

## Question Topic

RO 1

Given the following conditions:

- Unit 2 is operating at 100% power.
- A degraded stator water cooling system condition causes a Main Generator Stator Water runback to occur.
- The runback terminates at 80% power when the initiating signal clears.
- During the runback, the RO reported 2 control bank D rods have stopped moving at 215 steps.
- The CRS entered S2.OP-AB.ROD-0001, Immovable / Misaligned Control Rods, and rod control is placed in manual.
- Control Bank D Group Demand is 185 steps.
- A Rx trip is not required.

Which of the following identifies how the crew will proceed?

Assume the 2 inoperable control rods will NOT be restored to operable status, and the remaining control rods will NOT be realigned to the inoperable rods.

- a. Place the unit in Hot Standby.
- b. Place the unit in Hot Shutdown.
- c. Reduce power to <50%, power operation at up to 50% may continue.
- d. Reduce power to less than 75%, power operation at up to 75% may continue.

Answer: a Exam Level: R Cognitive Level: Application Facility: Salem 1 & 2 Exam Date: 12/15/2014

KA: 000005A203 AA2.03 RO Value: 3.5 SRO Value: 4.4 Section: EPE RO Group: 2 SRO Group: 2 55.43 ✓

System/Evolution Title: Inoperable/Stuck Control Rod 005

KA Statement: Ability to determine and interpret the following as they apply to Inoperable/Stuck Control Rod:

Required actions if more than one rod is stuck or inoperable

**Explanation of Answers:** 55.41.b(10) With more than one rod misaligned, the crew is directed to place the unit in Hot Standby at step 3.37 of AB.ROD-1. This is derived from TSAS 3.1.3.1 action b, which states that with more than one rod inoperable or misaligned from its associated group step counter demand position by more than 18 steps <85% power, be in Hot Standby within 6 hours. The question is RO appropriate since it does not ask for the 6 hour time frame, rather it is asking for knowledge of a procedure step which requires HSB if 2 or more rods are affected. The 75% distracter is the action for a single inoperable rod, the 50% distracter is plausible because <50% power there are other rod induced problems which do not apply, i.e., AFD and QPTR TS are only applicable >50% power

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Immovable / Misaligned Control Rods	S2.OP-AB.ROD-0001			8
Salem Tech Specs		3.1.3.1	3/4 1-13	

## L.O. Number

ABROD1E001

## Objectives

Material Required for Examination

Question Source:

New

Question Location:

Method:

Used during training by team

Question Source Comments

Comment

Given the following conditions:

- Unit 2 was responding to a SGFP trip from 100% power at EOL.
- 22 SG NR level reached 16% and continued to drop.
- IAW S2.OP-AB-CN-0001, Main Feedwater / Condensate System Abnormality, the CRS directed the RO to trip the Rx.
- The RO turned the Rx Trip Handle on 2CC2 and performed the immediate actions of EOP-TRIP-1.

When reporting his review of the OHA's prior to the first shift brief in the EOP's, the RO reports the following "F" Window alarms are locked in:

F-3 21 SG LVL LO-LO  
F-11 22 SG LVL LO-LO  
F-19 23 SG LVL LO-LO  
F-27 24 SG LVL LO-LO  
F-36 TRB TRIP & P-9  
F-44 MAN RX TRIP INITIATED

The F-11 OHA is red, while all the others are white.

Which of the following describes the information provided by the "F" OHA Window Boxes?

The first Rx trip signal was...

- a. LO-LO SG NR level. An ATWT has occurred.
- b. the manual Rx trip. The F-36 window indicates the Main Turb failed to automatically trip.
- c. the manual Rx trip. The red box only indicates the first automatically generated Reactor Protection System trip.
- d. LO-LO SG NR level. Only a review of the Sequence of Events Recorder can determine whether or not an ATWT has occurred.

Answer: d Exam Level: R Cognitive Level: Application Facility: Salem 1 & 2 Exam Date: 12/15/2014

KA: 000007A205 EA2.05 RO Value: 3.4 SRO Value: 3.9 Section: EPE RO Group: 1 SRO Group: 1 55.43 ✓

System/Evolution Title: Reactor Trip 007

KA Statement: Ability to determine and interpret the following as they apply to Reactor Trip:  
Reactor trip first-out indication

Explanation of Answers: 55.41.b(7) The "F" windows have dual backlights, red and white. The first signal to be generated to trip the Rx is locked in RED, and can only be reset with a keyswitch and SM permission. In the above condition, the time it took to order and carry out the manual Rx trip was sufficient to allow SG NR level to lower past the auto trip setpoint of 14%. Since a manual trip was ordered but an auto trip occurred, the SER must be reviewed quickly to determine which signal was sent to the RPS system first; a manual trip or auto trip. This information is provided on a computer on Control Console 2CC1. B is incorrect because the RED box indicates an auto trip occurred before the manual trip, while the F-36 does indicate the turbine tripped before the Rx. C is incorrect because of B above AND because the RED box is the first TRIP signal, not the first AUTO TRIP signal. occurred as the Rx was tripped though the second part would be correct if it was thought that a manual trip occurred first. A is incorrect because an ATWT may or may not have occurred, and D is more correct because the SER must be reviewed to determine if the manual trip was initiated before the auto trip occurred.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Overhead Annunciator Window F	S2.OP-AR.ZZ-0006			16
Overhead Annunciator System	NOS05ANN00-06		41	6

L.O. Number

Objectives

OHA000E008

Material Required for Examination		
Question Source:	New	Question Modification Method:
		Used During Training Program
Question Source Comments		
Comment		

Question Topic RO 3

Given the following conditions:

- Unit 2 is operating normally at 100% power when one PZR safety valve fails open.
- All plant systems respond as designed.

Which of the following identifies how PZR level will respond after the Rx is tripped?

PZR level will lower initially, then...

- a. rise rapidly until the PZR becomes water solid.
- b. rise very slowly until the PZR becomes water solid.
- c. lower rapidly until the PZR empties and remains empty.
- d. lower very slowly until the PZR empties and remains empty.

Answer a Exam Level R Cognitive Level Memory Facility: Salem 1 &amp; 2 Exam Date: 12/15/2014

KA: 000008A106 AA1.06 RO Value: 3.6 SRO Value: 3.6 Section: EPE RO Group: 1 SRO Group: 1 55.43 ☐

System/Evolution Title Pressurizer Vapor Space Accident 008

KA Statement: Ability to operate and / or monitor the following as they apply to Pressurizer Vapor Space Accident:  
Control of PZR level

Explanation of Answers: 55.41.b(5,7,14) A characteristic of a vapor space accident is that pressure and level will initially lower, then as the RPV begins to void, level will rapidly rise in the PZR, whereas a LOCA would lose pressure and level.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision

L.O. Number

Objectives

CVCS00E008

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Significantly Modified Used During Training Program ☐

Question Source Comments Q57432 changed from why level rises rapidly to what does level do

Comment

Question Topic RO 4

Complete the following statement:

EOP-LOCA-4, Transfer to Hot Leg Recirculation, is performed when directed during the response to a Large Break LOCA to...

- a. ensure voids which may have developed in the downcomer/annulus region of the reactor vessel are dissipated.
- b. prevent thermal gradients across the upper vessel from becoming fissures which could divert recirculation flow from the core.
- c. ensure boron does not concentrate in the reactor vessel (due to boil off) to the point of solidification and blockage of coolant channels.
- d. prevent thermal stratification of the fluid in the core which would add to the assumed 1% fuel damage which has already occurred and is accounted for in the accident analysis.

Answer c Exam Level R Cognitive Level Memory Facility: Salem 1 &amp; 2 ExamDate: 12/15/2014

KA: 000011K312 EK3.12 RO Value: 4.4 SRO Value: 4.6 Section: EPE RO Group: 1 SRO Group: 1 55.43 ✓

System/Evolution Title Large Break LOCA 011

KA Statement: Knowledge of the reasons for the following responses as they apply to Large Break LOCA:  
Actions contained in EOP for emergency LOCA (large break)

Explanation of Answers: 55.41.b(2,10) Salem UFSAR, Section 15, Accident Analysis for Condition IV - Limiting Faults, page 15.4-2b states..."Approximately 14 hours (Unit 1) and 6.5 hours (Unit 2) after initiation of the LOCA, the RHR and Intermediate Head Safety Injection pumps are realigned to supply water to the RCS hot legs in order to control the boric acid concentration in the reactor vessel." Additionally, EOP-LOCA-1, Loss of Reactor Coolant, step 28, directs the operator to perform EOP-LOCA-4. The bases for this step is based on the time after which boric acid concentrations could approach the solubility limit in the reactor vessel/core region following a double ended guillotine cold leg break.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Reactor Coolant	2-EOP-LOCA-1	Basis Document	51	28
Salem FSAR		15	15.4-2b	24
ECCS Lesson Plan	NOS05ECCS00-07		20	7

L.O. Number

Objectives

LOCA01E010

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Concept Used Used During Training Program ☐

Question Source Comments

Comment

RO SkyScraper

SRO SkyScraper

RO System Evolution List

SRO System Evolution List

Outline Changes

Question Topic: RO 5

Which of the following is an unexpected control room indication / alarm if a RCP thermal barrier rupture occurs?

- a. Component Cooling surge tank level lowering.
- b. 2CC131 Thermal Barrier Return Valve, indicates closed in AUTO.
- c. Rising activity or alarm on 2R17A or 2R17B, Component Cooling Radiation Monitor.
- d. RCP Thermal Barrier DISCHARGE FLOW HI console alarm will annunciate then clear shortly afterward.

Answer: a Exam Level: R Cognitive Level: Comprehension Facility: Salem 1 &amp; 2 Exam Date: 12/15/2014

KA: 000015K208 AK2.08 RO Value: 2.6 SRO Value: 2.6 Section: EPE RO Group: 1 SRO Group: 1 55.43

System/Evolution Title: Reactor Coolant Pump Malfunctions 015

KA Statement: Knowledge of the interrelations between Reactor Coolant Pump Malfunctions and the following:  
CCWS

Explanation of Answers: 55.41.b(3,7) The high flow alarm would come in as reactor coolant flows into the thermal barrier CCW system. This increased flow would cause a momentary hi flow alarm, then the CC131 return valve would auto shut on high flow. The RCS flow into the CCW system would be seen on the CCW surge tank rad monitors R17A and B. CC surge tank would RISE, not lower.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Reactor Coolant Pump Abnormality	S2.OP-AB.RCP-0001			21
Component Cooling System Simplified	205331-SIMP			0

L.O. Number

Objectives

ABRCP1E005

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Editorially Modified Used During Training Program

Question Source Comments: Q44499. Changed from a "NOT" question to an "what would be unexpected" stem.

Comment

Question Title RO

Given the following conditions:

- Unit 2 was operating at 100% power when 23 Charging Pump tripped.
- Operators entered S2.OP-AB.CVC-0001, Loss of Charging.

Which of the following identifies an action which must be performed prior to starting a charging pump, and why?

- a. Check RCP seal inlet temperature <225°F to prevent damage to seals when CVCS flow is restored.
- b. Check VCT pressure > 20 psig to ensure adequate NPSH is available to the charging pump being started.
- c. Shut 2CV55, Charging Flow Control Valve, to prevent water hammer on the Regenerative Heat Exchanger.
- d. Open 2CV71 Charging Header Pressure Control Valve, to prevent seal injection flow from being re-established > Tech Spec limit of 40 gpm total to all RCPs.

Answer a Exam Level R Cognitive Level Memory Facility: Salem 1 &amp; 2 ExamDate: 12/15/2014

KA: 000022K101 AK1.01 RO Value: 2.8 SRO Value: 3.2 Section: EPE RO Group: 1 SRO Group: 1 55.43

System/Evolution Title Loss of Reactor Coolant Makeup 022

KA Statement: Knowledge of the operational implications of the following concepts as they apply to Loss of Reactor Coolant Makeup:  
Consequences of thermal shock to RCP seals

Explanation of Answers: 55.41.b(10) AB.CVC-1 states to check RCP seal inlet temp <225 OR seal injection isolated. Seal isolation is not one of the available choices. The bases for AB.CVC-1 says this is done using LOPA-1 as guidance. LOPA-1 bases doc says that seals are isolated (because in LOPA you have additionally lost all CCW flow and seals HAVE heated up) to protect RCPs from seal and shaft damage that may occur when a centrifugal charging pump is started. While VCT is the source of NPSH to the CVCS pumps, it is automatically maintained 15-25 psig and is not checked. 2CV55 is shut prior to starting the centrifugal charging pump, but that is to prevent excessive flow, and the CV55 is normally full open at power. The CV71 is not adjusted until after the CVCS pump is started, but the reason is correct.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Charging	S2.OP-AB.CVC-0001	Bases Doc	2	9
Loss of all AC power	2-EOP-LOPA-1	Bases Doc	34	27

L.O. Number

ABCVC1E002

Objectives

Material Required for Examination

Question Source: New Question Modification Method: Used During Training Program

Question Source Comments

Comment

Question Topic RO 7

Which of the following describes the relationship between the position of the 2CV175, Rapid Borate Stop Valve, and the establishment of Rapid Boration flow?

IAW S2.OP-SO.CVC-0008 Rapid Boration, Rapid boration can...

- a. NOT be established with the 2CV175 shut.
- b. be established with the 2CV175 shut by only opening the 2SJ1 OR 2SJ2 RWST to Charging Pumps Stop valves.
- c. be established with the 2CV175 shut by opening the 2CV174 Blender Bypass valve and opening the 2CV172 Boric Acid Flow to Blender valve.
- d. be established with the 2CV175 shut by aligning the CVCS Makeup System controls for a normal boration and fully opening 2CV172.

Answer c Exam Level R Cognitive Level Application Facility: Salem 1 & 2 ExamDate: 12/15/2014

KA: 000024K201 AK2.01 RO Value: 2.7 SRO Value: 2.7 Section: EPE RO Group: 2 SRO Group: 2 55.43

System/Evolution Title Emergency Boration 024

KA Statement: Knowledge of the interrelations between Emergency Boration and the following:  
Valves

Explanation of Answers: 55.41.b(6) Using the 2CV175 to establish rapid boration is the most direct way. However, with closed, there are 3 other ways IAW S2.OP-SO.CVC-0006 in which Rapid Boration can be established. B is incorrect because the 2CV40 or 41 VCT outlet valves are required to be shut, otherwise the RWST water will not have enough head to be sucked into the charging pump suction, with ~20-30 psig in the VCT. C is correct because the flowpath from the BAT pumps through the 2CV172 and the 174 will establish flow. D is incorrect because a manual lineup is performed to ensure the valves required to be opened. 2CV172 and 2CV185 remain open.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Rapid Boration	S2.OP-SO.CVC-0008			6

L.O. Number

CVCS00E013

Objectives

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Concept Used Used During Training Program

Question Source Comments: Q80475.

Comment

Question Topic: RO 8

Given the following conditions:

- Unit 2 was in MODE 4 with 21 RHR loop providing shutdown cooling, and 22 RHR loop aligned for ECCS.
- 21 RHR pump began cavitating due to a valve being mispositioned during a tagging release.
- The CRS entered S2.OP-AB.RHR-0001, Loss of RHR, and stopped 21 RHR pump.
- Plant conditions allowed time for normal restoration and local venting of the RHR System.

Which of the following describes the preferred flow rate when starting the RHR pump, and why?

- a. Higher flow rate to sweep entrained air from system.
- b. Lower flow rate to prevent high starting current on the RHR pump.
- c. Higher flow rate to quickly terminate the temperature rise in the RCS.
- d. Lower flow rate to limit initial sudden cooldown and to minimize level loss caused by collapsing voids.

Answer: d Exam Level: R Cognitive Level: Memory Facility: Salem 1 &amp; 2 Exam Date: 12/15/2014

KA: 000025K202 AK2.02 RO Value: 3.2\* SRO Value: 3.2 Section: EPE RO Group: 1 SRO Group: 1 55.43

System/Evolution Title: Loss of Residual Heat Removal System 025

KA Statement: Knowledge of the interrelations between Loss of Residual Heat Removal System and the following:  
LPI or Decay Heat Removal/RHR pumps

Explanation of Answers: 55.41.b(10) The preferred rate is a lower flow. The CAUTION on page 10 states that it is for the reason as stated in the correct choice above. Higher flow rate to sweep entrained air is the method used when time does NOT allow a normal venting as described in the stem. (CAUTION PAGE 14)

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of RHR	S2.OP-AB.RHR-0001			18

L.O. Number

Objectives

ABRHR1E004

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Direct From Source Used During Training Program ☐

Question Source Comments: Q120590 (used on 8/2008 RO NRC exam, 4 NRC exams ago.)

Comment

RO SkyScraper

SRO SkyScraper

RO System/Evolution List

SRO System/Evolution List

Outline Changes

Question Topic RO 9

Given the following conditions:

- Unit 2 is at operating normally at 100% power.
- A Component Cooling Water leak results in entry into S2.OP-AB.CC-0001, Component Cooling Abnormality.
- Make-up can maintain CC surge tank level > 38%
- The crew has implemented ATTACHMENT 4, Leak Isolation Method.
- When make-up is stopped, surge tank level lowers with either CC header in service.

Of the following, which is the only component that could be leaking to cause these indications?

- a. 22 CCW HX.
- b. Spent Fuel Pool HX.
- c. 23 Charging pump mechanical seal HX.
- d. Boric Acid Evaporator Distillate Cooler HX.

Answer b Exam Level R Cognitive Level Application Facility: Salem 1 &amp; 2 ExamDate: 12/15/2014

KA: 000026A102 AA1.02 RO Value: 3.2 SRO Value: 3.3 Section: EPE RO Group: 1 SRO Group: 1 55.43

System/Evolution Title Loss of Component Cooling Water 026

KA Statement: Ability to operate and / or monitor the following as they apply to Loss of Component Cooling Water:  
Loads on the CCWS in the control room

**Explanation of Answers:** 55.41.b(4) With the stem stating that the leak continues with EITHER CC header in service, that means the leak must be on the Non-Safeguards header, which is supplied from both CC headers. Of the 4 choices, 2 are on the safeguards header, and 2 are not. Of the 2 possible answers, the Boric Acid Distillate Cooler HX is not normally in service. That leaves the SFP HX, and SF cooling pressure is < CCW pressure, meaning the leak would be out of the CCW system. This question is different from Question 5 in that this question requires knowledge of system operation during performance of the AB to locate the leak, whereas Question 5 is a Thermal Barrier question.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Component Cooling System Abnormality	S2.OP-AB.CC-0001			14
Component Cooling System Simplified	205331-SIMP			0

L.O. Number

Objectives

ABCC01E004

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Concept Used Used During Training Program

Question Source Comments Q57732

Comment

Question Topic RO 10

Given the following conditions:

- Unit 2 is operating at 60% power.
- There is a power ascension in progress at a rate of 10%/hr.
- PZR Pressure Channel III, PT-457 is selected for CONTROL.

Which of the following describes RCS pressure response if PZR Pressure Channel III fails low with no operator action?

RCS pressure will rise until...

- a. ONE PZR PORV opens.
- b. BOTH PZR PORV's open.
- c. the PZR Spray Valves open.
- d. a PZR Code Safety Valve opens

Answer a Exam Level R Cognitive Level Application Facility: Salem 1 &amp; 2 ExamDate: 12/15/2014

KA: 000027K203 AK2.03 RO Value: 2.6 SRO Value: 2.8 Section: EPE RO Group: 1 SRO Group: 1 55.43 ☐

System/Evolution Title Pressurizer Pressure Control Malfunction 027

KA Statement: Knowledge of the interrelations between Pressurizer Pressure Control Malfunction and the following:  
Controllers and Positioners

Explanation of Answers: 55.41.b(7) The failure of the controlling PZR Pressure channel causes the Master Pressure Controller to sense a low pressure condition, and its output will go to zero. A 0% demand will cause all PZR heaters in auto to energize, and PZR Spray valves to shut. RCS pressure rises slowly but spray valves will not open because the MPC still sees a low pressure condition from the failed low PZR pressure channel. The PZR PORVs 2PR1 and 2PR2 are 2/2 coincidence required to open, from PZR pressure channels 1/3 and 2/4 respectively. Since Channel III is failed low, 2PR2 will not open. 2PR1 will open when channels I and III sense 2335 psig.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Pressurizer Pressure Control Malfunction	S2.OP-AB.PZR-0001			18
RPS PZR Pressure and Level Control	221060			7
PZR PORV Valves	231357			15

L.O. Number

Objectives

ABPZR1E001

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Editorially Modified Used During Training Program ☐

Question Source Comments Q80493

Comment

Question Topic RO 11

Given the following conditions:

- Unit 1 has experienced a RCS leak while operating at 40% power.
- The crew is responding IAW S1.OP-AB.RC-0001, Reactor Coolant System Leak.
- As conditions continue to degrade without an automatic or manual Rx trip, which of the following identifies a condition where an ATWT is present and a manual Rx trip is required?

a. RCS loop D/T is 25°F.

b. The Main Turbine has tripped.

c. PZR level is 16% and lowering.

d. PZR pressure is 1860 psig and lowering.

Answer d Exam Level R Cognitive Level Memory Facility: Salem 1 &amp; 2 ExamDate: 12/15/2014

KA: 000029G450 2.4.50 RO Value: 4.2 SRO Value: 4.0 Section: EPE RO Group: 1 SRO Group: 1 55.43

System/Evolution Title Anticipated Transient Without Scram

029

KA Statement:

Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.

Explanation of Answers: 55.41.b(7) A is incorrect because it is the normal value for loop D/T at 40% power. B is incorrect because with Rx power <P-9 (49%), a turbine trip does not initiate a Rx trip. C is incorrect because the 17% threshold for PZR level is heater isolation, not Rx trip. D is correct because the auto trip setpoint for PZR pressure is 1865 psig.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Licensed Operator Fluency List	NOS05FLUNCY-09			9

L.O. Number

Objectives

FLUNCYE002

Material Required for Examination

Question Source: New Question Modification Method: Used During Training Program

Question Source Comments

Comment

Question Topic

RO 12

Given the following conditions:

- Unit 2 is performing a Rx startup.
- Power is 1.0E3 cps.
- Source Range Nuclear Instrument (SRNI) Channel I (2N31) fails LOW.

Which of the following identifies why power must be maintained less than P-6 IAW Salem Tech Specs?

- a. SR/IR overlap at 3.0-5.0 E3 cps cannot be verified with only one SRNI.
- b. Permissive P-6 is will not energize when required with only a single SRNI channel.
- c. The ability to monitor Rx power on anything other than a one dimensional plane is lost.
- d. A single SR channel cannot be considered reliable with no other Rx power indication to verify it against.

Answer: d Exam Level: R Cognitive Level: Memory Facility: Salem 1 & 2 Exam Date: 12/15/2014

KA: 000032K301 AK3.01 RO Value: 3.2 SRO Value: 3.6 Section: EPE RO Group: 2 SRO Group: 2 55.43 ✓

System/Evolution Title Loss of Source Range Nuclear Instrumentation

032

KA Statement: Knowledge of the reasons for the following responses as they apply to Loss of Source Range Nuclear Instrumentation:  
Startup termination on source-range loss

Explanation of Answers: Below P-6, the SR and IR NIs may not be overlapped. This in actuality reduces Rx power indication to a single channel, and while adequate for shutdown monitoring, cannot be relied upon to provide Rx power indication when performing a startup. Tech Soec bases for 3.3.1.1 for Rx trip Instrumentation generalizes about all Rx trip and ESF instrumentation, but states that the maintaining operability is to..."2.) the specified coincidence logic and sufficient redundancy is maintained to permit a channel to be out of service for testing or maintenance consistent with maintaining an appropriate level of reliability of the Reactor Protection System 3.) sufficient system functional capability is available from diverse parameters."

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem Tech Spec Bases	3.3.1.1	Bases	3/4 3-1	282

L.O. Number

Objectives

EXCOREE012

Material Required for Examination

Question Source: New Question Modification Method: Used During Training Program ☐

Question Source Comments

Comment

RO SkyScraper

SRO SkyScraper

RO System/Evolution List

SRO System/Evolution List

Outline Changes

Question Title RO 13

During movement of irradiated fuel in the Spent Fuel Pit with the Rx in Mode 1, a Spent Fuel Assembly is not fully withdrawn from its rack before the Spent Fuel Crane is moved. The Spent Fuel Assembly is visibly damaged when the crane moves.

Which of the following conditions would require ALL personnel to evacuate the Fuel Handling Building IAW S2.OP-AB.FUEL-0001, Fuel Handling Incidents?

- a. Radiation level in the FHB reaches 1 R/hr.
- b. Spent Fuel Pool temperature reaches 130°F.
- c. Fuel Handling Crane motion locked out upon reaching Radiation Monitor 2R32A alarm setpoint.
- d. Automatic re-alignment of the Fuel Handling Building exhaust filter train to HEPA plus Charcoal has occurred.

Answer a Exam Level R Cognitive Level Memory Facility: Salem 1 & 2 ExamDate: 12/15/2014

KA: 000036K101 AK1.01 RO Value: 3.5 SRO Value: 4.1 Section: EPE RO Group: 2 SRO Group: 2 55.43

System/Evolution Title Fuel Handling Incidents 036

KA Statement: Knowledge of the operational implications of the following concepts as they apply to Fuel Handling Incidents:  
Radiation exposure hazards

Explanation of Answers: The R32A distracter is plausible if it is thought that because the crane can't be moved everyone should evacuate. AB.FUEL-1 CAS 1.0 states to evacuate at 1R/hr. Not LOD 1 because AB.FUEL-2 (Loss of Refueling Cavity or Spent Fuel Pool Level) don't evacuate FHB until 2R /hr. The 130°F distracter is a threshold in AB.SF-1 for loss of SFP cooling, but does not evacuate FHB, that would occur at 150°F. Ventilation Realignment is expected to occur either on high local rad level or manual actuation.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Fuel Handling Incident	S2.OP-AB.FUEL-0001			5

L.O. Number

Objectives

ABFUE2E002

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Concept Used Used During Training Program

Question Source Comments Q78657

Comment

Question Topic

RO 14

Which of the following describes when rising radiation levels on 2R19A, STM GEN BLOWDOWN RAD MONITOR, will automatically close the 21GB4, SG B/D OUTLET ISOL VALVE, and why?

2R19A in \_\_\_\_\_ will close the 21GB4 \_\_\_\_\_

- a. Warning, to prevent the spread of contamination from a Steam Generator Tube Rupture (SGTR) on 21 Steam Generator to secondary systems.
- b. Alarm, to prevent the spread of contamination from a Steam Generator Tube Rupture (SGTR) on 21 Steam Generator to secondary systems.
- c. Warning, to prevent backfeeding contamination from 21 Steam Generator to any other Steam Generator through the unaffected Steam Generators blowdown lines.
- d. Alarm, to prevent backfeeding contamination from 21 Steam Generator to any other Steam Generator through the unaffected Steam Generators blowdown lines.

Answer: **b** Exam Level: **R** Cognitive Level: **Memory** Facility: **Salem 1 & 2** Exam Date: **12/15/2014**

KA: **000038K303** EK3.03 RO Value: **3.6\*** SRO Value: **4.0** Section: **EPE** RO Group: **1** SRO Group: **1** **55.43** ☒

System/Evolution Title: **Steam Generator Tube Rupture**

**038**

KA Statement: **Knowledge of the reasons for the following responses as they apply to Steam Generator Tube Rupture:**

**Automatic actions associated with high radioactivity in S/G sample lines**

Explanation of Answers: **55.41.b(11) B is correct because isolating the blowdown path from the S/G to the condenser will prevent the spread of contamination, and also will prevent any type of release from the main condenser to atmosphere. A is incorrect because the auto closure occurs upon an Alarm signal, not warning. C and D are incorrect because the S/Gs each have its own blowdown line, so backfeeding contamination is not possible through the blowdown lines.**

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Radiation Monitoring Systems Operation	S2.OP-SO.RM-0001		20	38

L.O. Number

Objectives

ABSG01E001

Material Required for Examination

Question Source: **Facility Exam Bank** Question Modification Method: **Direct From Source** Used During Training Program ☐

Question Source Comments: **Q134429**

Comment

Question Topic RO 15

During an event in which a steamline rupture cause ALL SG's to blow down completely, why is AFW flow and steam release used to prevent the RCS from heating up?

RCS heatup will...

- a. result in a larger Delta-T between the AFW injection flow and the internal temperature of the SG J-tubes, which can cause water hammer in the feed ring when incoming AFW flashes to steam.
- b. cause PZR level to rise, which will repressurize the RCS. The severe cooling of the RPV downcomer combined with the pressure rise can cause a flaw in the vessel to propagate threatening the integrity of the vessel.
- c. result in a larger Delta-T between the ECCS injection water from the RWST and the RCS cold leg injection points, which can cause a flaw at the ECCS to cold leg piping weld to propagate threatening the integrity of the RCS.
- d. cause PZR level to rise which will repressurize the RCS. The thermal stress on the SG secondary side components from excessive heat transfer during the blowdown, combined with the pressure rise across the SG tubes can cause tubesheet deformation and leakage.

Answer b Exam Level R Cognitive Level Memory Facility: Salem 1 & 2 ExamDate: 12/15/2014

KA: 000040K101 AK1.01 RO Value: 4.1 SRO Value: 4.4 Section: EPE RO Group: 1 SRO Group: 1 55.43

System/Evolution Title Steam Line Rupture 040

KA Statement: Knowledge of the operational implications of the following concepts as they apply to Steam Line Rupture:  
Consequences of PTS

Explanation of Answers: 55.41.b(3,4) RCS heatup after a rapid cooldown/depressurization can result in a Pressurized Thermal Shock condition, as described on page 2 of FRTS-1 Basis Document. Distracter a is incorrect while it might be what happens, its not why the RCS is prevented from heating up, and the reason is loosely based on the Indian Point Feed Line water hammer event. Distracter c is incorrect because it is RPV failure that is a concern, not cold leg piping. Distracter D is incorrect because the pressure delta across the tubes is a concern when SG secondary depressurizes with a repressurization of primary side, not the tube sheet problem.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Response to Imminent Pressurized Thermal Sh	2-EOP-FRTS-1	Basis Doc	2	25

L.O. Number

Objectives

FRTS00E002

Material Required for Examination

Question Source: New Question Modification Method: Used During Training Program

Question Source Comments

Comment

Question To:

RO 16

Given the following conditions:

- Operators are recovering from a total loss of all AC power.
- While in 2-EOP-LOPA-1, Loss of All AC Power, 2B 4KV vital bus has been energized from off-site power.
- The crew has transitioned out of LOPA-1 to LOPA-2, Loss of All AC Power Recovery / SI Not Required.
- Safety injection was initiated as directed in LOPA-1, but is not required.

Which of the following describes how the listed equipment has, or will be, operated?

- a. 22 CCW pump was started as soon as a SW pump was started in LOPA-1.
- b. 21 Charging pump will be started after RCP seal return valve 2CV116 is shut.
- c. 21 Charging pump was started as soon as a SW pump was started in LOPA-1.
- d. 22 CCW pump will be started after Thermal Barrier return valve 2CC131 is shut.

Answer: **d** Exam Level: **R** Cognitive Level: **Memory** Facility: **Salem 1 & 2** Exam Date: **12/15/2014**

KA: **000055A107** EA1.07 RO Value: **4.3** SRO Value: **4.5** Section: **EPE** RO Group: **1** SRO Group: **1** **55-43**

System/Evolution Title: **Station Blackout** **055**

KA Statement: **Ability to operate and / or monitor the following as they apply to Station Blackout:**  
**Restoration of power from offsite**

Explanation of Answers: **55.41.b(10) A is incorrect due to not starting CCW pump until Thermal Barrier return is isolated. B is incorrect because seal return isolation is not the concern, seal injection to a hot RCP seal is. CVCS pump not started until RCP seal inlet is isolated.**

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of All AC Power	2-EOP-LOPA-1			27
Loss of All AC Power Recovery/SI Not Required	2-EOP-LOPA-2			22

L.O. Number

LOPA00E013

Objectives

Material Required for Examination

Question Source: **Facility Exam Bank** Question Modification Method: **Editorially Modified** Used During Training Program ☐

Question Source Comments: **Q148063 modified to include procedure transition in stem.**

Comment

Question Topic RO 17

Which of the following describes how a power reduction would be performed after a loss of the indicated Unit 2 115VAC Vital bus?

- a. A loss of 2A 115VAC Vital bus would require the use of boration only due to the loss of input to control rod speed and direction.
- b. A loss of 2B 115VAC Vital bus would require the use of manual rod insertion only due to the loss of CVCS totalizer function.
- c. A loss of 2C 115VAC Vital bus would require the use of manual rod insertion only due to the loss of CVCS totalizer function.
- d. A loss of 2D 115VAC Vital bus would require the use of boration only due to the loss of input to control rod speed and direction.

Answer d Exam Level R Cognitive Level Memory Facility: Salem 1 &amp; 2 ExamDate: 12/15/2014

KA: 000057K301 AK3.01 RO Value: 4.1 SRO Value: 4.4 Section: EPE RO Group: 1 SRO Group: 1 55.43 ✓

System/Evolution Title Loss of Vital AC Instrument Bus 057

KA Statement: Knowledge of the reasons for the following responses as they apply to Loss of Vital AC Instrument Bus:  
Actions contained in EOP for loss of vital ac electrical instrument bus

Explanation of Answers: 55.41.b(10,6,7) Each loss of vital bus prevents auto and manual rod WITHDRAWAL, based on the PRNI on each channel bistables being energized for High Rx Power, which is a rod block. A loss of A bus would cause rods to drive in in auto at maximum rate due to the loss of PT-505 Turbine Steamline inlet pressure, and rods would be placed in manual, and remain available. B and C buses would not cause auto rod movement, and manual rod control remains available. D bus is a unique loss that affects rod control speed and direction, and rods remain "as is" with no ability to move them via the Rod Control System. While memorization of all 115VAC vital loads is not required, knowledge of how rod control is affected by each of the 4 115VAC vital instrument buses is not minugia.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of 2A(B,C,D) 115 VAC Vital Instrument Bu	S2.OP-AB.115-0001(2,3,4)			20,19,14

L.O. Number

AB1151E003

Objectives

Material Required for Examination

Question Source: New Question Modification Method: Used During Training Program ☐

Question Source Comments

Comment

RO SkyScraper

SRO SkyScraper

RO System/Evolution List

SRO System/Evolution List

Outline Changes

Question Topic RO 18

Given the following conditions:

- Unit 2 is in MODE 3, NOP, NOT.
- The control room receives OHA B-18 2C 125VDC CNTRL BUS VOLT LO
- Upon further investigation, the NCO reports that 2C 125VDC bus voltage is at 126 volts, and no current is indicated on 2RP9.

Describe the condition which is present, and the actions required to be taken?

2C 125VDC bus is...

- a. within the normal operating band, direct maintenance to raise the charger float voltage.
- b. experiencing a minor short-to-ground, initiate S2.OP-SO.125-0004 125VDC GROUND DETECTION.
- c. below the Tech Spec minimum setpoint, secure the operating battery charger and place the standby battery charger in service.
- d. above the Tech Spec minimum setpoint, ONLY continued monitoring for any indication of further voltage degradation is required.

Answer a Exam Level R Cognitive Level Application Facility: Salem 1 &amp; 2 ExamDate: 12/15/2014

KA: 000058G446 2.4.46 RO Value: 4.2 SRO Value: 4.2 Section: EPE RO Group: 1 SRO Group: 1 55.43 ✓

System/Evolution Title Loss of DC Power 058

KA Statement:

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

Explanation of Answers: 55.41.b(8) A is the correct answer because the control band as specified in the NCOs logs is 125-139.8V. Voltage is in the normal band, and the AR states to have maint adjust the float voltage. Distractor b is incorrect because there is no indication of a ground. Distractor c is incorrect because action IS required IAW ARP. Distractor d is incorrect because voltage is above the TS limit.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Overhead Annunciator Window B	S2.OP-AR ZZ-0002		35	35
Control Room Logs Modes 1-4	S2.OP-DL.ZZ-0003	Att. 1	48	97

L.O. Number

Objectives

DCELECE008

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Direct From Source Used During Training Program ☐

Question Source Comments

Comment

Question Topic RO 19

Given the following conditions:

- Unit 2 is operating at 7% power.
- Unit 1 and Unit 2 Operators receive Console Alarm CONTROL AIR PRESSURE LO.
- Station Air header pressure is 110 psig and steady.
- Control Air header "A" pressure is 78 psig and dropping slowly.
- Control Air header "B" pressure is 93 psig and steady.

Which choice describes the actions required to be performed by the Unit 2 operators?

- a. Immediately trip the reactor and GO TO 2-EOP-TRIP-1 REACTOR TRIP OR SAFETY INJECTION.
- b. GO TO S2.OP-AB.CA-0001 LOSS OF CONTROL AIR, and trip the reactor due to loss of the "A" control air header pressure.
- c. Insert control rods to lower power to <5%, and start 21 and 22 AFW pumps IAW S2.OP-AR.ZZ-0011 CONTROL CONSOLE 2CC1.
- d. GO TO S2.OP-AB.CA-0001 LOSS OF CONTROL AIR, and verify redundant air panels have swapped to the "B" control air header.

Answer d Exam Level R Cognitive Level Application Facility: Salem 1 &amp; 2 ExamDate: 12/15/2014

KA: 000065G107 2.1.7 RO Value: 4.4 SRO Value: 4.7 Section: EPE RO Group: 1 SRO Group: 1 55.43 ✓

System/Evolution Title Loss of Instrument Air 065

KA Statement:

Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

Explanation of Answers: 55.41.b(7)A is incorrect because a reactor trip is not required since the given condition in the stem does not indicate a loss of Control Air on both headers. B is incorrect because a reactor trip is not required. D is correct because the ARP for the alarms directs the operators to go to AB.CA, and they will verify swap of panels after reading NOTE at step 55 or 63. Distracter C is incorrect because there is no direction to lower power and start AFW pps.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Control Air	S2.OP-AB.CA-0001			18

L.O. Number

Objectives

ABCA01E003

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Direct From Source Used During Training Program ☐

Question Source Comments Q75662

Comment

RO SkyScraper

SRO SkyScraper

RO System/Evolution List

SRO System/Evolution List

Outline Changes

Question Topic RO 20

Given the following conditions:

- Unit 2 is operating at 100% power.
- There is no primary-to-secondary leakage.
- Excess letdown is in service due to a problem with the 2CV18, Letdown Pressure Control Valve, which is currently shut.
- A fuel pin failure occurs, releasing a large amount of fission products into the RCS.

Of the following radiation monitors, which would show a change because of the failed fuel BEFORE the others?

- a. 2R26, Reactor Coolant Filter Monitor.
- b. 2R31, Letdown Heat Exchanger Monitor.
- c. 2R4, Charging Pump Room Area Monitor.
- d. Any 2R19, Steam Generator Blowdown Monitor.

Answer c Exam Level R Cognitive Level Application Facility Salem 1 &amp; 2 ExamDate: 12/15/2014

KA: 000076A104 AA1.04 RO Value: 3.2 SRO Value: 3.4 Section: EPE RO Group: 2 SRO Group: 2 55.43

System/Evolution Title High Reactor Coolant Activity 076

KA Statement: Ability to operate and / or monitor the following as they apply to High Reactor Coolant Activity:  
Failed fuel-monitoring equipment

Explanation of Answers: 55.41.b(11,5)With the CV18 shut, normal letdown will be out of service, and if out of service for an extended period of time, will have Excess letdown placed in service. Excess letdown does NOT pass through the 2R31 process monitor. The RC filter also will not have flow from the discharge of the mixed bed demins since normal letdown is secured. The stem states that there is no pri to sec leakage, so the R19s should be unaffected. The excess letdown line flowpath goes to the suction of the charging pumps where it would be seen on 2R4 as a rise in the area radiation levels around the pumps.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Radiation System Monitoring	S2.OP-SO.RM-0001			38
CVCS System	205228			73
High Activity in the Reactor Coolant System	S2.OP-AB.RC-0002			8

L.O. Number

Objectives

ABRC02E001

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Direct From Source Used During Training Program

Question Source Comments Q113075

Comment

## Question Topic

RO 21

Given the following conditions:

- Salem Unit 1 is offline.
- Salem Unit 2 operating at 95% power, 1150 Mwe, with its Power System Stabilizer (PSS) out of service.
- Unit 2 Main Generator gas pressure is 75 psig.
- Hope Creek is operating at 100% power, with its PSS out of service.
- The Hope Creek 5-6 breaker is out of service.
- A 500KV grid disturbance results in lower than normal grid voltage.

Which of the following identifies Main Generator loading which is outside the allowable for Salem Unit 2 IAW A-5-500-EEE-1686, Artificial Island Operating Guide?

Trip-A-Unit is NOT armed.

Salem Unit 2 operating at \_\_\_\_\_ Mwe with MVAR loading \_\_\_\_\_ out.

a. 1100, 225.

b. 1100, 525.

c. 1150, 225.

d. 1150, 525.

Answer: c Exam Level: R Cognitive Level: Application Facility: Salem 1 & 2 Exam Date: 12/15/2014

KA: 000077A202 AA2.02 RO Value: 3.5 SRO Value: 3.6 Section: EPE RO Group: 1 SRO Group: 1 55.43

System/Evolution Title: Generator Voltage and Electric Grid Disturbances 077

KA Statement: Ability to determine and interpret the following as they apply to Generator Voltage and Electric Grid Disturbances:  
Voltage outside the generator capability curve

Explanation of Answers: 55.41.b(4) With Unit 1 O/S and the HC 5-6 breaker O/S, the correct curve is 2S2H-5-6 on page 291. With both Units PSS O/S, the red dashed line will be used for allowable generator excitation. A is incorrect because the PSS is O/S. If either units PSS was IN service, then it would be correct. The 2 distracters with higher MVARS are both within the limit. Since there are two different Mwe loading conditions, and the choices for each are high/low, the answer cannot be obtained by ruling out 2 of the choices because there would have to be 2 correct answers for them to be correct. Not a direct lookup because several different figures are given.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Artificial Island Operating Guide	A-5-500-EEE-1686		291	11

## L.O. Number

GEN002E016

GEN002E017

## Objectives

<b>Material Required for Examination:</b>		NO 21 A-8-500-EEE-1883, pages 123,291,308	
<b>Question Source:</b>	New	<b>Duration/Modification Method:</b>	
<b>Used During Training:</b>	Yes <input type="checkbox"/> No <input type="checkbox"/>		
<b>Comment:</b>			

## Question Topic

RO 22

Given the following conditions:

- A Small Break LOCA has occurred.
- The crew is performing the actions of EOP-LOCA-2, POST LOCA COOLDOWN AND DEPRESSURIZATION.
- All SI pumps are running.
- All RCPs are running.
- RCS cooldown via Main Steam Dumps is ongoing.
- RCS Tave is 510°F and lowering at a rate of 90°F/Hr.
- PZR level indicates 26% and rising.
- The RCS depressurization has been secured and RCS pressure is 1310 psig and stable.

Which of the following describes the next major action to be implemented in the EOP to mitigate the current conditions?

- a. Stop ALL RCPs due to pressure < 1350 psig and ECCS flow established.
- b. Stop the cooldown. Energize all PZR heaters to collapse voids and stabilize PZR level.
- c. Stop all but one RCP and begin the SI flow reduction process by stopping ECCS pumps.
- d. Recommence the RCS depressurization using normal spray to collapse voids and refill the PZR.

Answer: c Exam Level: R Cognitive Level: Comprehension Facility: Salem 1 &amp; 2 Exam Date: 12/15/2014

KA: 00WE03K102 EK1.2 RO Value: 3.6 SRO Value: 4.1 Section: EPE RO Group: 2 SRO Group: 2 55.43

System/Evolution Title: LOCA Cooldown and Depressurization

E03

KA Statement: Knowledge of the operational implications of the following concepts as they apply to LOCA Cooldown and Depressurization:  
Normal, abnormal and emergency operating procedures associated with (LOCA Cooldown and Depressurization).

Explanation of Answers: 55.41.B(10) The idea for depressurization is to refill the pressurizer. Since the pressurizer is already filled (>25%), go directly to flow reduction. There will be no voids if RCPs are running, and there is no CAS transition to TRIP-3.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loca Cooldown and Depressurization	2-EOP-LOCA-2			25

## L.O. Number

LOCA02E001

## Objectives

## Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Editorially Modified Used During Training Program

Question Source Comments: Q74666

## Comment

RO SkyScraper

SRO SkyScraper

RO System/Evolution List

SRO System/Evolution List

Outline Changes

Question Topic: RO 23

Given the following conditions:

- Unit 2 is operating at 100% power.
- 2PR2 is leaking, and 2PR7 is shut to comply with TSAS 3.4.5. action a.
- Both SGFPs trip.
- When the Main Generator breakers opened, 2B 4KV vital bus deenergized and remains deenergized.
- Only 23 AFW pump started, and it tripped 2 minutes after the Rx was tripped.
- No AFW pumps are in service or can be started.
- Operators have transitioned out of EOP-TRIP-1.

Which of the following identifies how Bleed and Feed of the RCS will be accomplished IAW 2-EOP-FRHS-1, Response to Loss of Secondary Heat Sink?

- a. SI pump injection and bleed flow from 2PR1 only.
- b. Charging pump injection and bleed flow from both PORVs.
- c. SI pump injection and bleed flow from the reactor head vent valves.
- d. Charging pump injection and bleed flow from 2PR1 and the reactor head vent valves.

Answer: d Exam Level: R Cognitive Level: Application Facility: Salem 1 &amp; 2 Exam Date: 12/15/2014

KA: 00WE05K102 EK1.2 RO Value: 3.9 SRO Value: 4.5 Section: EPE RO Group: 1 SRO Group: 1 55.43

System/Evolution Title: Loss of Secondary Heat Sink E05

KA Statement: Knowledge of the operational implications of the following concepts as they apply to Loss of Secondary Heat Sink:  
Normal, abnormal and emergency operating procedures associated with (Loss of Secondary Heat Sink).

Explanation of Answers: 55.41.b(10) The 2PR7 would be opened if it had power in this case to allow 2PR2 to be used as part of the Bleed path. With 2PR7 shut and B bus deenergized, both PORV block valves cannot be opened per step 26.1 of FRHS-1. Rx head vents are the next step. A single Charging pump will be supplying the feed portion, as step 25.1 asks if EITHER charging pump is running, and 22 will be after SI initiation at step 24.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Secondary Heat Sink	2-EOP-FRHS-1			24

L.O. Number

Objectives

FRHS00E006

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Direct From Source Used During Training Program

Question Source Comments: Q122559

Comment





Question Topic

RO 26

Given the following conditions:

- Unit 2 has tripped from 100% power due to a Loss of Off-Site Power.
- Operators are performing a cooldown IAW 2-EOP-TRIP-6 NATURAL CIRCULATION RAPID COOLDOWN WITH RVLIS.

Which choice identifies the MINIMUM RVLIS Full Range level required to be maintained during the cooldown, and its significance?

- a. 74% to ensure positive level indication of RCS.
- b. 100% to ensure positive level indication of RCS.
- c. 74% to prevent steam from entering the RCS hot legs.
- d. 100% to prevent steam from entering the RCS hot legs.

Answer: ☐ c Exam Level: ☐ R Cognitive Level: Memory Facility: Salem 1 & 2 Exam Date: 12/15/2015KA: 00WE10A103 EA1.3 RO Value: 3.4 SRO Value: 3.7 Section: EPE RO Group: 1 SRO Group: 1 55.43 ☐

System/Evolution Title: Natural Circulation with Steam Void in Vessel with/without RVLIS E10

KA Statement: Ability to operate and / or monitor the following as they apply to Natural Circulation with Steam Void in Vessel with/without RVLIS:  
Desired operating results during abnormal and emergency situations.

Explanation of Answers: 55.41.b(10)74% is minimum allowed at step 10, and get into a do loop until it is satisfied. The Bases Document states that if steam enters the hot legs, there may be some potential for it to reach the top of the SG U tubes, thereby disrupting the natural circulation flow circuit. By monitoring RVLIS and limiting the void growth to the top of the hot legs, the potential for introducing voids into the SG U tubes is minimized.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Natural Circulation Rapid Cooldown with RVLIS	2-EOP-TRIP-6	Bases Document	22	23

L.O. Number

Objectives

TRP004E004

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Direct From Source Used During Training Program ☐

Question Source Comments

Comment

Question Topic RO 27

Given the following conditions on Unit 2:

- A LBLOCA has occurred.
- Operators are performing 2-EOP-LOCA-5, Loss of Emergency Recirculation.
- Containment pressure is 15.1 psig and is rising slowly.

Which of the following describes how the Containment Spray system will be operated, and why?

The Containment Spray System is operated as directed in...

- a. 2-EOP-FRCE-1, Response to Excessive Containment Pressure, since restoration of the critical safety function takes precedence.
- b. LOCA-5 because it establishes minimum required containment spray flow and conserves RWST inventory.
- c. 2-EOP-FRCE-1 because actions concerning Containment Spray operation are more restrictive.
- d. LOCA-5 since FRPs are NOT implemented during the performance of LOCA-5.

Answer b Exam Level R Cognitive Level Application Facility: Salem 1 &amp; 2 Exam Date: 12/15/2015

KA: 00WE11A201 EA2.1 RO Value: 3.4 SRO Value: 4.2 Section: EPE RO Group: 1 SRO Group: 1 55.43 ✓

System/Evolution Title Loss of Emergency Coolant Recirculation E11

KA Statement: Ability to determine and interpret the following as they apply to Loss of Emergency Coolant Recirculation:

Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

**Explanation of Answers:** 55.41.b(10) Upon entering FRCE-1, step 3.1 asks if LOCA-5 is in effect. The yes path states that CS pumps are to be operated IAW LOCA-5. The basis document states that this is because in FRCE, maximum available heat removal system operability is warranted to reduce containment pressure, whereas in LOCA-5 a less restrictive criteria permits reduced spray pump operation depending on RWST level, containment pressure, and # of CFCU's operating. The less restrictive criteria in LOCA-5 is used because recirculation flow to the RCS is not available, and it is very important to conserve RWST water, if possible, by stopping containment spray pumps. So while the operator WILL enter FRCE-1 due to PURPLE path of containment pressure > 15 psig, the containment spray pumps will be operated IAW LOCA-5.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Emergency Coolant Recirculation	2-EOP-LOCA-5			

L.O. Number

Objectives

LOCA05E005

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Direct From Source Used During Training Program ☐

Question Source Comments Q80995

Comment

## Question Topic RO 28

Given the following conditions:

- Unit 1 is operating at 85% power steady state, MOL.
- Rod control is in AUTO.
- Control Bank D is at 185 steps.
- Control rods begin withdrawing with no demand signal present.
- Operators place rod control in MANUAL and rod motion stops.
- A Rx trip is not generated, nor is one required by plant conditions.
- Operators determine that Control Bank D rods have withdrawn a total of 10 steps.

Which of the following identifies the effect of the rod motion?

- a. Overpower Delta Temperature trip (OPDT) setpoint has risen.
- b. Axial Flux Difference (AFD) has become less negative.
- c. Quadrant Power Tilt Ratio (QPTR) has risen.
- d. Shutdown margin has lowered.

Answer b Exam Level R Cognitive Level Application Facility: Salem 1 &amp; 2 ExamDate: 12/15/2014

KA: 001000K506 K5.06 RO Value: 3.8 SRO Value: 4.1 Section: SYS RO Group: 2 SRO Group: 2 55.43

System/Evolution Title Control Rod Drive System 001

KA Statement: Knowledge of the operational implications of the following concepts as they apply to the Control Rod Drive System:  
Effects of control rod motion on axial offset

Explanation of Answers: 55.41.b(1) Salem normally operates with a negative AFD except for very late in core life. As rods move out, more power will be produced in the upper half of the core, and indicated AFD will become less negative. A is incorrect because the OP/DT setpoint is not dependent on rod position. QPTR should be unaffected because the change in power will be seen on all planes equally. D is incorrect because SDM is not affected by rod position, since the rods are still trippable.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
General Physics Lesson Plan Rx Theory		Chapter		4

L.O. Number

Objectives

RXOPERE019

## Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Editorially Modified Used During Training Program

Question Source Comments Q83980

Comment

Question Topic RO 29

Given the following conditions:

- Unit 1 is operating at 100% power.
- Reactor Coolant flow measurements determine that 11 RC loop has experienced a 5% reduction in flow from its expected 100% flow.

Which of the following identifies how this 5% flow reduction in 11 loop has affected the primary plant in relation to the previous 100% flow conditions?

Assume the 3 other loop flows remain the same.

a. Delta T in the 11 RCS loop will be lower.

b. Steam pressure in 11 SG will be higher.

c. The reactor core will be operating closer to DNB.

d. Demand on the Pressurizer variable heaters at 2235 psig will be lower.

Answer c Exam Level R Cognitive Level Comprehension Facility: Salem 1 &amp; 2 ExamDate: 12/15/2014

KA: 002000A303 A3.03 RO Value: 4.4 SRO Value: 4.6 Section: SYS RO Group: 2 SRO Group: 2 55.43

System/Evolution Title Reactor Coolant System 002

KA Statement: Ability to monitor automatic operations of the Reactor Coolant System including:  
Pressure, temperatures, and flowsExplanation of Answers: 55.41.b(2,3) A lower single loop flow will cause total flow through the core to lower. Using  $Q=mc(D/T)$  if mass flow rate lowers, then the D/T has to go up if power remains the same, which it will due to MT gov valve reaction. This will cause the core to be operating closer to DNB.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision

L.O. Number

Objectives

RCS000E006

RCS000E013

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Direct From Source Used During Training Program

Question Source Comments Q111914

Comment

Question Topic RO 30

Given the following conditions:

- Unit 2 is operating at 75% power.
- 21 CCW pump is C/T for maintenance.
- 21 charging pump is in service.

Which of the following would ALWAYS require entry into S2.OP-AB.RCP-0001, Reactor Coolant Pump Abnormality?

- a. CCW Surge Tank level begins rising.
- b. 2A 4KV vital bus locks out on Bus Differential.
- c. 2C 4KV vital bus locks out on Bus Differential.
- d. Any RCP Shaft vibration indicates 4 mils on RP3.

Answer c Exam Level R Cognitive Level Application Facility: Salem 1 &amp; 2 ExamDate: 12/15/2014

KA: 003000K202 K2.02 IRO Value: 2.5\* SRO Value: 2.6\* Section: SYS RO Group: 1 SRO Group: 1 55.43

System/Evolution Title Reactor Coolant Pump System 003

KA Statement: Knowledge of bus power supplies to the following:  
CCW pumps

Explanation of Answers: 55.41.b(7,8) A is incorrect because there are reasons other than Thermal Barrier rupture that can cause CCW surge tank rise. D is incorrect because normal shaft vibration is ~ 4 mils, but plausible because flange vibration >3 mils is entry condition. 2A supplies 23 charging pump, not 21. 2C bus supplies 23 CCW pump, and with 21 CCW pump C/T would cause OHA D20-23 to annunciate on low bearing water flow, which requires entry into AB.RCP.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Reactor Coolant Pump Abnormality	S2.OP-AB.RCP-0001		2	21

L.O. Number

Objectives

RCPUMPE005

ABRCP1E004

Material Required for Examination

Question Source: New Question Modification Method: Used During Training Program

Question Source Comments

Comment

## Question Topic RO 31

Given the following conditions:

- Unit 2 is operating at 100% power.
- 2CC190, RCP THERM BAR CC OUTLET V, fails shut.

Which one of the following describes the effect on RCP temperatures, if any, as a result of this failure?

ALL RCP...

a. lower motor bearing temperatures will rise.

b. bearing temperatures will remain the same.

c. #1 seal leakoff temperatures will rise.

d. motor winding temperatures will rise.

Answer b Exam Level R Cognitive Level Application Facility Salem 1 &amp; 2 ExamDate 12/15/2014

KA: 003000K604 K6.04 RO Value: 2.8 SRO Value: 3.1 Section: SYS RO Group: 1 SRO Group: 1 55.43

System/Evolution Title Reactor Coolant Pump System 003

KA Statement: Knowledge of the effect of a loss or malfunction on the following will have on the Reactor Coolant Pump System:  
Containment isolation valves affecting RCP operation

Explanation of Answers: 55.41(3) The CCW line supplying the RCPs is a single line supplying both bearing cooling and Thermal Barrier cooling. Once the line inside containment splits, the CCW from the Thermal Barriers has its own, separate return line, which is isolated by the 2CC190 (inside containment) and 2CC131 (outside containment.) The Thermal Barrier CCW flow acts to cool reactor coolant flowing upwards through the thermal barrier upon a loss of seal injection flow. With normal seal injection, the loss of CCW to the thermal barrier would not affect any RCP components.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Unit 2 Component Cooling	205331-3			35

## L.O. Number

## Objectives

RCPUMPE004

RCPUMPE015

RCPUMPE016

## Material Required for Examination

Question Source: Previous 2 NRC Exams Question Modification Method: Direct From Source Used During Training Program

Question Source Comments 9/2011 NRC RO Exam Q30

## Comment

Question

RO-41

Unit 1 is operating at 100% power when the 1CC71, Letdown HX CC Control Valve fails to 50% open and remains 50% open.

Which of the following describes the impact of this failure?

- a. RCS temperature will rise. Perform a boration of the RCS if required to restore Tavg to program.
- b. RCS temperature will rise. Remove CVCS Demineralizers from service, then place Excess Letdown in service to restore demineralization capability.
- c. The CVCS Letdown Demineralizers will be bypassed when letdown temp reaches 136°F. Lithium addition required to control RCS pH will be higher than normal.
- d. The CVCS Letdown Demineralizers will be bypassed when letdown temp reaches 136°F. Lithium addition required to control RCS pH will be lower than normal.

Answer: a Exam Level: R Cognitive Level: Application Facility: Salem 1 & 2 Exam Date: 12/15/2014

KA: 004000A230 A2.30 RO Value: 3.3 SRO Value: 3.6 Section: SYS RO Group: 1 SRO Group: 1 55.43 ✓

System/Evolution Title: Chemical and Volume Control System 004

KA Statement: Ability to (a) predict the impacts of the following on the Chemical and Volume Control System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation:

Reduction of boron concentration in the letdown flow; its effects on reactor operation

Explanation of Answers: 55.41.b(5) Boron affinity of resin bed is affected by temperature of coolant passed through bed. a. At lower temperatures, borate ion bonding to exchange site contains three boron atoms. b. At higher temperatures, borate ion contains only one boron atom c. Result of this characteristic is that at lower temperatures resins are more efficient at removing boron from coolant than at higher temperatures. B is incorrect but plausible if it is thought that the Excess Letdown line contains demins that would restore boron concentration when placed in service. C and D are incorrect because temperature will be lowering in letdown line, not rising. Lithium control would be affected during normal daily chemical additions.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
General Physics LP- Demineralizers and Ion Ex			31	

L.O. Number

Objectives

CVCS00E015

Material Required for Examination

Question Source: New Question Modification Method: Used During Training Program ☐

Question Source Comments

Comment



Question Topic RO 34

Given the following conditions:

- Unit 1 is operating at 100% power.
- 11 CFCU is C/T.
- 1C EDG is paralleled to 1C 4KV Vital Bus for monthly run.
- A 1" line connected to RCS loop 11 shears off.
- Operators initiate a Rx trip and SI.
- 1A 4KV Vital bus locks out on Bus Differential.

Which of the following describes the difference in containment pressure response between this LOCA, and one with the same conditions except 1C EDG was initially aligned for normal standby operation, and why?

- a. the same since all required pumps will be running.
- b. higher since only ONE Containment Spray pump will be operating.
- c. higher since NEITHER Containment Spray pump will be operating.
- d. lower because ECCS will inject faster due to the EDG already being running.

Answer a Exam Level R Cognitive Level Comprehension Facility: Salem 1 & 2 ExamDate: 12/15/2014

KA: 006000A401 A4.01 RO Value: 4.1 SRO Value: 3.9 Section: SYS RO Group: 1 SRO Group: 1 55.43

System/Evolution Title Emergency Core Cooling System 006

KA Statement: Ability to manually operate and/or monitor in the control room:  
Pumps

Explanation of Answers: 55.41.b(3,7) A is correct since a 1" break will be within the capability of the two high pressure injection pumps (11 and 12 CVCS pps) to prevent a major lowering of PZR pressure. The loss of 1A vital bus would affect 11 RHR, 11 CS, and 13 Charging pp, (and 11 CFCU which is C/T) none of which would be injecting for ECCS or for containment pressure control, since the small size of the leak would not cause RCS pressure to drop to their shutoff heads, or containment pressure to rise for CS requirement.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem UFSAR		Section 15.3		25

L.O. Number

Objectives

ECCS00E016

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Editorially Modified Used During Training Program

Question Source Comments Q111916

Comment

Question Topic

RO 35

Given the following conditions:

- Unit 2 experienced a LOCA while operating at 100% power.
- A Rx trip and SI initiation were successful.

During the response to the LOCA in the EOP network, which of the following overhead alarms would be unexpected if it were to occur?

Assume containment pressure peaks at 10 psig during the event.

a. D-41, BIT DISCH PRESS HI.

b. C-12, 22 CFCU AIRFLO TRBL.

c. C-10, CNTMT SUMP OVERFLO

d. D-48, SUBCLG CH B MARGIN LO

Answer a Exam Level R Cognitive Level Comprehension Facility: Salem 1 &amp; 2 Exam Date: 12/15/2014

KA: 006000G446 2.4.46 RO Value: 4.2 SRO Value: 4.2 Section: SYS RO Group: 1 SRO Group: 1 55.43 ✓

System/Evolution Title Emergency Core Cooling System 006

KA Statement:

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

Explanation of Answers:

55.41.b.7) OHA C-12 is expected whenever the CFCU is in slow speed, which it would be for SI initiation. OHA D-41 would NOT be expected, setpoint is 2610 psig, and charging pump discharge pressure would be much less than that, above the RCS pressure which would be lower due to the LOCA. C-10 would be expected as the containment sump would fill after the Phase A isolated containment and the leak filled up the sump. With a peak cont press of 10 psig, the LOCA, will definitely lose subcooling, and alarm is at 10°F margin to saturation.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Overhead Annunciator Window C	S2.OP-AR.ZZ-0003			17
Overhead Annunciator Window D	S2.OP-AR.ZZ-0004			26

L.O. Number

Objectives

ECCS00E008

Material Required for Examination

Question Source: New Question Modification Method: Used During Training Program ☐

Question Source Comments

Comment

RO SkyScraper

SRO SkyScraper

RO System/Evolution List

SRO System/Evolution List

Outline Changes

Question Topic

RO 36

With Unit 1 operating at 100% power, 1PR1 opens in automatic with no demand to open, and cannot be shut.

Which of the following describes the effect of this failure, and how the actions the crew should perform IAW S1.OP-AB.PZR-0001, Pressurizer Pressure Malfunction will affect this event?

- a. The PRT rupture disk will rupture when pressure reaches 10 psig if the 1PR6 Block Valve is not shut.
- b. The PRT rupture disk will rupture when pressure reaches 100 psig if the 1PR6 Block Valve is not shut.
- c. If PZR heaters cannot restore pressure, the Rx will be manually tripped before an auto trip is generated on OT/DT at 2100 psig.
- d. If PZR heaters cannot restore pressure, the Rx will be manually tripped before an auto trip is generated on low PZR pressure at 1985 psig.

Answer: b Exam Level: R Cognitive Level: Application Facility: Salem 1 & 2 Exam Date: 12/15/2014

KA: 007000A201 A2.01 RO Value: 3.9 SRO Value: 4.2 Section: SYS RO Group: 1 SRO Group: 1 55.43 ✓

System/Evolution Title: Pressurizer Relief Tank/Quench Tank System 007

KA Statement: Ability to (a) predict the impacts of the following on the Pressurizer Relief Tank/Quench Tank System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation:  
Stuck-open PORV or code safety

Explanation of Answers: 55.41.b(5,7,10) AB.PZR directs closing the PORV block valve if the PORV cannot be shut. If it is not shut the PRT rupture disk will rupture at 100 psig. 10 psig is the high pressure alarm setpoint. There are steps in AB.PZR for operating PZR heaters, but for a PORV failure the heaters will be unable to maintain PZR pressure. The 2 trip setpoints are incorrect. The OT/DT trip setpoint is not a psig value, but its equivalent value is ~ 2,000 psig. (Actual Salem data on actual Rx trip) The low PZR pressure Rx trip is at 1865 psig.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Pressurizer Pressure Malfunction	S1.OP-AB.PZR-0001			16
Control Console CC2	S1.OP-AR.ZZ-00012		53	36
#1 Unit Reactor Coolant	205201 Sht 1			64

L.O. Number

Objectives

PZRPRTE009

Material Required for Examination

Question Source: New Question Modification Method: Used During Training Program ☐

Question Source Comments

Comment

Question Topic: RO 37

Given the following conditions:

- Unit 2 is in MODE 3 @ NOT, NOP.
- 21 and 22 CCW pumps are in service.
- 23 CCW pump is in MANUAL.
- 2C 4KV Vital Bus senses an undervoltage condition, and loads in SEC MODE II\*.

Which of the following identifies the Tech Spec consequence of this event on the CCW system?

TSAS 3.7.3, Component Cooling System is...

- a. entered due to not having 2 loops of CCW operable.
- b. NOT entered because ALL CCW pumps remain operable.
- c. NOT entered because 2 of the 3 CCW pumps remain operable.
- d. entered due to high system flow from 3 CCW pumps in service through 2 heat CCW HX's.

Answer: b Exam Level: R Cognitive Level: Application Facility: Salem 1 &amp; 2 Exam Date: 12/15/2014

KA: 008000G237 2.2.37 RO Value: 3.6 SRO Value: 4.6 Section: SYS RO Group: 1 SRO Group: 1 55.43 ✓

System/Evolution Title: Component Cooling Water System 008

KA Statement:

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

**Explanation of Answers:** 55.41.b.(7) CCW TSAS 3.7.3 requires 2 independent loops of CCW. The bases for that states that in order to have 2 operable loops, ALL 3 CCW pumps must be operable along with HX's and valves, etc. When the 2C SEC senses the undervoltage condition, it will open the 2C bus infeed breakers, start the EDG, strip loads, close the EDG output breaker, the sequence on BLACKOUT loads. 23 CCW pump is a blackout load, but not an ACCIDENT load. Additionally, the SEC locks out AUTO/MAN function of the CCW pump start circuitry, so the initial status of 23 CCW pump being in MANUAL has no effect on pump start/

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem Tech Specs		3.7.3 and bases		

L.O. Number

CCW000E010

Objectives

Material Required for Examination

Question Source: New Question Modification Method: Used During Training Program ☐

Question Source Comments

Comment

Question Topic: RO 38

With both PZR Spray Valves 2PS1 and 2PS3 in AUTO, which of the following describes the effect, if any, of 2PS3 PZR Spray Valve demand failing to 50% demand?

- a. No effect as the 2PS3 would close and transfer normal spray capability to 2PS1.
- b. All PZR Backup heaters in auto will energize when PZR pressure lowers to 2210 psig.
- c. All PZR Backup heaters in auto will energize when PZR pressure lowers to 2218 psig.
- d. PZR pressure will initially lower, and the Control Group heaters will fire full time to restore pressure w/o auto B/U heaters required.

Answer: b Exam Level: R Cognitive Level: Memory Facility: Salem 1 & 2 Exam Date: 12/15/2014

KA: 010000K301 K3.01 RO Value: 3.8 SRO Value: 3.9 Section: SYS RO Group: 1 SRO Group: 1 55.43

System/Evolution Title: Pressurizer Pressure Control System 010

KA Statement: Knowledge of the effect that a loss or malfunction of the Pressurizer Pressure Control System will have on the following:  
RCS

Explanation of Answers: 55.41.b(5) Normal PZR spray demand is ~13% on each PZR spray valve, as Salem runs with one set of B/U heaters in MANUAL ON. The failure to 50% effectively doubles the actual spray flow. The 2PS1 WILL shut, but more spray than needed is now present especially since 2PS3 is the dominant spray flow. PZR B/U heaters in auto will energize at 2210 psig, they turn off at 2218 psig. The control group heaters are for fine pressure control and do not have the capability to maintain pressure with 50% spray demand.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Pressurizer Pressure Malfunction	S2.OP-AB.PZR-0001			18
PZR Pressure and Level Control LP	NOS05PZRP&L			9

L.O. Number

Objectives

PZRP&amp;LE008

Material Required for Examination

Question Source: New Question Modification Method: Used During Training Program

Question Source Comments

Comment

RO SkyScraper

SRO SkyScraper

RO System/Evolution List

SRO System/Evolution List

Outline Changes

Question Topic RO 39

Given the following conditions:

- PZR safety valve PR3 is stuck slightly open.
- Charging pumps are maintaining RCS pressure at 1910 psig.
- PZR vapor space temperature is 630°F.
- The PRT level and pressure are 75% and 5 psig respectively.
- A NCO notes that the tail pipe temperature for PR3 indicates 310°F. He states that he believes that there is a problem with the indication since it is not reading as he expects for the current conditions.

What should the indication read?

a. 228°F.

b. 281°F.

c. 310°F.

d. 630°F.

Answer a Exam Level R Cognitive Level Application Facility: Salem 1 &amp; 2 Exam Date: 12/15/2014

KA: 010000K502 K5.02 RO Value: 2.6 SRO Value: 3.0 Section: SYS RO Group: 1 SRO Group: 1 55.43

System/Evolution Title Pressurizer Pressure Control System 010

KA Statement: Knowledge of the operational implications of the following concepts as they apply to the Pressurizer Pressure Control System:  
Constant enthalpy expansion through a valve

Explanation of Answers: 55.41.b.(5) With the PZR at 1910 and 630, the liquid is saturated (page 13 of steam tables). Since throttling is a constant enthalpy process, the downstream must be saturated for the pressure in the PRT. With 5 psig (20 psia), steam tables show a sat temp of 227.918 °F for 20 psia. (page 11). The 281 distracter is from a different bank question with 35 psig in PRT, but that would give away answer to Stuck Open PORV/PRT question. 310 is value given in stem, and 630 is what PZR is.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Steam Tables				

L.O. Number

Objectives

PZRPRTE008

Material Required for Examination RO 39 Steam Tables

Question Source: Facility Exam Bank Question Modification Method: Significantly Modified Used During Training Program

Question Source Comments Q145885

Comment

Question Topic: RO 40

Given the following conditions:

- Unit 2 is operating at 100% power.
- Console alarms SEAL WATER FLOW LO annunciate for ALL 4 RCPs.

Which of the following failures has led to these alarms?

- a. 2CV71, CHG HDR PCV has failed shut.
- b. PZR level program setpoint has failed high.
- c. 2CV115, Seal Return Relief valve has lifted and failed to reseal.
- d. Charging System Master Flow Controller demand has failed to 20%.

Answer: ☐ d ☐ Exam Level: ☐ R ☐ Cognitive Level: ☐ Application ☐ Facility: ☐ Salem 1 & 2 ☐ Exam Date: ☐ 12/15/2014

KA: ☐ 011000K606 ☐ K6.06 ☐ RO Value: ☐ 2.5\* ☐ SRO Value: ☐ 2.8 ☐ Section: ☐ SYS ☐ RO Group: ☐ 2 ☐ SRO Group: ☐ 2 ☐ 55.43 ☐

System/Evolution Title: ☐ Pressurizer Level Control System ☐ 011 ☐

KA Statement: ☐ Knowledge of the effect of a loss or malfunction on the following will have on the Pressurizer Level Control System:  
☐ Correlation of demand signal indication on charging pump flow valve controller to the valve position

Explanation of Answers: ☐ 55.41.b(5,6,7,8) The 2CV71 PCV is located on the charging line upstream of the tap to go to seal injection. Its closure would cause full pressure/flow to go to the RCP seals. PZR level program signal failing high would cause charging flow to remain the same (program is clipped at ~100% programmed level) or go up slightly, and also seal injection flow. The CV115 lifting on the return line should have no effect, or if any, it would cause seal inj flow to rise if it lowered seal return header pressure enough. The charging system master flow controller demand is normally ~40%, so 20% demand would give ~1/2 normal charging flow. Normal charging flow is ~90 gpm. This matches the intent of the KA, as there is no indication of CV55 flow control valve position (which controls charging flow when a centrifugal charging pump is in service) other than open/shut/ or indeterminate. The Master Flow controller controls the PDP charging pump speed, and hence its flow, when its in service, and controls the charging FCV CV-55 when centrifugal pump in service.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
S2.OP-SO.CVC-0002	Charging pump operation			40

L.O. Number

PZRP&amp;LE008

Objectives

<b>Material Required for Examination</b>			
<b>Question</b>		<b>Method:</b>	<b>Used During Training Program</b>
<b>Question Source Comments</b>			
<b>Comment</b>			





Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Concept Used Used During Training Program ☐

Question Source Comments Q48986 changed from what is trip that provides adequate DNBR to what trip will occur, and why

Comment

Question Topic: RO 43

Which of the following choices identifies a consequence if the ESF Actuation System fails to initiate ECCS components during a LOCA as described in 10 CFR 50.46, Acceptance Criteria for Emergency Core Cooling Systems for light-water nuclear power reactors?

- a. Initial core cooling capability may not be maintained.
- b. The maximum fuel element cladding temperature may exceed 2235° F.
- c. Cladding oxidation may exceed 17% of the total clad thickness at any location in the core.
- d. The hydrogen generated from the Zirc-water reaction may exceed 10% of the hydrogen generated if all of the zirconium surrounding the fuel reacted.

Answer: ☐ c Exam Level: ☐ R Cognitive Level: ☐ Memory Facility: ☐ Salem 1 & 2 Exam Date: ☐ 12/15/2014

KA: ☐ 013000K301 ☐ K3.01 RO Value: ☐ 4.4? SRO Value: ☐ 4.7 Section: ☐ SYS RO Group: ☐ 1 SRO Group: ☐ 1 55.43 ☐

System/Evolution Title: ☐ Engineered Safety Features Actuation System ☐ 013

KA Statement: ☐ Knowledge of the effect that a loss or malfunction of the Engineered Safety Features Actuation System will have on the following:  
☐ Fuel

Explanation of Answers: ☐ 55.41.b(7)ECCS is a system which ESFAS actuates. 10CFR50.46 paragraph b delineates the Acceptance Criteria for a LOCA. Also Salem FSAR contains the same criteria copied from 10CFR46 in section 15.4.1.1. Choice A is incorrect because the fuel cladding temperature criteria is 2200°F. 2235 psig is normal RCS operating pressure.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Acceptance criteria for Emergency Core Coolin	10 CFR 50.46			
Salem FSAR		15.4.1.1		

L.O. Number

Objectives

ESF000E015

Material Required for Examination

Question Source: ☐ Facility Exam Bank Question Modification Method: ☐ Concept Used ☐ Used During Training Program ☐

Question Source Comments: ☐ Q80570

Comment

Question Topic

RO 44

Under which of the following conditions would ALL outward rod motion be blocked?

- a. Rods are at ARO position.
- b. PRNI Channel 2N43 fails high.
- c. RCS loop 21 OT/DT is 64.7°F with an OT/DT trip setpoint of 69°F.
- d. PT-505 Turbine Steamline Inlet Pressure Transmitter fails to 0 psig.

Answer: ☐ b Exam Level: ☐ R Cognitive Level: Application Facility: Salem 1 & 2 Exam Date: 12/15/2014KA: 015000K402 K4.02 RO Value: 3.7 SRO Value: 3.9 Section: SYS RO Group: 2 SRO Group: 2 55.43 ☐

System/Evolution Title: Nuclear Instrumentation System 015

KA Statement: Knowledge of Nuclear Instrumentation System design feature(s) and or interlock(s) which provide for the following:  
Rod motion inhibits

Explanation of Answers: 55.41.b(6,7) A is incorrect because at All Rods Out position (Control Grade Interlock C-11), all AUTO outward rod motion is blocked. This position is set for each fuel cycle, meaning ARO is a number, not a physical stop in the core. B is correct because 1/4 PR NI &gt;103% is C-2 and blocks ALL outward rod movement. C is incorrect because the control grade interlock C-3 is actuated within 3% of the OT/DT Rx trip setpoint. 64.7/69=93.8%. D is incorrect because with steamline inlet pressure &lt; 15%, (Permissive P-2) outward auto rod movement is blocked, manual still works.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Licensed Operator Fluency List	NOS05FLUNCY-09		11	9

L.O. Number

FLUNCYE002

Objectives

Material Required for Examination

Question Source: New Question Modification Method: Used During Training Program ☐

Question Source Comments

Comment

RO SkyScraper

SRO SkyScraper

RO System/Evolution List

SRO System/Evolution List

Outline Changes

Question Topic

RO 45

Which of the following indications is the ONLY one allowed to be used as part of the steps performed to verify natural circulation is occurring if the Core Exit Thermocouple Processing System becomes de-energized IAW 2-EOP-CFST-1 Critical Safety Function Status Trees?

- a. Plant Computer readings.
- b. Subcooling Margin Monitor readings.
- c. Installed Control Room Class 1E readings.
- d. Safety Parameter Display System readings.

Answer: ☐ c Exam Level: ☐ R Cognitive Level: Memory Facility: Salem 1 & 2 Exam Date: 12/15/2014

KA: 017000K301 K3.01 RO Value: 3.5\* SRO Value: 3.7 Section: SYS RO Group: 2 SRO Group: 2 5543 ☐

System/Evolution Title: In-Core Temperature Monitor System

017

KA Statement: Knowledge of the effect that a loss or malfunction of the In-Core Temperature Monitor System will have on the following:  
Natural circulation indications

Explanation of Answers: 55.41.b(7) CET's are the primary indication of RCS temperature. The CET Processing system takes the input from all CET's, converts it to a digital signal, and sends them to various places, including the Subcooling Margin Monitor, SPDS, and the eP-250 Computer. With the system (2 trains) deenergized, there is no CET indication to send anywhere. The only remaining indications for RCS temperature are provided via the Class 1E control console indications. The CET temperature indications normally provided on SPDS and Plant Computer are the one exception to those systems being used as primary indications, and are exempt from 1E requirements.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Critical Safety Function Status Trees	2-EOP-CFST-1		2	25
In Core Nuclear Instrumentation Lesson Plan	NOS05INCORE-04		28	4

L.O. Number

Objectives

INCOREE007

INCOREE011

Material Required for Examination

Question Source: New Question Modification Method: Used During Training Program ☐

Question Source Comments

Comment





Question Topic RO 48

Which of the following contains ONLY the action(s) and/or conditions REQUIRED to electrically reset an AUTOMATIC Containment Spray initiation?

a. Depress BOTH Reset Phase B PBs, then depress BOTH Reset Spray Actuation PBs at ANY containment pressure.

b. Containment pressure <15 psig. Depress BOTH Reset SI PBs, depress BOTH Reset Spray Actuation PBs.

c. Containment pressure <15 psig. Depress BOTH Reset Spray Actuation PBs.

d. Depress BOTH Reset Spray Actuation PBs at ANY containment pressure.

Answer d Exam Level R Cognitive Level Memory Facility: Salem 1 & 2 ExamDate: 12/15/2014

KA: 026000A405 A4.05 RO Value: 3.5 SRO Value: 3.5 Section: SYS RO Group: 1 SRO Group: 1 55.43

System/Evolution Title Containment Spray System 026

KA Statement: Ability to manually operate and/or monitor in the control room:  
Containment spray reset switches

Explanation of Answers: 55.41(9,7) Containment Spray actuation relays have retentive memory, which allows relays to be manually reset with an actuation signal still present. For this reason, B and C are incorrect because containment pressure is not required to be less than 15 psig. A is incorrect because Phase B is not required to be reset to reset Cont Spray. D is correct because BOTH trains of CS have to be reset, and electrically can be reset regardless of cont pressure.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
RPS Safeguards Initiation Signal	221057- NOTE 10			23

L.O. Number

Objectives

CSPRAYE008

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Direct From Source Used During Training Program

Question Source Comments Q147704

Comment

Question 49

Given the following conditions:

- Salem Unit 1 was operating at 100% power when a LOCA occurred.
- A manual reactor trip and manual SI were initiated.
- When the Main Generator output breakers opened, a loss of off-site power occurred.
- 1A vital bus locked out on bus differential.

Which of the following identifies which Hydrogen Recombiners can be started when directed by procedure if required?

a. 11 ONLY.

b. 12 ONLY.

c. 11 AND 12.

d. Neither Hydrogen Recombiner is available.

Answer: b Exam Level: R Cognitive Level: Application Facility: Salem 1 &amp; 2 ExamDate: 12/15/2014

KA: 028000K201 K2.01 RO Value: 2.5\* SRO Value: 2.8\* Section: SYS RO Group: 2 SRO Group: 2 55.43

System/Evolution Title: Hydrogen Recombiner and Purge Control System 028

KA Statement: Knowledge of bus power supplies to the following:  
Hydrogen recombiners

Explanation of Answers: 55.41.b(9). Hyd recomb are powered from 1A and 1B 460 volt vital buses, which are powered from their respective 4KV vital buses. With 1A bus locked out on diff, 1A 460 will not have power. Only 12 is available.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
1A Aux Building 460V Bus One line	601231			16
1B Aux Building 460V Bus One line	601232			18

L.O. Number

Objectives

CONTMTE004

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Significantly Modified Used During Training Program

Question Source Comments: Q125691 and Q147705 combined

Comment



Question Topic

RO 51

Which of the following would cause an automatic Main Steamline Isolation signal to occur with NO operator action?

- a. An automatic Safety Injection signal occurs on Steamline D/P.
- b. NR level on a single SG rises above 67% with the Unit operating at 75% power.
- c. A Phase A Isolation signal is generated during SSPS testing with the Unit operating at 100% power.
- d. While synchronizing the Main Generator to the grid, steam pressure input signal to Main Steam Dumps fails high.

Answer: d Exam Level: R Cognitive Level: Application Facility: Salem 1 & 2 Exam Date: 12/15/2014

KA: 039000A302 A3.02 RO Value: 3.1 SRO Value: 3.5 Section: SYS RO Group: 1 SRO Group: 1 55.43

System/Evolution Title: Main and Reheat Steam System 039

KA Statement: Ability to monitor automatic operations of the Main and Reheat Steam System including:  
Isolation of the MRSS

Explanation of Answers: Main steam dumps will be in MS Pressure control-auto when synchronizing the generator. Failure of the steam pressure input signal HIGH will result in all steam dumps opening. Steam dumps will pass 52% total steam flow. From 0-20% power, the steamflow setpoint is 40%. It also requires Tavg <543°F or steam pressure <600 psig. With 50% load, Tavg would rapidly lower from where it was at 15-18% power (where we normally synch gen) to < 543. The steam dumps will turn off at 543°, but not before generating the isolation signal.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Licensed Operator Fluency List	NOS05FLUNCY-08			8

L.O. Number

Objectives

MSTEAME015

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Concept Used Used During Training Program

Question Source Comments: Q40425 made into conditions, not just setpoints

Comment



Question Topic RO 53

Which of the following parameters will change in the direction indicated following a Main Turbine trip from 90% power, once new steady state conditions have been reached?

- a. TAC system D/P will be lower.
- b. TAC system supply temp will be lower.
- c. TGA SW header pressure will be higher.
- d. Main Condenser Hotwell levels will be higher.

Answer d Exam Level R Cognitive Level Application Facility: Salem 1 & 2 Exam Date: 12/15/2014

KA: 045000A106 A1.06 RO Value: 3.3 SRO Value: 3.7 Section: SYS RO Group: 2 SRO Group: 2 55.43

System/Evolution Title Main Turbine Generator System 045

KA Statement: Ability to predict and/or monitor changes in parameters associated with operating the Main Turbine Generator System controls including:

Expected response of secondary plant parameters following T/G trip

Explanation of Answers: Turbine aux cooling system D/P is maintained at pre-set setpoint, and automatic valve will operate to maintain it, so actual D/P will not change based on heat load or flow. TGA SW header pressure is regulated by ST1, which maintains downstream pressure of 80 psig, so it will modulate to maintain pressure stable. TAC system HX outlet is controlled at setpoint automatically. Hotwell levels will rise as the turb trip initiates a Rx trip >P-9, and the BF19s and 40's will shut on FW interlock. There will be no "goes out" from the hotwells, but it will still be receiving "goes in" from the Steam dump system from the Main steam system, and the SGs will be fed from the AFW pumps.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
TGA SW system Lesson Plan	NOS05SWTURB-04			04

L.O. Number

Objectives

MNTURBE013

Material Required for Examination

Question Source: New Question Modification Method: Used During Training Program

Question Source Comments

Comment









**Material Required for Examination****Question Source:**

Facility Exam Bank

**Question Modification Method:**

Editorially Modified

**Used During Training Program****Question Source Comments**

Q80316 changed "Rx power rising" to "Rx power >100%", and removed "due to 22SW122 closure" from choice VIII since no other choice has a reason with it.

**Comment**

Question Topic RO 58

During normal operations, each 125 VDC bus is powered from its associated \_\_\_\_\_, and upon a loss of all AC power, the 125 VDC bus \_\_\_\_\_.

- a. battery. remains powered from its battery.
- b. battery. must be manually realigned to its battery.
- c. battery charger. is manually transferred to its battery.
- d. battery charger. is automatically powered from its battery.

Answer d Exam Level R Cognitive Level Memory Facility: Salem 1 & 2 ExamDate: 12/15/2014

KA: 063000K103 K1.03 RO Value: 2.9 SRO Value: 3.5 Section: SYS RO Group: 1 SRO Group: 1 55.43 ☐

System/Evolution Title D.C. Electrical Distribution 063

KA Statement: Knowledge of the physical connections and/or cause-effect relationships between D.C. Electrical Distribution and the following:  
Battery charger and battery

Explanation of Answers: 55.41.b(8) Each battery bus is normally connected to the battery and the battery charger. Since the battery charger is maintained at a higher output voltage than the battery, it continuously supplies a float charge to the battery while supplying all the power needs for the DC bus. When the normal AC power supply is lost to the charger, the battery remains connected to the DC bus and supplies power.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
125 VDC electrical One Line	203007			30

L.O. Number

Objectives

DCELECE003

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Direct From Source Used During Training Program ☐

Question Source Comments Q127100

Comment



RO SkyScraper

SRO SkyScraper

RO System/Evolution List

SRO System/Evolution List

Outline Changes

Question Topic

RO 60

Unit 2 is releasing 22 CVCS Monitor Tank through the cross-connect line to Unit 1 SW, then to Unit 2 CW system.

If a high radiation condition occurs, how will the release will be terminated?

- a. 1WL115 Waste Discharge Hdr x-conn valve will be manually shut.
- b. 2WL115 Waste Discharge Hdr x-conn valve will automatically shut.
- c. 1WL51 Liquid Radwaste Overboard Stop Valve will automatically shut.
- d. 2WL51 Liquid Radwaste Overboard Stop Valve will automatically shut.

Answer: d Exam Level: R Cognitive Level: Memory Facility: Salem 1 & 2 Exam Date: 12/15/2014

KA: 068000A404 A4.04 RO Value: 3.8 SRO Value: 3.7 Section: SYS RO Group: 2 SRO Group: 2 55.43

System/Evolution Title: Liquid Radwaste System 068

KA Statement: Ability to manually operate and/or monitor in the control room:  
Automatic isolation

Explanation of Answers: 55.41.b(11,12) The unit initiating the release will have the flow through its own R18 radiation monitor, and it will auto close on high radiation. Use of the cross connect line does not put flow through the opposite units R18 rad monitor, nor will its isolation valve 1WL51 be opened or in the flowpath. The 2WL115 is a remotely operated valve but does not have an auto close function. The 1WL115 is a normal locked shut manual valve.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Units 1 and 2 Radioactive Liquid Waste	205239-SIMP			2

L.O. Number

Objectives

WASLIQE005

WASLIQE007

Material Required for Examination

Question Source: New Question Modification Method: Used During Training Program

Question Source Comments

Comment























RO SkyScraper

SRO SkyScraper

RO System/Evolution List

SRO System/Evolution List

Outline Changes

Question Topic: RO 72

All of the following are items found on a "Radiation Worker Pocket RWP Data Sheet" as shown in RP-AA-4000, Personnel Conduct in Radiological Controlled Areas EXCEPT:

- a. Dress Requirements.
- b. Task and Work Order.
- c. Year-to-date Accumulated dose.
- d. Electronic Dosimeter Dose Rate Alarm setpoint.

Answer: c Exam Level: R Cognitive Level: Memory Facility: Salem 1 & 2 Exam Date: 12/15/2014

KA: 194001G307 2.3.7 RO Value: 3.5 SRO Value: 3.6 Section: PWG RO Group: 1 SRO Group: 1 55.43

System/Evolution Title: GENERAL

KA Statement:

Ability to comply with radiation work permit requirements during normal or abnormal conditions.

Explanation of Answers: 55.41 b(12) All of the choices are found on RP-AA-4000 except c.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Personnel Conduct in Radiological Controlled Ar	RP-AA-4000		10	4

L.O. Number

Objectives

RADCONE005

Material Required for Examination

Question Source: New Question Modification Method: Used During Training Program

Question Source Comments

Comment

















**Material Required for Examination****Question Source:**

Facility Exam Bank

**Question Modification Method:**

Concept Used

**Used During Training Program****Question Source Comments**

Q42671, used stem, removed parts of choices, added parts to choices, answer contains some original and some new parts.

**Comment**







Material Required for Examination			
Question Source:	New	Question Modification Method:	
Question Source Comments		Used During Training Program <input type="checkbox"/>	
Comment			









Material Required for Examination

Question Source

Previous NRC Exams

Question Modification Method:

Direct From Source

Used During Training Program

Question Source Comments

12/2012 NRC Exam SRO Q11

Comment

## Question Topic

SRO 13

Given the following conditions:

- Unit 2 is performing a cooldown from NOP/NOT IAW EOP-TRIP-4 Natural Circulation Cooldown.
- The RCS has been depressurized to 1245 psig.
- PZR level is 16% and stable.
- RCS cooldown rate is 22°F/hr.
- CETs are 445°F.
- 21 and 22 CRDM vent fans are running.

Which of the following describes how the CRS should proceed, and why?

- a.** Stop cooldown and depressurization and perform an 8 hour soak to prevent upper head void formation while performing additional shutdown activities as directed in S2.OP-IO.ZZ-0006, Hot Standby to Cold Shutdown.
- b.** Continue depressurization in TRIP-4 until <1000 psig, then close 21-24 SJ54, Accumulator Isolation Valves, to prevent injecting accumulator contents into the RCS.
- c.** Initiate SI and go to EOP-TRIP-1, Reactor Trip or Safety Injection, due to the loss of subcooling.
- d.** Start ECCS pumps as necessary to raise PZR level and go to TRIP-1.

Answer: **b** Exam Level: **S** Cognitive Level: **Application** Facility: **Salem 1 & 2** Exam Date: **12/15/2014**

KA: **006000G406** 2.4.6 RO Value: **3.7** SRO Value: **4.7** Section: **SYS** RO Group: **1** SRO Group: **1** 55.43 ☒

System/Evolution Title: **Emergency Core Cooling System**

006

## KA Statement:

Knowledge of EOP mitigation strategies.

## Explanation of Answers:

55.43.b(5) A is incorrect because the 8 hour soak is only required if RCS pressure is < 1250 and < 2 CRDM vent fans are running. IOP-6 actions have already been directed to be performed earlier in the procedure so could be continued here. B is correct because the soak is not required. Continue RCS depress until < 1,000 psig and isolate ECCS Accumulators per step 25, and correct reason. C is incorrect because the CAS action in TRIP-4 to initiate SI is if subcooling cannot be maintained >0, and using CFST Table A its 107°F. D is incorrect because PZR level is being maintained >11% per CAS action, and action would be to initiate SI, not just start ECCS pumps, since full SI actuation would be wanted vs just starting ECCS pumps.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Natural Circulation Cooldown	2-EOP-TRIP-4			23

## L.O. Number

## Objectives

TRP004E001

## Material Required for Examination

SRO 12 CFST Table A Subcooling Table Normal Containment

## Question Source:

Facility Exam Bank

## Question Modification Method:

Editorially Modified

Used During Training Program ☐

## Question Source Comments

Q50353. Modified to include what procedure to use in all choices. Replaced 2 distracters with the ECCS and SI distracters.

## Comment

RO SkyScraper

SRO SkyScraper

RO System/Evolution List

SRO System/Evolution List

Outline Changes

Question Topic SRO 14

Given the following conditions:

- A LOCA has occurred on Unit 2.
- Operators are performing 2-EOP-LOCA-3, Transfer to Cold Leg Recirculation with all equipment and off site power available.
- The crew has isolated the charging pump and SI pump suction from the RWST.
- RWST level is 3.5' and lowering slowly when debris in containment clogs the containment sump, causing all pumps taking suction from it to begin cavitating severely.

What affect will this have on Containment Spray flow, and how will the CRS proceed?

Containment Spray flow will ...

- a. remain above 0 gpm due to one CS pump still taking suction from the RWST. GO TO EOP-LOCA-5, Loss of Emergency Coolant Recirculation, add makeup to the RWST, stop any safeguards pump which has lost its suction source.
- b. remain above 0 gpm due to one CS pump still taking suction from the RWST. GO TO EOP-APPX-7, Containment Sump Blockage Guideline, and stop all operating Charging, SI, and RHR pumps.
- c. lower to 0 gpm due to CS flow being supplied solely from RHR pump discharge. GO TO EOP-LOCA-5 and add makeup to the RWST, stop any safeguards pump which has lost its suction source.
- d. lower to 0 gpm due to CS flow being supplied solely from RHR pump discharge. GO TO EOP-APPX-7 and stop all operating Charging, SI, RHR, and CS pumps.

Answer: b Exam Level: S Cognitive Level: Application Facility: Salem 1 &amp; 2 Exam Date: 12/15/2014

KA: 026000A207 A2.07 RO Value: 3.6 SRO Value: 3.9 Section: SYS RO Group: 1 SRO Group: 1 55.43 ☒

System/Evolution Title Containment Spray System 026

KA Statement: Ability to (a) predict the impacts of the following on the Containment Spray System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation:

Loss of containment spray pump suction when in recirculation mode, possibly caused by clogged sump screen, pump inlet high temperature exceeded cavitation, voiding), or sump level below cutoff (interlock) limit

Explanation of Answers: 55.43.b(5) The correct transition from LOCA-3 when containment sump blockage is causing a loss of ECCS flow is to APPX-7. There is a CAS item in LOCA-3 to go to LOCA-5 if emergency recirculation cannot be established or maintained ONLY if the reason is OTHER than containment sump blockage. With RWST level above 1.2' as stated in stem, 22 CS pump will have been stopped at step 8. the stem states that charging and SI pump suction has been isolated, which occurs at step 14. The crew will be waiting at step 21 until RWST level lowers to 1.2' at which time they would stop the remaining CS pump. (21)

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Containment Sump Blockage Guideline	2-EOP-APPX-7			0
Transfer to Cold Leg Recirculation	2-EOP-LOCA-3			29

L.O. Number

Objectives

CSPRAYE012

Material Required for Examination

Question Source: New Question Modification Method: Used During Training Program ☐

Question Source Comments

Comment

Question Topic: SFD 15

Given the following conditions:

- Unit 2 is 7 days into a refueling outage on June 15th.
- The core is partially offloaded with 7 bundles remaining in the Rx.
- Spent Fuel Pool (SFP) temperature is 124°F.
- SFP level is 5" above normal.
- 21 SFP becomes air bound, trips on motor OL, and can NOT be restarted.
- 22 SFP pump is placed in service with SFP temperature at 138°F.

Which of the following contains both an expected plant response to this failure, and a condition which must be met prior to transferring the remaining fuel bundles into the spent fuel pool?

The SFP...

- a. High level OHA annunciates. 21 SFP cooling pump must be restore to operable status.
- b. High Level OHA annunciates. The 22 SFP must have normal and emergency power supply availability verified.
- c. Demineralizer automatically bypassed flow when 22 SFP was placed in service and demin inlet temp reached 136°F. 21 SFP cooling pump must be restore to operable status.
- d. Demineralizer automatically bypassed flow when 22 SFP was placed in service and demin inlet temp reached 136°F. The 22 SFP must have normal and emergency power supply availability verified.

Answer: a Exam Level: S Cognitive Level: Application Facility: Salem 1 &amp; 2 Exam Date: 12/15/2014

KA: 033000A202 A2.02 RO Value: 2.7 SRO Value: 3.0 Section: SYS RO Group: 2 SRO Group: 2 55.43 ✓

System/Evolution Title: Spent Fuel Pool Cooling System 033

KA Statement: Ability to (a) predict the impacts of the following on the Spent Fuel Pool Cooling System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation:

Loss of SFPCS

Explanation of Answers: 55.43(5) IOP-10, Spent Fuel Pool Manipulations, states (P&L 3.4) that transfer of spent fuel into the SFP is to be suspended until BOTH SFP pumps are OPERABLE. If in service, the demin was removed from service IAW CAS 2.0. OHA C-27 SFP Lvl hi will occur at 6" above normal, and would be expected to occur with a pool heatup of 14 degrees, as noted in CAUTION in AB.SF on top of page 2. The SFP demin does not auto bypass, but is plausible because the CVCS demin does, at 136°F. The SFP demin would have been manually removed from service IAW AB SE CAS item 2.0 when actual or projected SFP temp is 130°F.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Spent Fuel Pool Manipulations	S2.OP-IO.ZZ-0010			32
Loss of Spent Fuel Pool Cooling	S2.OP-AB.SF-0001			11
Overhead Window C	S2.OP-AR.ZZ-0003		32	17

L.O. Number

Objectives

SFP000E013

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Concept Used Used During Training Program ☐

Question Source Comments: Q78659. Changed from only a what must happen before fuel movement can recommence, to what will happen and when can movement recommence to fit 2 part K/A.

Comment

Question Topic

SFC 10

Given the following conditions:

- Unit 2 is performing a Rx startup.
- Rx power is currently stable at 6%.
- 22 SGFP is supplying Main Feed to all S/G's.
- Steam dumps are controlling Tave in MS Pressure control - Manual set at 980 psig.
- All MS10's are closed in AUTO at 1015 psig.
- 23TB40 falls 50% open.
- Auctioneered high RCS Tavg is 540.9°F and slowly lowering.
- PZR pressure is 1984 psig and slowly lowering.

Which of the following describes how the CRS should apply Tech Specs, and why?

Assume no auto Rx trip setpoints are reached.

- a.** Restore RCS Tave to at least 541°F within 15 minutes, or Rx trip breakers must be opened within the next 15 minutes because adequate SDM cannot be assured.
- b.** Restore RCS Tave to at least 541°F within 15 minutes, or Rx trip breakers must be opened within the next 15 minutes because protective instrumentation is not within its normal operating range.
- c.** Restore PZR pressure to at least 1985 psig within 1 hour, or lower Rx thermal power to <5% rated thermal power in the next 4 hours because initial FSAR analysis for minimum DNBR is not met.
- d.** Restore PZR pressure to at least 1985 psig within 1 hour, or lower Rx thermal power to <5% rated thermal power in the next 4 hours because the margin to trip for DNB related protective actions is below the minimum assumed value.

Answer: **b** Exam Level: **S** Cognitive Level: Application Facility: Salem 1 & 2 Exam Date: 12/15/2014

KA: 041000A202 A2.02 RO Value: 3.6 SRO Value: 3.9 Section: SYS RO Group: 2 SRO Group: 2 5543 ✓

System/Evolution Title: Steam Dump System and Turbine Bypass Control 041

**KA Statement:** Ability to (a) predict the impacts of the following on the Steam Dump System and Turbine Bypass Control and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation:  
Steam valve stuck open

**Explanation of Answers:** 55.43.b(2) RCS Tavg is required to be maintained at 541°F or greater in Modes 1 and 2 IAW TSAS 3.1.1.4. If not restored within 15 minutes, the plant must be in Hot Standby in the next 15 minutes, which would be accomplished by opening the RTB's. The bases for this temp is to ensure 5 different things, one of which is that protective instrumentation within its normal range. A is incorrect because SDM margin is not one of the 5 listed bases for minimum temp for criticality. C and D are both incorrect because of the time requirement, which is 2 hours to reach HSB, additionally D is further incorrect because its bases is incorrect.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem Tech Specs				

L.O. Number

Objectives

RCS000E009

Material Required for:

Question Source:

Previous 2 NRC Exams

Significantly Modified

Used During Training Program ☐

Question Source Comments

9/2011 NRC SRO exam Q16. Took info in stem from old Q (that Tavg had to be restored >541) and put that action in the 2 of the choices. Added PZR pressure condition to stem which is below TS limit. So question went from what

Comment

restore Tavg, to what do you do, and why.









RO SkyScraper

SRO SkyScraper

RO System/Evolution List

SRO System/Evolution List

Outline Changes

Question Topic: SRO 21

Of the following, which is the only procedure which can be changed using an On The Spot Change (OTSC) IAW AD-AA-101-101 Implementing and Technical Procedure On-The-Spot Change (OTSC) Process?

- a. OP-SA-108-101-1002, Key Control - Salem.
- b. AD-AA-101, Processing of Procedures and T&RMs.
- c. TQ-AA-104, Initial Licensed Operator Training Program.
- d. SC.OP-ST.CAV-0001, Plant Systems - Control Room Ventilation.

Answer: d Exam Level: S Cognitive Level: Memory Facility: Salem 1 & 2 Exam Date: 12/15/2014

KA: 194001G205 2.2.5 RO Value: 2.2 SRO Value: 3.2 Section: PWG RO Group: 1 SRO Group: 1 55.43 ✓

System/Evolution Title: GENERI

KA Statement:

Knowledge of the process for making design or operating changes to the facility.

Explanation of Answers: 55.41.b(3) Section 1.3.1 and 1.3.2 define when an OTSC can and cannot be used. It cannot be used for an Administrative procedure. It can be used for a Department Implementing procedure

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
IMPLEMENTING AND TECHNICAL PROCEDU	AD-AA-101-101		3	5

L.O. Number

Objectives

MISCAP007

Material Required for Examination

Question Source: New Question Modification Method: Used During Training Program ☐

Question Source Comments

Comment

Question Topic

22

All of the following Post Work Testing requirements are directed in OP-AA-109-115-1001, Work Clearance Management Guide, EXCEPT:

- a. The shop-identified PMT may be the same test performed by Operations to ensure operability.
- b. Adequacy of component/system retests for work performed should be determined by the Maintenance Work Group Supervisor.
- c. The initial Post Maintenance Test (PMT) and Operations Retest (RT) requirements are identified by the cognizant planner for each work order.
- d. When either a PMT or RT can be satisfied by a surveillance test (ST), the surveillance procedure is performed and credit is taken for performing the surveillance.

Answer: b Exam Level: S Cognitive Level: Memory Facility: Salem 1 & 2 Exam Date: 12/15/2014

KA: 194001G219 2.2.19 RO Value: 2.3 SRO Value: 3.4 Section: PWG RO Group: 1 SRO Group: 1 55.43 ✓

System/Evolution Title

GENERAL

KA Statement:

Knowledge of maintenance work order requirements.

Explanation of  
Answers:

55.43.b(1,5) All the distracters are part of Step 5.1.9, page 22, of the Work clearance Management Guide. B is incorrect because a SRO is responsible for determining the adequacy of the PMT, not the Work Group supervisor

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Work Clearance Management Guide	OP-AA-109-115-1001		22	1

L.O. Number

Objectives

ELO\_15.a

Material Required for Examination

Question Source: New

Question Modification Method:

Used During Training Program ☐

Question Source Comments

Comment





