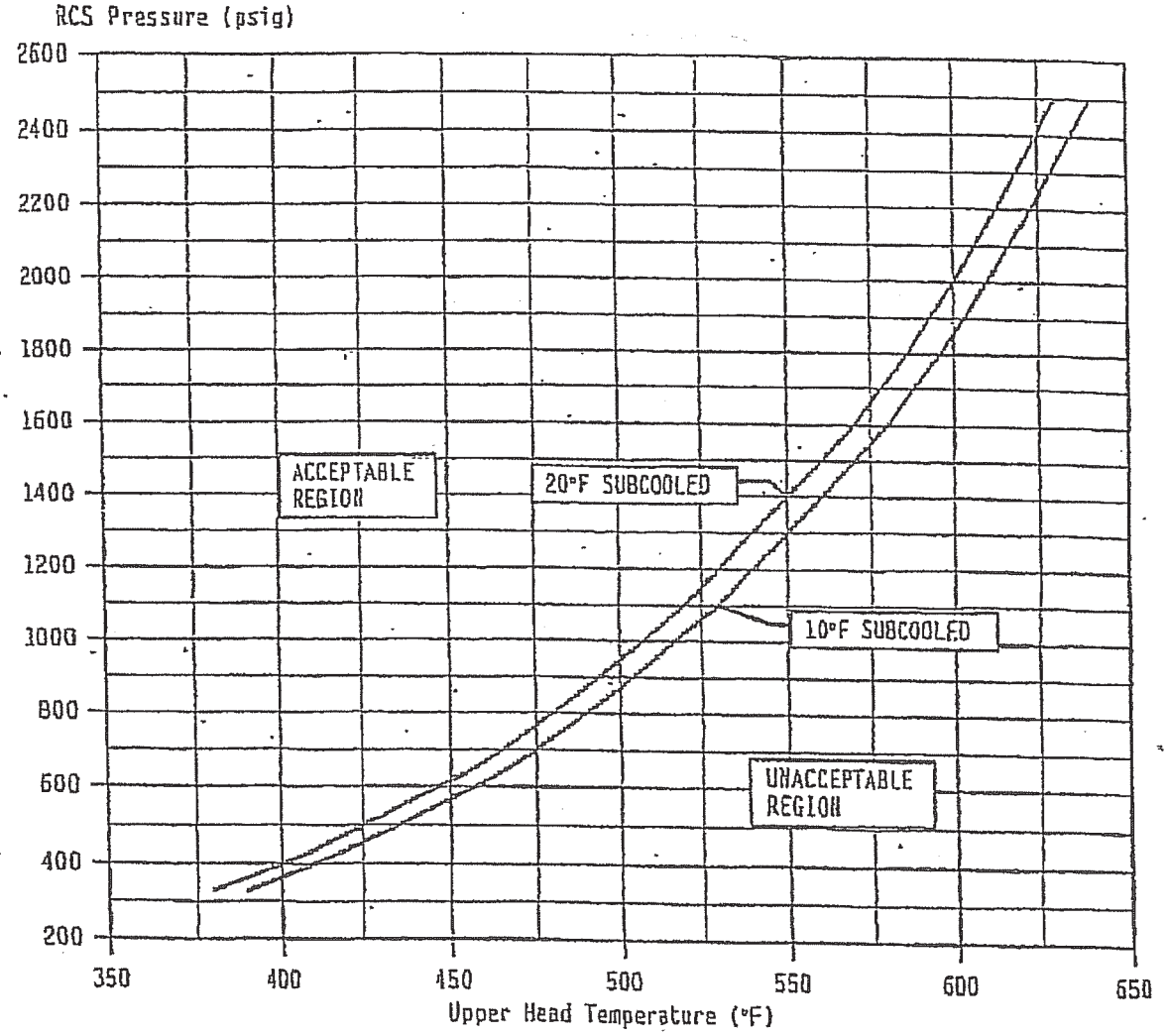
d. USE one pressurizer PORV.

ADDENDUM 1
COOLDOWN CURVE WITH TWO OR MORE CRDM VENT FANS RUNNING



ADDENDUM 2
COOLDOWN CURVE WITH LESS THAN TWO CRDM VENT FANS RUNNING



ADDENDUM 3
UPPER HEAD SUBCOOLING CURVE

Upper Head Subcooling Curve