RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic: RO 1

Unit 1 completed a rapid down power from 100% to 60% 1 hour ago due a SGFP problem.

With Rod Control in automatic, which one of the following conditions would require entry into S1.OP-AB.ROD-0003, Continuous Rod Motion?

a. Control rods step OUT 2 steps at 8 spm with Tave-Tref deviation of 0.0 degrees.

b. Control rods begin stepping IN at 18 spm with a Tave-Tref deviation of plus 1.0 degrees.

c. Control rods begin stepping OUT at 8 spm with a Tave-Tref deviation of minus 1.5 degrees.

d. Control rods step IN at 40 spm with a Tave-Tref deviation of +4.0 degrees following a small load rejection.

Answer: b **Exam Level:** R **Cognitive Level:** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 000001K206 AK2.06 **RO Value:** 3.0* **SRO Value:** 3.1 **Section:** EPE **RO Group:** 2 **SRO Group:** 2 55.43

System/Evolution Title: Continuous Rod Withdrawal 001

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

Explanation of Answers: 55.41.b(5,10) B is correct because control rods are not expected to begin automatically stepping until Tave-Tref reaches 1.5 degrees, either + or -. Additionally, following a downpower, Xenon will be building in and rod motion would be expected to be in the outward direction. C is incorrect because of B explanation above. C is incorrect because steady state rod stepping of 3 steps or less is not entry condition to ROD-3. D is incorrect because following a load rejection, Tavg is expected to rise. The rod speed program starts rod movement at 8 spm at a Terr of 1.5 degrees, remains at 8 spm until Terr of 3 degrees, then rises linearly to 72 spm from 3-5 degrees Terr.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Continuous Rod Motion	S1.OP-SO.ROD-0003			17
T Auction and Rod Control	220429			2

L.O. Number

ABROD3E001

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 2

Given the following conditions:

- Unit 2 is holding Rx power at 1x10-8Amps during a Rx startup.
- A single shutdown bank control rod drops fully into the core.
- IRNI SUR becomes negative, and IR power is lowering.

Which of the following describes why ALL Control Rods will be manually inserted IAW S2.OP-AB.ROD-0002, Dropped Rod?

a. RCS Tavg will lower below the point at which the Rx is allowed to remain critical.

b. Attempting to recover the dropped rod would constitute an approach to criticality.

c. A Tech Spec shutdown is required per 3.1.3.1, Movable Control Assemblies Group Height.

d. Insufficient time is available to stop the power reduction prior to the automatic re-energization of the Source Range NI's and subsequent Rx trip.

Answer	b	Exam Level	R	Cognitive Level	Memory	Facility:	Salem 1 & 2	ExamDate:	5/17/2010

KA:	000003K304	AK3.04	RO Value:	3.8*	SRO Value:	4.1*	Section:	EPE	RO Group:	2	SRO Group:	2	55.43

System/Evolution Title: Dropped Control Rod 003

KA Statement: Knowledge of the reasons for the following responses as they apply to Dropped Control Rod:
Actions contained in EOP for dropped control rod

Explanation of Answers: 55.41.b(5,6,10) S2.OP-AB.ROD-0002, Step 3.4 asks if the Rx is subcritical as a result of the dropped rod. The conditions in the stem indicate it is. The procedure then directs insertion of all control rods. The Bases Document states that the reason rods are inserted is that an attempt to recover the dropped rod in AB.ROD-2 would constitute an approach to criticality. In addition to the above reason, the distracters are incorrect because: A is incorrect because temperature would not drop to 541 on the insertion of a single control rod at 1X10-8 Amps. C is incorrect because a single control rod being inoperable does not require a unit shutdown. D is incorrect because the Rx would not trip when the source range energized since the SR counts would be below the trip setpoint.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Dropped Rod(AND Technical Bases Document)	S2.OP-AB.ROD-0002			10

L.O. Number
ABROD2E002

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 3

Given the following conditions:

- Unit 1 is at 74% reactor power.
- Control Bank D rod 1D1 was at 178 steps.
- Remaining Control Bank 'D' rods are at 198 steps.
- Control Room crew has entered, S1.OP-AB.ROD-0001(Q) Immovable/Misaligned Control Rod, and actions to realign the rod have been completed.
- During the realignment of the rod, the P/A converter was NOT set to actual bank position as required in the procedure.
- Subsequently, a plant transient occurs and rods begin to drive in until OHA E-8, Rod Insertion Limit LO, actuates.

Relative to the ACTUAL Rod Insertion Limit, at what rod height will the alarm actuate? Would this be conservative or non-conservative? Why?

a. Alarm will actuate 10 steps BELOW Rod Insertion Limit. This would be nonconservative since adequate Shutdown Margin will NOT be assured.

b. Alarm will actuate 10 steps BELOW Rod Insertion Limit. This would be nonconservative since the ejected rod analysis assumes all control rods are positioned within 12 steps of the Group Demand Counter <85% power.

c. Alarm will actuate 30 steps ABOVE Rod Insertion Limit. This would be conservative since the alarm would still provide early warning of an inadvertent dilution.

d. Alarm will actuate 30 steps ABOVE Rod Insertion Limit. This would be conservative since acceptable axial/radial flux profiles will be maintained, and radial peaking factors will be NOT be excessive.

Answer a | **Exam Level** R | **Cognitive Level** Application | **Facility:** Salem 1 & 2 | **ExamDate:** 5/17/2010

KA: 000005K302 | AK3.02 | **RO Value:** 3.6 | **SRO Value:** 4.2 | **Section:** EPE | **RO Group:** 2 | **SRO Group:** 2 | 55.43

System/Evolution Title: Inoperable/Stuck Control Rod | 005

KA Statement: Knowledge of the reasons for the following responses as they apply to Inoperable/Stuck Control Rod:
Rod insertion limits

Explanation of Answers: 55.41.b(6) A is correct because all CBD rods except 1D1 would be disconnected from the bank and 1D1 withdrawn 20 steps. If the P/A converter is not reset, anything fed from the P/A converter, such as the RIL computer, will see the Bank at 218 steps (198 to begin with plus an additional 20 steps to align 1D1). Thus the total error is 20 steps in a non-conservative direction. The LOW alarm is set to alarm at 10 steps above the Rod Insertion LIMIT. Thus, if the alarm is 20 steps non-conservative, the alarm will actuate 10 steps BELOW the actual limit. Loss of SDM is bases for RIL. B is incorrect because the reason is incorrect. The rod ejection accident reactivity effect is part of the bases for the RIL, but FSAR Section 15.4.7 for Rod Control Cluster Assembly Ejection refers to entire control bank position relative to the RIL or fully inserted for reactivity associated with the ejected rod. Additionally, operators would have reduced power to at least 75% in AB.ROD-01, and the requirement is =/- 18 steps <85% power. C and D are incorrect because if it is assumed that the 20 step disagreement should be added to the 10 step alarm, 30 steps above the limit is plausible. An inadvertent dilution could cause rods to step in too far and thus cause this alarm. Rod position impact on Axial Flux is plausible, since having the rods inserted too far will cause AFD issues.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Immovable/Misaligned Control Rod	S1.OP-AB.ROD-0001	Bases Document	5 of 6	6
Salem UFSAR		Section 15 Accident An	15.4-72,7	6,23,18
Rod Control and Position Indications Systems	NOS05RODS00-10		50-52	10

L.O. Number
ABROD1E002

Objectives

Material Required for Examination					
Question Source:	Facility Exam Bank	**Question Modification Method:**	Editorially Modified	**Used During Training Program**	☐
Question Source Comments	Q80307, modified to ensure more than 1 concept mastery is required to correctly answer question.				

Comment

Additional Reference Material, S1.OP-AR.ZZ-0005, OHA Window E, Rev. 16 pages 11-12

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 4

Which one of the following actions does NOT automatically occur within the first minute following a Unit 2 Rx trip from 40% power?

a. Main Power Transformers Group 1 cooler turns off.

b. 1-9 and 9-10 Generator Output 500 KV breakers open.

c. RCP power supply busses transfer to their alternate source of power.

d. 4KV Vital Busses power supplies transfer to their alternate (not emergency) source of power.

Answer d | **Exam Level** R | **Cognitive Level** Memory | **Facility:** Salem 1 & 2 | **ExamDate:** 5/17/2010

KA: 000007K202 | EK2.02 | **RO Value:** 2.6 | **SRO Value:** 2.8 | **Section:** EPE | **RO Group:** 1 | **SRO Group:** 1 | 55.43

System/Evolution Title: Reactor Trip | 007

KA Statement: Knowledge of the interrelations between Reactor Trip and the following:
Breakers, relays and disconnects

Explanation of Answers: 55.41.b(10) For the Rx to be operating at 40% power, the Main Turbine must be online and the Main Generator outputting to the grid. When the Rx trips, the Main Generator output breakers always trip. (While a main turbine/generator trip does not ALWAYS cause a Rx trip, a Rx trip ALWAYS causes a Main Turbine/Generator trip. The 40% indicated in the stem is below the P-9(49% power)setpoint at which a Main Turbine trip does NOT cause a Rx trip. The Main Generator Exciter Field Breaker trips when the Main Turbine trips. The EFB is interlocked with the Group 1 coolers on the Main Power Transformers, and the Group 1 coolers will stop. The RCPs are powered from the 4KV Group Busses, which are powered form the output of the Main Generator when operating. When the Main Generator trips on the Rx trip, the Group busses automatically swap to off-site power. The 4KV vital busses are powered from off-site power and do not swap power supplies on a Rx trip/Main Turbine Generator trip.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Main Power Transformer Cooling	S2.OP-SO.4kv-0004			6
Reactor Protection System RX Trip Signals	221051			13

L.O. Number

TRP001E021

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 5

Given the following conditions:

- Unit 1 is operating at 100% power.
- A very small leak develops on 2PR3, PZR Code Safety Valve.
- PZR tailpipe temperature has stabilized at 228 degrees.
- PRT pressure is 5.3 psig.

Which of the following identifies a condition which will result in PZR tailpipe temperature rising?

a. The PRT is partially drained.

b. PZR pressure drifts 1 psig higher.

c. The PRT rupture disk develops a leak.

d. Additional nitrogen cover gas is added to the PRT.

Answer d **Exam Level** R **Cognitive Level** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 000008K101 AK1.01 **RO Value:** 3.2 **SRO Value:** 3.7 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Pressurizer Vapor Space Accident 008

KA Statement: Knowledge of the operational implications of the following concepts as they apply to Pressurizer Vapor Space Accident: Thermodynamics and flow characteristics of open or leaking valves

Explanation of Answers: 55.41.b(3,5)The pressure drop across the Safety Valve will cause the downstream pressure to equal that in the PRT. Enthalpy will be constant. The fluid in the tailpipe will be at saturation temperature for the temperature in the PRT. The tailpipe temp is raised by raising PRT pressure. A is incorrect because any draining in the PRT would tend to allow the gas in the PRT to expand into the vacated area and cause pressure to go down. B is incorrect because the pressure seen in the upstream side does not control the saturation temperature on the downstream side. C is incorrect because it would cause PRT pressure to lower. D is correct because nitrogen is added to the PRT as a cover gas, and if more were added it would cause PRT pressure to rise and saturation temp to rise also.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Mollier Diagram				

L.O. Number | Objectives

PZRPRTE004

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 6

Given the following conditions:

- Unit 1 was operating at 100% power EOL when a 70 gpm leak developed in the RCS.
- Operators tripped the Rx and initiated a Safety Injection.
- When the Main Turbine automatically tripped following the Rx trip, all Off-Site power deenergized.

Which of the following describes how SG pressure will be controlled?

a. SG Atmospheric Relief Valves 11-14MS10s will modulate as required to maintain SG pressure at 1015 psig.

b. Main Steam Dumps will modulate in the Main Steam Pressure Control Mode as required to maintain SG pressure at 1005 psig.

c. Main Steam Dumps will modulate in the Plant Trip Controller Mode as required to maintain RCS Tavg at 547 deg, and SG pressure will be at saturation pressure for RCS Loop Tc.

d. SG pressure will be maintained less than the setpoints for automatic opening of both the Main Steam Dump Valves AND the SG Atmospheric Release Valves by the injection of cold ECCS water into the RCS.

Answer a **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 000009A114 EA1.14 **RO Value:** 3.4 **SRO Value:** 3.4 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Small Break LOCA 009

KA Statement: Ability to operate and / or monitor the following as they apply to Small Break LOCA: Secondary pressure control

Explanation of Answers: 55.41.b(4)Steam Generator pressure control after a normal Rx trip can be from Main Steam Dumps or SG Atmospheric Relief valves. Normally, the Main steam dumps will ARM from the P-4 signal, and the steam dumps will modulate as required to maintain RCS Tavg at 547 deg, with RCS loop Tc lower than Th due to the residual power still being made in the Rx. This Tc temperature will dictate what the SG pressure is. However, when off-site power became deenergized, power was lost to all the Unit 1 Circulators. At least one of 2 circulators per condenser waterbox must be in operation to allow steam dumps to be armed and allow valve opening. Since NO circulators will be operating, steam dumps will not be available. Distracter D is indicative of the SG pressure trend following a substantive LOCA where the ECCS injection flow is of a magnitude that would lower RCS temperature to such a degree that SG pressure would lower in response to the colder water flowing through the u-tubes. MS-10 valve are set at 1015 psig in Auto during plant startup.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
S1.OP-SO.MS-0002	Steam Dump System Operation		2	9
S1.OP-IO.ZZ-0003	Hot Standby to Minimum Load		23	

L.O. Number
LOCA01E003
LOCA01E008

Objectives

Material Required for Examination	

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

Question Source Comments	

Comment

Question Topic RO 7

Given the following conditions:

- Unit 2 is in Mode 3.
- A cooldown to Mode 5 is in progress due to RCS back leakage into 23 SI Accumulator.
- RCS Tavg is 540°F.
- RCS pressure is 2200 psig.
- 23SJ54 Accumulator Isolation Valve is selected to VALVE OPERABLE on 2RP4.
- 23SJ54 was shut from the control room and power remains available to the valve.

Which of the following describes the response of the 23SJ54 if a Design Basis LOCA occurs on 22 Loop Cold Leg?

a. 23SJ54 opens automatically.

b. 23SJ54 remains closed. The RO must depress the 23SJ54 OPEN pushbutton 2CC1.

c. 23SJ54 remains closed. The RO must rotate 23SJ54 RECIRC-OVERIDE-OPEN switch to OPEN on 2RP4.

d. 23SJ54 remains closed. The 230V control power breaker must be cycled to permit automatic opening.

Answer a **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 000011A113 EA1.13 **RO Value:** 4.1* **SRO Value:** 4.2 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Large Break LOCA 011

KA Statement: Ability to operate and / or monitor the following as they apply to Large Break LOCA:
Safety injection components

Explanation of Answers: 55.41.b(8,7) As shown on marked up dwg 217127, the 23SJ54 will always open when it receives an OPEN signal REGARDLESS of the position of the Power Lockout Switch(Valve operable or Lockout).The lockout portion of the circuit applies to the CLOSING circuit only. B is plausible if operator doesn't understand that as long as power is available, the SJ54 will open on a SI signal. C is plausible since there are RECIRC-OVERIDE switches for other valves located on 2RP4 in the same section. D is plausible because other RPS components require "cycling" of breakers to allow operation.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
217127	23 Accumulator Control Valves			28

L.O. Number Objectives

ECCS00E004

Material Required for Examination

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

Question Source Comments Q80574, removed the basis portion and made it strict SJ54 operation question.

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 8

Which of the following describes the effect of a total failure of the indicated RCP seal(s)?

Failure of...

a. the #1 seal would be indicated by a low #1 seal leakoff flow condition with a corresponding rise in #2 seal leakoff flow.

b. the #2 seal would be indicated by a high #2 seal leakoff flow condition with a corresponding rise in #1 seal leakoff flow.

c. the #3 seal would be indicated by an rise in the makeup requirement to the RCP standpipe.

d. ANY RCP seal will result in rising radiation levels in containment.

Answer	c	**Exam Level**	R	**Cognitive Level**	Memory	**Facility:**	Salem 1 & 2	**ExamDate:**	5/17/2010

KA:	000015K207	AK2.07	**RO Value:**	2.9	**SRO Value:**	2.9	**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:
RCP seals

Explanation of Answers: 55.41.b(3,10) A is incorrect because when the number 1 seal fails, it means that there is no resistance to flow across that seal anymore, so seal leakoff flow will rise because more flow is getting to the downstream side of #1 seal. #2 seal leakoff flow would rise, but there is no direct indication of it, and the first part of distracter is wrong anyways. B is incorrect because the #2 seal failure would not affect the #1 seal leakoff, which is based on #1 seal supply pressure. C is correct because failure of the #3 seal means less backpressure on the #2 seal, so less water would be going to standpipe because more water would be flowing through the failed #3 seal. D is incorrect because only a failure of the #3 seal would affect containment radiation levels, since the remaining 2 seals flow to closed systems, VCT for #1 leakoff and Standpipe to liquid waste collection system.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Reactor Coolant Pump Lesson Plan	NOS05RCPUMP-09	Attachment 1		9

L.O. Number
RCPUMPE017

Objectives

Material Required for Examination

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

Question Source Comments Q111143, replaced second #2 seal failure with ANY RCP distracter.

Comment

Modified stem by adding total to the type of seal failure

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 operating at 80% power.
- Normal Letdown is secured, and Excess Letdown is in service.
- PZR level is on program and stable.

Which of the following, if left uncorrected, would result in cavitation of the operating charging pump?

a. 2CV132, EX LTDWN FCV, fails shut.

b. 2CV40 OR 2CV41, VCT OUTLET STOP VALVES, are shut.

c. 2CV35, VCT 3 WAY INLET V, fails to the FLOW TO HUT position.

d. 2CV134, EXC LTDWN 3 WAY VALVE, placed in FLOW TO RCDT position.

Answer	b	**Exam Level**	R	**Cognitive Level**	Comprehension	**Facility:**	Salem 1 & 2	**ExamDate:**	5/17/2010

KA:	000022A202	AA2.02	**RO Value:**	3.2	**SRO Value:**	3.7	**Section:**	EPE	**RO Group:**	1	**SRO Group:**	1	55.43	☐

System/Evolution Title: Loss of Reactor Coolant Makeup — 022

KA Statement: Ability to determine and interpret the following as they apply to Loss of Reactor Coolant Makeup:
Charging pump problems

Explanation of Answers: 55.41.b(5) With the stem condition that PZR level is stable, charging and letdown must be equal. Excess letdown comes from the RCS to the charging pump suction via the seal return to the VCT, upstream of the CV40 and 41. D is incorrect because changing the CV134 to flow to RCDT will not cause cavitation, since excess letdown design flow is only 25 gpm, the makeup system will be able to maintain VCT level, and that is what the charging pumps will be drawing their suction from. A is incorrect because the loss of excess letdown flow (25 gpm) can be made up by the CVCS makeup system. C is incorrect because the Normal Letdown flow path is isolated, and the Excess Letdown flowpath is not in the normal letdown line. B is correct because if the CV40 or 41 (in series valves) shuts, then the suction flowpath to the charging pumps is isolated. The auto swap to the RWST for charging pump suction on lo lo VCT level will NOT occur because excess letdown is still going into the VCT, causing level to rise with no outlet path to the charging pump suctions.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Chemical and Volume Control	2052328	Sheets 1,2,3		56,66,40

L.O. Number
CVCS00E006
CVCS00E008
CVCS00E015

Objectives

Material Required for Examination					
Question Source:	Facility Exam Bank	**Question Modification Method:**	Editorially Modified	**Used During Training Program**	☐
Question Source Comments	Q79822				

Comment
Removed "none of the above" and added CV132 distracter

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic: RO 10

Given the following conditions:

- Unit 2 is in MODE 4.
- 21 RHR loop is supplying shutdown cooling.
- 22 RHR loop is aligned for ECCS.
- 21 RHR pump trips.

During the crew's response operators start 22 RHR pump.

Which ONE of the following is the MINIMUM required stable 22 RHR pump flow established by S2.OP-AB.RHR-0001, Loss of RHR?

a. 500 gpm.

b. 1000 gpm

c. 1800 gpm.

d. 3000 gpm.

Answer	c	**Exam Level**	R	**Cognitive Level**	Memory	**Facility:**	Salem 1 & 2	**ExamDate:**	5/17/2010

KA:	000025A109	AA1.09	**RO Value:**	3.2	**SRO Value:**	3.1	**Section:**	EPE	**RO Group:**	1	**SRO Group:**	1	55.43

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

KA Statement: Ability to operate and / or monitor the following as they apply to Loss of Residual Heat Removal System:
LPI pump switches, ammeter, discharge pressure gauge, flow meter, and indicators

Explanation of Answers: 55.41.b.(10,8). The minimum required stable pump flow is 1800 gpm, regardless of other conditions which may be required in the AB. The range of flow required by AB.RHR-1 is 1800-3000 gpm, and the AB flowpath will terminate at step 3.68, where flow is verified at 1800 – 3000 gpm. There are several additional conditions which have to be met to exit the AB, which are temperature stable or dropping, RCS level >97.5', and at least one RHR pump running. A is plausible because it is the flow which goes through the automatically opening RHR minimum flow valves 22RH29. B is plausible because it is the Tech Spec required minimum flow. D is plausible because it is the upper end of the required flow band.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of RHR	S2.OP-AB.RHR-0001			17
Initiating RHR	S2.OP-SO.RHR-0001		6	24

L.O. Number | Objectives

ABRHR1E005

Material Required for Examination:

Question Source: Other Facility | **Question Modification Method:** Concept Used | **Used During Training Program** ☐

Question Source Comments: Palisades 8/2003 NRC Exam

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 11

Given the following conditions:

- Unit 2 is operating at 100% power.
- 21 CC pump is C/T.
- 21CC HX SW flow control is in manual for a Waste Liquid Release.
- Operators receive 2CC1 Console Alarm 21(22) CC HDR PRESSURE LO.

If the cause of the low pressure condition is a CCW leak on the discharge flange of 23 CCW pump, which of the following control room indications would also be present within 5 minutes after the alarm is received?

Assume the CCW pump(s) in service continue to run, and NO operator action is taken.

a. In service CVCS HUT level rising.

b. The standby CCW pump will have auto started.

c. 21/22 RHR HX CCW FLOW LO alarms have annunciated.

d. 2CC71, LTDWN HX CC CONT VALVE, demand has risen.

Answer d **Exam Level** R **Cognitive Level** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 000026G145 2.1.45 **RO Value:** 4.3 **SRO Value:** 4.3 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Loss of Component Cooling Water 026

KA Statement: Ability to identify and interpret diverse indications to validate the response of another indication.

Explanation of Answers: 55.41.b(8) A is incorrect because floor drain collection in the Aux Building is directed to the WHUT for collection, not the CVCS HUTs. B is incorrect because with the unit at power, there will normally be 2 CCW pumps running. The 3rd pump is normally in standby, but in the stem is tagged out. C is incorrect because the alarms will already be locked in because the CC16s are shut at power. It will not annunciate. D is correct because the 2CC71 is an air operated, fail closed valve. Its valve demand will rise, calling for more opening of the valve, as CCW flow through the Letdown HX has lowered due to the leak.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Control Console 2CC1	S2.OP-AR.ZZ-0011		92	56

L.O. Number

ABCC01E001

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 12

Given the following conditions:

- Unit 2 operators have just entered 2-EOP-FRSM-1, Response to Nuclear Power Generation.
- Step 6 concerning SI Component alignment is contained in a double bordered box, inside a shaded rectangular box.

Which of the following describes the significance of the layout of this step?

Step 6 is...

a. an Action Step. Operators will answer a yes/no question and branch to the right or left based on the answer.

b. a Continuous Action Step. Its action applies from the time the procedure is entered until the end of the procedure.

c. a Continuous Action Step. Its action applies from the first time the step is reached through the end of the procedure.

d. an Action Step. It is performed once when encountered. It must be initiated, but is not required to be completed prior to moving on to the next step.

Answer c **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 000029G414 2.4.14 **RO Value:** 3.8 **SRO Value:** 4.5 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Anticipated Transient Without Scram 029

KA Statement:

Knowledge of general guidelines for EOP usage.

Explanation of Answers: 55.41.b.(10) A is incorrect because the description is of a Decision step. B is incorrect because it is a correct description of an action contained in the Continuous Action Summary, of which there is NOT one in FRSM. D is incorrect because it is the correct description of an Action step.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Use of Procedures	OP-AA-101-111-1003		12-13	1
Response to Nuclear Power Generation	2-EOP-FRSM-1			24

L.O. Number

FRSM00E007

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 13

Given the following conditions:

- Unit 1 is performing a Rx startup by control rods IAW S1.OP-IO.ZZ-0003, Hot Standby to Minimum Load.
- Both IRNI 1N35 and 1N36 have just come on scale at 1X10-11 Amps.
- A failure in the Permissive P-10 circuitry causes the "Power Above P-10" logic to be satisfied.

Which of the following identifies the status of the SRNI indication?

BOTH Source Range NI's read _____ on 1CC2, and actual Source Range counts in the Rx are _____.

a. 0 cpm; 4,000 cpm.

b. 0 cpm; 9,000 cpm.

c. 4,000 cpm; 4,000 cpm

d. 9,000 cpm; 9,000 cpm.

Answer	Exam Level	Cognitive Level	Facility:	ExamDate:
a	R	Application	Salem 1 & 2	5/17/2010

KA:		RO Value:	SRO Value:	Section:	RO Group:	SRO Group:	
000032A203	AA2.03	2.8	3.1*	EPE	2	2	55.43

System/Evolution Title: Loss of Source Range Nuclear Instrumentation | 032

KA Statement: Ability to determine and interpret the following as they apply to Loss of Source Range Nuclear Instrumentation:
Expected values of source range indication when high voltage is automatically removed

Explanation of Answers: 55.41.b(7,5) The Source Range nuclear Instrumentation is not designed to be in service greater than 1E5 cps due to the extremely high voltage which will be developed at this power. SRNI high voltage is normally manually removed from the instruments when adequate IRNI overlap is observed during a startup. As a backup to this, an automatic signal is sent when 2/4 PRNIs read 10% power. (P-10). The stem conditions indicate this backup has occurred due to a malfunction, and will deenergize the SR NIs. This will cause control console indication to read zero. The stem also states that IRNIs have just come on scale at 1x10-11 Amps. S1.OP-IO.ZZ-0003 states that SR to IR overlap should occur between 3.0E3 and 5.0E3 cps in the SR. A is correct. B is incorrect because of the high SR counts. C is incorrect because SR counts on the Control Console will be 0, and D is incorrect because console indication and actual counts are wrong.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Hot Standby to Minimum Load	S1.OP-IO.ZZ-0003		27	23

L.O. Number | Objectives

ABNIS1E001

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 14

Which of the following describes an action that will occur or be directed, based on Area Radiation Monitors, for a Fuel Handling Incident regardless of whether it occurs in Containment or in the Fuel Handling Building?

a. Automatic isolation of affected areas ventilation systems.

b. Automatic re-alignment of affected areas ventilation systems to maximize charcoal filter flow.

c. If radiation levels reach 1R/hr in the affected area requires ALL personnel are to exit the affected area.

d. If radiation levels reach 100 mrem/hr in the affected area requires non-essential personnel to exit the affected area.

Answer c **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 000036A201 AA2.01 **RO Value:** 3.2 **SRO Value:** 3.9 **Section:** EPE **RO Group:** 2 **SRO Group:** 2 55.43

System/Evolution Title: Fuel Handling Incidents 036

KA Statement: Ability to determine and interpret the following as they apply to Fuel Handling Incidents:
ARM system indications

Explanation of Answers: 55.41.b(11) A and B are incorrect because FHB ventilation will re-align through charcoal filters and start all exhaust fans, containment will not realign automatically. C is correct because CAS of AB.Fuel states such. D is incorrect because upon a fuel handling incident, all non-essential personnel are directed to leave area at beginning of procedure, no radiation level is checked, it is always performed.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Fuel Handling Incident	S2.OP-AB.FUEL-0001			5
Abnormal Radiation	S2.OP-AB.RAD-0001			27

L.O. Number
ABFUEL01E002

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 15

Given the following conditions:

- Unit 2 has experienced a 10 gpm tube leak on 24 SG while operating at 45% power.
- A unit S/D is to be performed per management direction.

Which of the following identifies how the CVCS system will be operated IAW S2.OP-AB.SG-0001, Steam Generator Tube Leak, during the shutdown, and why?

a. Leave the Charging System Master Flow Controller in AUTO. This will maintain PZR level on program.

b. Place the Charging System Master Flow Controller in MANUAL and maintain PZR level 35-70%. This will prevent letdown isolation when the reactor is tripped.

c. Ensure charging flow remains >65 gpm in Manual or Auto control. This will prevent flashing in the letdown line when the second orifice is placed in service.

d. Ensure charging flow remains >87 gpm in Manual or Auto control until the reactor is tripped. This ensures the RIL is not violated while initiating a continuous boration via the makeup system.

Answer b | **Exam Level** R | **Cognitive Level** Memory | **Facility:** Salem 1 & 2 | **ExamDate:** 5/17/2010

KA: 000038K306 | EK3.06 | **RO Value:** 4.2 | **SRO Value:** 4.5 | **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:
Actions contained in EOP for RCS water inventory balance, S/G tube rupture, and plant shutdown procedures

Explanation of Answers: 55.41.B(10) Step 3.26A directs charging flow to be placed in manual and PZR level maintained 35-70%. This ensures that sufficient inventory exists to prevent PZR level from shrinking below 17% when the reactor is tripped and RCS cooldown is initiated. Keeping flow in AUTO is incorrect. Flashing in the letdown line is always a concern, but flow will not be controlled for this reason. RIL are always a concern, and a continuous boration may be performed while performing the S/D, but 87 gpm is not a limit for charging flow that is directed by this procedure.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Steam Generator Tube Leak	S2.OP-AB.SG-0001	Step 3.26A and Bases		27

L.O. Number

ABSG01E003

Objectives

Material Required for Examination

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

Question Source Comments Vision Q57117. Modified distracters to remove run on sentences and make each choice more uniform.

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 16

Given the following conditions:

- Unit 1 is operating at 100% power.
- A large steamline break occurs at the Mixing Bottle.

Which of the following identifies why the Bleed Steam Check Valves shut following the Main Turbine trip?

a. To ensure that Gland Seal & Heating Steam System Header does not become over pressurized.

b. To prevent steam backflow from the Feedwater Heaters to the Main Turbine preventing turbine overspeed

c. To prevent Main Condenser vacuum degradation to the point where Main Steam Dumps would become unavailable.

d. To ensure any steam remaining in the Main Steamline after MSLI is directed to the Main Condenser for secondary inventory control.

Answer b **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 000040K303 AK3.03 **RO Value:** 3.2* **SRO Value:** 3.5* **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Steam Line Rupture 040

KA Statement: Knowledge of the reasons for the following responses as they apply to Steam Line Rupture:
Steam line non-return valves

Explanation of Answers: 55.41.b(4) Bleed steam check valves are allowed to open during Main Turbine startup at step 5.5.23 of S2.OP-SO.TRB-0001. Following a turbine trip (ASO<45 psig), the check valves piston operator releases the valves to drop into the steam flow stream. As flow starts to reverse the check valves are then free to shut, to prevent the energy stored in the Feedwater Heaters to back flow into the Main Turbine and cause turbine overspeed.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Bleed Steam, Feedwater Heaters, Vents and Dr	NOS05BSTEAM-03		29	3

L.O. Number

BSTEAME004

Objectives

Material Required for Examination

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

Question Source Comments Vision QL1420. Modified distracters for continuity, replaced C and D with new distracters.

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 17

Given the following condition:

- Unit 2 was operating at 100% power when a total loss of all AC power occurred.
- 15 minutes after the power loss, operators have locally started 2B EDG.

Which of the following is an action that is REQUIRED to have been performed PRIOR to energizing 2B 4KV Vital bus, and why?

a. Shed non-essential DC loads to extend the time the Vital Instrument Inverters can power their AC loads.

b. Initiate and reset SI to prevent the auto start of a centrifugal charging pump and possible thermal shock to the RCP seals.

c. Deenergize ALL SECs and depress stop PBs for SEC actuated components to prevent overloading the 2B 4KV vital bus.

d. Start the Station Blackout Compressor to provide air for operation of 21-24AF11, AUX FEED-S/G LEVEL CONTROL VLVS, to prevent over feeding the SGs when 22 AFW pp starts.

Answer c **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 000055A203 EA2.03 **RO Value:** 3.9 **SRO Value:** 4.7 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Station Blackout 055

KA Statement: Ability to determine and interpret the following as they apply to Station Blackout:
Actions necessary to restore power

Explanation of Answers: 55.41.b(10) The Continuous Action Step for energizing a denenergized vital bus with an EDG comes AFTER the step to deenergize all SEC's. The Bases Document states on page 15 that the reason to deenergize the SECs and depress the Stop PB for all SEC controlled safety related loads is to prevent the bus from overloading. It additionally states that a further reason is to prevent charging pump automatic start and possible thermal shock to the RCP seals. SI is initiated at Step 21 NOT to prevent a charging pump from running, but rather to prevent the SI actuated valve realignment that will occur if an SI signal is sensed after power is restored. Non essential DC loads are shed at Step 35 to extend the batteries power capability. The SBO is started as part of Blackout Coping Actions in Attachment 2 Part A of AB.LOOP-1. All the distracters are actions which will be taken during an extended loss of all AC power, but the correct answer is the only one that is required to be performed AND has the correct reason for doing it prior to power restoration. D will be performed, but it is NOT the correct reason, and is required within 60 minutes of Blackout. A and B will be performed, but are not required to be performed prior to power restoration.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of All AC Power	2-EOP-LOPA-1			26

L.O. Number
LOPA00E007

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

Salem Unit 2 is operating at 45% power when a loss of off-site power occurs.

Which of the following "F" Window OHAs came in FIRST?

a. F-2, RC LO FLO & P-8.

b. F-36, TURB TRIP & P-9.

c. F-33, PR NEUT FLUX RATE HI.

d. F-26, 4KV GRP BUS UNDRVOLT.

Answer: d | **Exam Level:** R | **Cognitive Level:** Application | **Facility:** Salem 1 & 2 | **ExamDate:** 5/17/2010

KA: 000056A235 | AA2.35 | **RO Value:** 4.1 | **SRO Value:** 4.1 | **Section:** EPE | **RO Group:** 1 | **SRO Group:** 1 | 55.43

System/Evolution Title: Loss of Off-Site Power | 056

KA Statement: Ability to determine and interpret the following as they apply to Loss of Off-Site Power:
Reactor trip alarm

Explanation of Answers: 55.41.B(7) A is incorrect because the setpoint is <90% design flow with power >P-8 (36% power). The RCPs have a huge flywheel specifically designed to maintain pump speed as high as possible during coastdown, so there will not be an instantaneous drop of loop flow. B is incorrect because the Rx trip causes the turbine trip, not the other way around <P-9. C is incorrect because the loss of power would cause rods to fall in, but there is a 2 second time delay before the F-33 could become active. D is correct because the voltage on the group busses will lower to the trip setpoint in a matter of cycles.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Overhead Annunciators Window F	S2.OP-AR.ZZ-0006			13

L.O. Number: ABLOP1E004

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 19

Which of the following describes the bases for why certain Air Operated Valves (AOV's) have redundant air supplies which automatically swap to the unaffected Control Air (CA) header on a loss of the Primary air supply?

a. Prevents the erratic operation of Feedwater Reg valves which occurs when control air supply pressure lowers to ~90psig.

b. Prevents exceeding a Safety Limit when the normal air supply to the PZR PORVs is isolated on a Phase A containment isolation signal.

c. Ensures that a ruptured SG secondary side can be fully isolated within the time required to prevent a release in excess of allowable limits.

d. Ensures that a loss of an individual CA header does not result in a loss of CA to instruments and/or air-operated devices required for an orderly and controlled shutdown.

Answer d **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 000065K304 AK3.04 **RO Value:** 3.0 **SRO Value:** 3.2 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Loss of Instrument Air 065

KA Statement: Knowledge of the reasons for the following responses as they apply to Loss of Instrument Air:
Cross-over to backup air supplies

Explanation of Answers: 55.41.b(7) C is incorrect because all the valves on the secondary side of a SG required to be shut to isolate a SG during a SGTR per SGTR-1 are fail closed on loss of air valves (MS7, MS10, MS18, GB4, and MS167 (because the MS169 and 171 fail open) Page 37 of AB shows MS fail closed, and SGTR sheet 1 Ruptured SG Isolation identifies valves required to be shut for isolation. B is incorrect because the PZR PORVs have a separate backup air supply system (Accumulator). However, the PORVs are not required for Safety Limit reasons, that function is performed by the 3 Code Safety Valves. (UFSAR 5.5.13) The PZR PORVs are designed to limit PZR pressure to a value below the high pressure reactor trip setpoint. A is incorrect because the Rx is required to be tripped when control air header pressure falls below 80 psig in part because the Feed reg valves operation does become erratic below that pressure.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Control Air	S2.OP-AB.CA-0001	Proc/Bases Document	37/7	16
Salem UFSAR		Section 5.5.13		17
NOS05CONAIR-07	Control Air System		13	7

L.O. Number Objectives

ABCA01E001

Material Required for Examination

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

Question Source Comments

Comment

Other reference SGTR-1 Sheet 1

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 20

Given the following conditions:

- Unit 2 Control Room has been evacuated due to a Security Event.
- The TSC has identified 4 control rods did not insert on the Rx trip, and remain fully withdrawn.

Which of the following actions required to establish Rapid Boration is the ONLY action that can be PERFORMED by the Plant Operator at the Hot Shutdown Panel 213 IAW S2.OP-AB.CR-0001, Control Room Evacuation?

a. Start a Boric Acid pump in FAST speed.

b. Open the 2CV175, RAPID BORATE STOP VALVE.

c. Adjust charging flow to > 75 gpm above seal injection flow.

d. Shut the 21CV160 and 22CV160, BA XFR RECIRC CONTROL VLVS.

Answer a **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 000068K201 AK2.01 **RO Value:** 3.9 **SRO Value:** 4.0 **Section:** EPE **RO Group:** 2 **SRO Group:** 2 55.43

System/Evolution Title: Control Room Evacuation 068

KA Statement: Knowledge of the interrelations between Control Room Evacuation and the following:
Auxiliary shutdown panel layout

Explanation of Answers: 55.41.b(10,7) All of the choices are actions that are performed to establish Rapid Boration when required. The only action that can be performed from the Hot Shutdown Panel is operation of the Boric acid pump. The CV175 is locally manually opened. The CV55 is adjusted locally by adjusting air supply to 2CV55 at panel 216-2.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Hot Shutdown Station Panel 213	219456			30
Control Room Evacuation	S2.OP-AB.CR-0001		27-33	22

L.O. Number

ABCR01E001

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 21

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 FIRST show a change because of the failed fuel?

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** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

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 Monitoring System Operation	S2.OP-SO.RM-0001			35
Chemical and Volume Control	205328	Sheets 1 and 2		71,81

L.O. Number Objectives

ABRC02E001

RMS000E007

RMS000E014

Material Required for Examination

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

Question Source Comments Vision Q85077, modified stem to state position of CV18 shut to ensure letdown has to be O/S.

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 22

Given the following conditions:

- Unit 2 is operating at 55% power, 600 MWe.
- Operators are currently in S2.OP-AB.GRID-0001, Abnormal Grid, due to grid instabilities.
- Main Generator MVARS OUT are at the maximum allowable per A-5-500-EEE-1686, Artificial Island Operating Guide and Documentation, per Load Dispatcher request due to 500KV grid problems.
- Main Generator voltage regulator is in AUTO.

The control room receives OHA H-13, GEN FLD OVRVOLT.

If the alarm does not clear within 10 seconds, which of the following identifies what will occur FIRST as a DIRECT result of this condition with NO operator action?

a. Main Turbine will trip.

b. Exciter Field Breaker will open.

c. Main Turbine runback will occur.

d. Main Generator output breakers will open

Answer a **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 000077K102 AK1.02 **RO Value:** 3.3 **SRO Value:** 3.4 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

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

KA Statement: Knowledge of the operational implications of the following concepts as they apply to Generator Voltage and Electric Grid Disturbances:

Over-excitation

Explanation of Answers: 55.41.b(10) The ARP for OHA states that the alarm annunciates at 105% of rated field voltage. The J1K relay attempts to lower voltage to the 100% value, and after 5 seconds if voltage is not reduced to < 105% it swaps the regulator to manual. If after 10 seconds the voltage is still >105%, with the Main Generator output breakers shut, it will trip the Main Turbine, which in turn will trip the Main Generator output breakers 30 seconds later. D is incorrect because the main gen output breakers are NOT affected as a DIRECT result of the overvoltage condition, but as an ancillary action that occurs when the Main Turbine trips. C is incorrect because there is no runback associated with this condition. B is incorrect because the Exciter Field Breaker will only trip directly if NO Main Generator output breakers are shut.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Abnormal Grid	S2.OP-AB.GRID-0001			16
Overhead Annunciators Window H	S2.OP-AR.ZZ-0008		20-21	18

L.O. Number

ABGRIDE001

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 23

Given the following Unit 2 conditions:

- A manual safety injection was initiated when RCS leakage exceeded charging capability.
- The crew has progressed through the EOP's and is now in TRIP-3, Safety Injection Termination.
- 21 Charging Pump is running.
- Both SI Pumps and both RHR Pumps were just stopped.

Which of the following parameters will be evaluated at the SI Reinitiation Criteria step to determine the need for reinitiating ECCS flow ?

a. CET trend and PZR level.

b. CET trend and RCS pressure.

c. RCS subcooling and PZR level.

d. RCS subcooling and SG Pressure.

Answer c **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 00WE02K102 EK1.2 **RO Value:** 3.4 **SRO Value:** 3.9 **Section:** EPE **RO Group:** 2 **SRO Group:** 2 55.43

System/Evolution Title: SI Termination E02

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

Explanation of Answers: 55.41.b(10) Step 10 asks for RCS subcooling > 0, which is obtained from the Subcooling Margin Monitor (SMM) on RP4. It also asks for PZR level >11%. A is incorrect because CET's are not checked, but PZR level is. B is incorrect because while this combination is what gives operators their input into the SMM, there is no trend involved. C is correct. D is incorrect because while SG pressure will be correlated to RCS loop Tc, it is not checked.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Safety injection Termination	2-EOP-TRIP-3	Flowchart and Bases D	25-26	25

L.O. Number
TRP003E005
TRP003E003

Objectives

Material Required for Examination

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

Question Source Comments Vision Q78103 modified by replacing distracter D in bank to new B distracter above.

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 24

Given the following cond tions:

- Unit 2 is operating at 25% power during a power ascension following a refueling outage.
- 21 charging pump is in service.
- A RCS leak is identified, and operators enter S2.OP-AB.RC-0001, Reactor Coolant System Leak.
- After reducing letdown flow to minimum, and raising charging flow to maximum, the following indications are present:
  - PZR level is 27% and lowering 0.1% every 45 seconds.
  - 22 RHR sump pump run alarm is locked in.

Which of the following describes the proper course of action for these conditions, and why?

a. Trip the Main Turbine and enter S2.OP-AB.TRB-0001, Turbine Trip Below P-9. Safety Injection will only be required if VCT level can NOT be maintained above 4%.

b. Trip the Rx and initiate Safety Injection. The leak rate exceeds the CVCS system make-up capacity. Action will be taken in LOCA-6, LOCA Outside Containment to isolate the leak from the RHR system.

c. Isolate letdown to establish rising PZR level and place the CVCS Make-Up system in manual to raise VCT level. This will ensure PZR level can be maintained above 11% and preclude having to initiate Safety Injection.

d. Place a second centrifugal charging pump in service. Continue in AB.RC-0001 to perform leak identification and isolation steps. Initiate a unit shutdown to comply with the actions of TSAS 3.4.7.2 Reactor Coolant System Operational Leakage.

Answer b | **Exam Level** R | **Cognitive Level** Comprehension | **Facility:** Salem 1 & 2 | **ExamDate:** 5/17/2010

KA: 00WE04K102 | EK1.2 | **RO Value:** 3.5 | **SRO Value:** 4.2 | **Section:** EPE | **RO Group:** 1 | **SRO Group:** 1 | 55.43

System/Evolution Title: LOCA Outside Containment | E04

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

Explanation of Answers: 55.41.b(10) "I" NRC RO Exam
RCS leakage in excess of the capacity of one charging pump will require a Rx trip and SI. A is incorrect because tripping the turbine is not indicated since a rx trip and SI is required. C is incorrect because isolating letdown will cause a more rapid depletion of VCT level. D is incorrect because if the leak is so large that a second charging pump is required, it indicates the need for safety injection, and continuing to attempt a unit shutdown is incorrect.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Reactor Coolant System Leak	S2.OP-AB.RC-0001			10
LOCA Outside containment	2-EOP-LOCA-6			21

L.O. Number
ABRC01E004
LOCA06E007

Objectives

Material Required for Examination

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

Question Source Comments Salem 12/2006 NRC RO Exam

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 25

Given the following conditions:

- Unit 2 is operating at 100% power.
- 22 charging pump is C/T.
- A technician working in the control room rack area inadvertently causes a momentary P-14 signal to be actuated.
- Shortly after the Rx trip, 23 SG Safety Valve 23MS15 lifted and remains open.
- An automatic Safety Injection occurs on Main Steamline D/P.
- 2A 4KV vital bus is locked out on bus differential.
- NO AFW flow can be established, and operators transition to 2-EOP-FRHS-1, Response to Loss of Secondary Heat Sink.

Which of the following identifies how these conditions will be mitigated in 2-EOP-FRHS-1?

a. Operators will initiate Bleed and Feed because no charging pumps are available.

b. Steam Generators will be fed with a SGFP since SI reset action will allow prompt recovery of a SGFP.

c. Steam Generators will be fed using the Condensate system because the Safety Injection signal isolated Service Water to the SGFPs.

d. Steam Generators will be fed using the Condensate system because the locked in P-14 signal is maintaining a trip signal to the SGFPs.

Answer c **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 00WE05K201 EK2.1 **RO Value:** 3.7 **SRO Value:** 3.9 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Loss of Secondary Heat Sink E05

KA Statement: Knowledge of the interrelations between Loss of Secondary Heat Sink and the following:
Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Explanation of Answers: 55.41.b.(10,4,7) A is incorrect because the remaining centrifugal charging pump required to be operating (21) to prevent the transition to Bleed and Feed from step 4 IS available, its power supply is from 2B 4KV vital bus. 23 charging pump (positive displ pump) is supplied from A vital bus. B is incorrect because step 12.1 asks if Safety Injection has been initiated, and if yes, bypasses the SGFP recovery action and goes straight to condensate system recovery. C is correct and D is incorrect because the SGFPs are unavailable due to the SI signal which caused the SECs to close the SW to turbine building isolation valves, not the trip signal from P-14. P-14 is not a "lock in" relay, and the stem states a momentary signal is the cause of the P-14 actuation, which tripped the SGFPs and Main Turbine and isolated FW.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Response to Loss of Secondary Heat Sink	2-EOP-FRHS-1			24
2 Unit 4160V One Line	203061			33

L.O. Number
FRHS00E006

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 26

When preparing to depressurize SGs to ATMOSPHERIC pressure in 2-EOP-FRCC-2, "Response To Degraded Core Cooling", how should the RCPs be operated, and why?

a. ALL RCPs should be stopped because the drop in the #1 seal D/P during depressurization may result in pump damage.

b. All but one RCP should be stopped because loss of forced circulation flow would require more time to reach equilibrium conditions.

c. ALL RCPs should be stopped to avoid mechanical damage that can occur due to cavitation when the RCS reaches saturation conditions.

d. All but one RCP should be stopped because stagnating flow during depressurization could cause a bubble to form in the reactor vessel head.

Answer a **Exam Level** R **Cognitive Level** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 00WE06K102 EK1.2 **RO Value:** 3.5 **SRO Value:** 4.1 **Section:** EPE **RO Group:** 2 **SRO Group:** 2 55.43

System/Evolution Title: Degraded Core Cooling E06

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

Explanation of Answers: 55.41.b(10,3) A is correct because the Basis Document on page 35 states that the reason the RCPs are stopped is due to the anticipated loss of Number 1 seal requirement. Continued operation may result in damage to the RCPs. B is incorrect because while it will take longer on natural circ when RCPs are stopped, it's not the reason why, and one RCP is not left running. C is incorrect because cavitation should not be expected, since the procedure will be cooling down the RCS to <375 Thot. D is incorrect because 1 RCP will not be left running.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Response to Degraded Core Cooling	2-EOP-FRCC-2			21

L.O. Number Objectives

FRCC00E006

Material Required for Examination

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

Question Source Comments Vision Q57523, modified stem to remove window dressing, modified format of answers.

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

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.
- A PURPLE path on the Containment Environment Status Tree has just occurred when containment pressure reached 15 psig.

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. 2-EOP-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. 2-EOP-LOCA-5 since FRPs are NOT implemented during the performance of LOCA-5.

Answer b **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 00WE11G405 2.4.5 **RO Value:** 3.7 **SRO Value:** 4.3 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Loss of Emergency Coolant Recirculation E11

KA Statement:

Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions.

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. Knowledge of the implementation requirements for RED and PURPLE path status trees is required, since LOCA-5 does NOT suspend performance of the FRPs as do some of the other EOPs. Knowledge that both a FRP and EOP can be performed AT THE SAME TIME is required.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Emergency Recirculation	2-EOP-LOCA-5			25
Response to Excessive Containment Pressure	2-EOP-FRCE-1			22

L.O. Number
LOCA05E009
FRCE00E006

Objectives

Material Required for Examination					
Question Source:	Facility Exam Bank	**Question Modification Method:**	Editorially Modified	**Used During Training Program**	☐
Question Source Comments	Vision Q48927				

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 28

Given the following conditions:

- Unit 1 is operating at 100% power.
- 1E 460 volt bus is deenergized following a trip of its feed breaker.
- Tagging is in progress to allow troubleshooting of 1E 460 volt bus.

The operator mistakenly opens the 1F 460 volt bus feed breaker, deenergizing the 1F 460 volt bus.

Which of the following describes a consequence, if any, of this action?

Unit 1 Reactor...

a. will trip due to the loss of BOTH Rod Drive Motor Generators.

b. will trip due to the loss of a SINGLE Rod Drive Motor Generator.

c. will NOT trip because BOTH Rod Drive Motor Generators are still in service.

d. will NOT trip because ONE Rod Drive Motor Generator is sufficient to maintain power to the Rod Control system.

Answer d **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 001000K201 K2.01 **RO Value:** 3.5 **SRO Value:** 3.6 **Section:** SYS **RO Group:** 2 **SRO Group:** 2 55.43

System/Evolution Title: Control Rod Drive System 001

KA Statement: Knowledge of bus power supplies to the following:
One-line diagram of power supply to M/G sets.

Explanation of Answers: 55.41.b(7,6) 11 and 12 Rod Drive Motor Generators are powered from 1E and 1G 460 volt busses. A single RDMG set is sufficient to power Rod Control. Since the unit is still at 100% power subsequent to the loss of the 11RDMG , the loss of 1F 460 volt bus will not trip both Rod Drive MG sets. A is incorrect because 1F 460 bus does NOT power 11 RDMG set. B is incorrect because a single RDMG set can power Rod Control. C is incorrect because only 1 RDMG set is still in service. D is correct because 1 RDMG set will power rod control. The K/A is met because the knowledge of how the RDMG sets are powered requires knowledge of the one-line drawing of the power supplies.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
1E 460V Bus One-Line	601234			15
1F 460V Bus One-Line	601236			14
S1.OP-SO.RCS-0001	Rod Control System Operation			29

L.O. Number
RODS00E003

Objectives

Material Required for Examination

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

Question Source Comments Vision Q75013

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 29

Which of the following indications would be INEFFECTIVE in corroborating that a 20 gpm RCS leak in Unit 2 containment is occurring?

a. CFCU leak detection on 2CC1 trending up.

b. Containment recirc sump level on 2CC1 is rising.

c. Containment dew point reading on 2RP1 is rising.

d. 2R11A, Containment Particulate radiation monitor reading on 2RP1 is rising.

Answer b **Exam Level** R **Cognitive Level** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 002000K303 K3.03 **RO Value:** 4.2 **SRO Value:** 4.6 **Section:** SYS **RO Group:** 2 **SRO Group:** 2 55.43

System/Evolution Title: Reactor Coolant System 002

KA Statement: Knowledge of the effect that a loss or malfunction of the Reactor Coolant System will have on the following: Containment

Explanation of Answers: 55.41.b(9) A is incorrect because CFCU leak detection will rise as the moisture in containment is removed from the air by CFCUs. B is correct because the containment recirc sump level is used to determine if sufficient level is in containment following a LBLOCA to allow operation on Cold Leg Recirc. There is a smaller containment pocket sump, but it does not have an indication on 2CC2, and is not called the "recirc" sump. C is incorrect because containment dew point readings on chart recorder on 2RP1 will rise due to higher moisture content in containment. D is incorrect because containment particulate is expected to rise.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Identifying and Measuring Leakage	S2.OP-SO.RC-0004		25	14
Equipment Vents and drains -Contaminated	205327-3			24

L.O. Number

RCS000E014

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 30

Which of the following describes how the Reactor Coolant Pump Lower Radial Bearing and Reactor Coolant Pump Seals are cooled when the NORMAL CVCS seal injection flow is lost?

a. Back-up seal cooling flow is provided to ALL RCPs by opening the CV114, Seal Leakoff Bypass valve.

b. Back-up seal cooling flow is provided to individual RCPs by opening the CV75 PZR Auxiliary Spray Isolation valve and closing the respective CV104, RCP Seal Leakoff Valve.

c. Reactor coolant flows up the RCP shaft through the Thermal Barrier where it is cooled by the CCW in the Thermal Barrier Heat Exchanger, and then flow continues along the shaft to the radial bearing and RCP Seal package

d. Reactor coolant flows up through the radial bearing and into the Thermal Barrier, where the heat from the RCS and the bearing are dissipated by CCW flow through the Thermal Barrier. This cool water then flows through the #1 seal.

Answer: c | **Exam Level:** R | **Cognitive Level:** Memory | **Facility:** Salem 1 & 2 | **ExamDate:** 5/17/2010

KA: 003000K404 | K4.04 | **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 Reactor Coolant Pump System design feature(s) and or interlock(s) which provide for the following:
Adequate cooling of RCP motor and seals

Explanation of Answers: 55.41.b.3) B is incorrect (but plausible) because Prereq 2.3.2 of SO.RC-0001, RCP Operation, has Aux Spray put in operation for maintaining PZR level while preparing to start RCP. A is incorrect because CV114 is only opened at low RCS pressure when seal leakoff lowers due to low D/P. D is incorrect because hot RCS is cooled first by Thermal barrier before reaching Radial bearing and seals.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
RCP Lesson Plan	NOS05RCPUMP-09			

L.O. Number
RCPUMPE004

Objectives

Material Required for Examination:

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

Question Source Comments: Vision Q58727 Replaced 3 distracters with more plausible ones.

Comment:

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 31

Given the following conditions:

- Unit 2 is operating at ˊ2% power.
- 24 RCP trips.

With NO operator action, which of the following describes how indicated loop flow and loop D/T in RCS loops 21-23 will be affected?

Loop flow will _____, and loop D/T will _____.

a. rise, rise.

b. rise, lower.

c. lower, rise.

d. lower, lower.

Answer a **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 003000K505 K5.05 **RO Value:** 2.8* **SRO Value:** 3.0* **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Reactor Coolant Pump System 003

KA Statement: Knowledge of the operational implications of the following concepts as they apply to the Reactor Coolant Pump System: The dependency of RCS flow rates upon the number of operating RCPs

Explanation of Answers: 55.41.b(2,3) When 24 RCP trips, loop flow in that loop will lower to zero and then reverse. Reverse flow in an idle loop with the remaining 3 RCPs in service at low power is ~32%. Loop flow in the lops with the RCPs still running will rise to compensate for this reverse flow. Additionally, with no change in steam demand, the D/T in the remaining 3 loops will rise since the same amount of power must be made with only 3 loops providing power. With the reactor between 10-36% power, the trip of a single RCP will not automatically trip the Rx.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Reactor Coolant Pump Operation	S2.OP-SO.RC-0001			29

L.O. Number

RCPUMPE016

Objectives

Material Required for Examination

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

Question Source Comments Vision Q28924 concept used

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 32

Given the following conditions:

- Unit 2 is at 100% power.
- Core Burnup is 8,000 EFPH.
- Rod Control is in MANUAL.
- Main Turbine Governor Valves are FULLY open.
- A normal AUTO makeup initiates to the VCT.
- The boron addition rate is set 5 gpm higher than required for present RCS conditions.

Assuming NO operator action, what will be the effect on Rx power and RCS Tave 15 minutes after the auto makeup is complete?

Reactor Power will be _____, and RCS Tave will be _____.

a. lower, lower.

b. lower, higher.

c. higher, lower.

d. higher, higher.

Answer a **Exam Level** R **Cognitive Level** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 004000A110 A1.10 **RO Value:** 3.7 **SRO Value:** 3.9 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Chemical and Volume Control System 004

KA Statement: Ability to predict and/or monitor changes in parameters associated with operating the Chemical and Volume Control System controls including:
Reactor power

Explanation of Answers: By having the boron addition rate set 5 gpm higher, the boron addition will add negative reactivity to the core as it is pumped into the RCS from the VCT. AUTO makeup to the VCT starts at 14% and stops at 24% level. The VCT contains approximately 20 gallons per percent, so 200 gallons should be pumped into the RCS in 5 minutes. This allows 10 minutes for the effect of the boron addition to be seen on the control boards. The negative reactivity will cause Reactor power to lower, and RCS temperature will lower and add positive reactivity. With the lower temperature, S/G pressure will lower. If the Main Turbine governor valves were NOT full open, and the MT operating in TIP control mode, the governor valves would open to maintain inlet pressure. However, since they are full open and can't open more, steam pressure will lower and remain lower. Rod control is in MANUAL, which would prevent outward rod motion if the operator were to assume that rods weren't ARO.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Boron Concentration Control	S2.OP-SO.CVC-0006			21

L.O. Number
CVCS00E015

Objectives

Material Required for Examination					
Question Source:	Facility Exam Bank	**Question Modification Method:**	Significantly Modified	**Used During Training Program**	☐
Question Source Comments	Vision Q78012 Modified stem to include governor valves full open, which changes correct answer. Removed part of answer for Main generator electrical output status.				

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 33

Which of the following identifies the vital 4KV power supplies to the 11 and 12 RHR pumps, respectively?

a. A bus; B bus.

b. A bus; C bus.

c. B Bus; C Bus.

d. B bus; A bus.

Answer a **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 005000K201 K2.01 **RO Value:** 3.0 **SRO Value:** 3.2 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Residual Heat Removal System 005

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

Explanation of Answers: 55.41.b(8) 11 and 12 RHR pumps are powered from "A" and "B" 4KV vital busses respectively. Other ECCS pumps, (11 and 12 SI, and 11 and 12 CS) are powered from A and C. Unit 2 SW pumps are powered in reverse order, 21/22 from C, and 25/26 from A, when considering plausible distracters. Charging pumps 21 and 22 are powered from B and C busses, again when considering plausible distracters.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
No. 1 Unit 4160V Vital Busses One Line	203002			34

L.O. Number
RHR000E005

Objectives

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Concept Used **Used During Training Program**

Question Source Comments Fermi 7/7/03 NRC Exam

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 34

Given the following conditions:

- Unit 2 was operating at 100% power when a LOCA occurred.
- RCS pressure is currently 500 psig and stable.
- Containment pressure is 9 psig and rising slowly.
- RWST level is 23' and lowering.

Which of the following is the CLOSEST to the total amount of ECCS injection flow?

a. 16,700 gpm.

b. 11,470 gpm.

c. 7,670 gpm.

d. 2,500 gpm.

Answer d **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

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(8) 2,500 is correct, because runout flow for each of 2 charging pumps is 560 gpm at 550 psid, and runout flow for each of the 2 SI pumps is 675 gpm @675 psid. Operating at runout flow would yield a maximum flow of 2470. 7670 is if containment spray flow (5200) was added to SI and CVCS flow, but no CS flow would be expected at 9 psig in containment, and is not considered ECCS injection flow. 11,470 is if the 2 RHR pumps runout flow is added (4,500 @ 130 psid x 2 = 9000 gpm+ 2470 gpm) 16,700 is if an additional 5,200 gpm from containment spray flow is added.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem UFSAR		6	6.3-7	20
Emergency Core Cooling Lesson Plan	NOS05ECCS00-06		23, 25-26	6
Containment Spray Lesson Plan	NOS05CSPRAY-03		17-18	3

L.O. Number
ECCS00E008

Objectives

Material Required for Examination

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

Question Source Comments Vision Q49963 for time required for injection of RWST contents.

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 35

Using the below list, which of the following choices contains ONLY the interlocks which must be met to open 12SJ45 RHR TO CHG SI PMPS STOP MOV?

I. Both 1RH1 and 1RH2 RHR COMMON SUCT MOV must be shut.
II. Either 1RH1 or 1RH2 RHR COMMON SUCT MOV must be shut.
III. Both 11SJ44 and 12SJ44 CONT SUMP SUCT VALVE MOV must be open.
IV. Either 11SJ44 or 12SJ44 CONT SUMP SUCT VALVE MOV must be open.
V. 12SJ44 CONT SUMP SUCT VALVE MOV must be open.
VI. Both 1SJ67 and 1SJ68 SJ PUMP MIN FLOW VALVE must be shut.
VII. Either 1SJ67 or 1SJ68 SJ PUMP MIN FLOW VALVE must be shut.

a. I, III, VII.

b. II, V, VI.

c. II, V, VII.

d. I, IV, VI.

Answer c **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 006000K416 K4.16 **RO Value:** 3.2 **SRO Value:** 3.5 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Emergency Core Cooling System 006

KA Statement: Knowledge of Emergency Core Cooling System design feature(s) and or interlock(s) which provide for the following:
Interlocks between RHR valves and RCS

Explanation of Answers: 55.41.b(8, 10) Using Logic Diagram 224421, it shows that to open 12SJ45 you must have: 1. Either 1SJ67 or 1SJ68 shut (VII); 2. Either 1RH1 or 1RH2 shut (II); 3. 12SJ44 open (V). The distracters all contain at least one of the choices which is not included in this list.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
CVC System No. 12SJ45 Chg Suct	224421			3

L.O. Number
ECCS00E006

Objectives

Material Required for Examination

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

Question Source Comments Vision Q80573

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 36

Given the following conditions:

- Unit 2 was operating at 100% reactor power when a Reactor Trip and Safety Injection were initiated due to lowering Pressurizer pressure.
- Five minutes after the SI actuation, containment humidity and pressure have just begun rising.

Assuming NO operator actions were taken, which of the following would result in these conditions?

a. RCP #1 Seal failure.

b. Pressurizer Safety Valve failed open.

c. Steam Generator Blowdown piping failure.

d. Incore Thimble Tube failure at Reactor Vessel Penetration.

Answer b **Exam Level** R **Cognitive Level** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 007000K301 K3.01 **RO Value:** 3.3 **SRO Value:** 3.6 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

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

KA Statement: Knowledge of the effect that a loss or malfunction of the Pressurizer Relief Tank/Quench Tank System will have on the following: Containment

Explanation of Answers: The failure of a RCP #1 seal will not be seen in containment outside of closed systems. The excess seal leakoff flow past the #2 seal will be seen as a rise in RCDT level. The PZR safety failing open will cause the PRT to pressurize and the rupture disk to rupture, causing the saturated steam in the PRT to continuously be vented to containment. The SGBD piping failure would not cause a rise in radiation levels. The flux thimble is a relatively small line, and radiation levels would rise from the start of the event, but sump level would take a verrrry long time to rise.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
No. 2 Unit Reactor Coolant	205301-1			58

L.O. Number Objectives

PZRPRTE008

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Editorially Modified **Used During Training Program**

Question Source Comments Point Beach 1/20/2006 NRC exam, modified PORV failure to Safety failure for realism. Remove PRT pressure and temp ind in stem to raise level of difficulty. Removed cont sump pump start because it would not happen immediately

Comment

Question Topic RO 37

Given the following conditions:

- Unit 2 is operating at 100% power.
- Operators receive OHA A-6, RMS HI RAD OR TRBL, and determine the 2R17A and 2R17B, Component Cooling Header 21 and 22 Rad Monitors are both in alarm.
- CC Surge Tank level is determined to be rising very slowly.

Which of the following describes the impact of the radiation alarms, and what action(s) will the control room crew be directed to perform IAW S2.OP-AB.CC-0001, Component Cooling Abnormality?

a. 2CC149, CC Surge Tank Vent valve automatically shuts to prevent contaminating the in-service WHUT. Drain the CC Surge tank to maintain level < 58%.

b. 2CC149, CC Surge Tank Vent valve automatically shuts to prevent contaminating 22 Aux Building Exhaust Filter Unit. Ensure Surge Tank Makeup valve is shut.

c. 2CC131, RCP Thermal Barrier Isolation valve automatically shuts to prevent a RCP Thermal Barrier leak from contaminating the CCW system. Shift the Aux Building ventilation Normal Areas exhaust to 22 HEPA PLUS CHARCOAL.

d. 2CC131, RCP Thermal Barrier Isolation valve automatically shuts to prevent a RCP Thermal Barrier leak from contaminating the CCW system. Shift the Aux Building ventilation Emergency Areas exhaust to 22 HEPA PLUS CHARCOAL.

Answer b **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 008000A204 A2.04 **RO Value:** 3.3 **SRO Value:** 3.5 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Component Cooling Water System 008

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

Explanation of Answers: A is incorrect because draining the Surge tank is NOT appropriate here, because the procedure directs it to be drained to a 55 gallon drum. The Basis Document page 3 specifically states, "The CCW Surge tank is drained to maintain level <58% for cases where 2R17A/B are NOT in warning or alarm (Step 3.10) ". B is correct because the CC149 vent valve and the CC147 tank relief valve combine into a common header which goes both to the ABV ventilation system and the Contaminated Floor Drains system. With Surge Tank level rising, any potential source of inleakage is isolated, regardless of whether a high rad condition exists. The CC surge tank M/U is isolated at step 3.4, just prior to checking R17A/B status at step 3.5. C and D are incorrect because while high CC return flow from the RCP thermal barriers will isolate the CC131, it would result in a rapid rise in CC surge tank level. Additionally, the ABV filter would not be selected since the source of the radiation in the CC surge tank has been isolated by the automatic closure of the CC149.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Component Cooling Abnormality	S2.OP-AB.CC-0001		2-8	13
Abnormal Radiation	S2.OP-AB.RAD-0001		6	27

L.O. Number 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 38

Given the following conditions:

- Unit 2 is operating at 100% power.
- Both PZR spray valves have been placed in manual control to investigate erratic responses.
- PZR Pressure Channel IV has failed low. NO action has been taken to place it in the tripped condition yet.
- PZR Master Pressure Controller is selected to Channel I for control.
- PZR Backup heaters are in Auto and OFF.
- A main turbine control failure results in a rapid load reduction.
- RCS temperature, PZR level, and PZR pressure rise rapidly.
- As RCS pressure rises past 2335 psig, the NCO observes that PZR level is 68%, 2PR1 is open, 2PR2 is closed, and PZR backup heaters are energized.

Which of the following describes how the PZR pressure control system is responding?

a. Malfunctioning, the PZR backup heaters should be deenergized.

b. Operating as expected for given conditions.

c. Malfunctioning, 2PR1 should be closed.

d. Malfunctioning, 2PR2 should be open.

Answer b **Exam Level** R **Cognitive Level** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 010000K103 K1.03 **RO Value:** 3.6 **SRO Value:** 3.7 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Pressurizer Pressure Control System 010

KA Statement: Knowledge of the physical connections and/or cause-effect relationships between Pressurizer Pressure Control System and the following:
RCS

Explanation of Answers: 55.41.b(7) With PZR pressure channel IV failed LOW, and the bistables NOT tripped per stem conditions, 2PR2 is inoperable and will NOT automatically open on high PZR pressure of 2335 psig since it needs 2/2 channels (PZR pressure channels II & IV) to open. The PZR heaters are ON since actual PZR level is 5% > clipped program level of ~59%. (PZR programmed level cannot be >60%, and the PZR B/U heaters energize when actual PZR level is 5% above programmed level.) Normally, PZR B/U heaters would be deenergized with PZR pressure > 2218 psig. The pressure channel bistables are tripped when removing the channel from service, which has not been done as per stem conditions.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Pressurizer Pressure Malfunction	S2.OP-AB.PZR-0001		22	18
Overhead Annunciators Window E	S2.OP-AR.ZZ-0005		29-30	18

L.O. Number
PZRP&LE004

Objectives

Material Required for Examination	

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

Question Source Comments	Vision Q67201 Added B/U heater status and PZR Master Pressure Controller Control channel to stem

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 39

Which of the following would cause a loss of position indication for 1PR2, PZR PORV, on 1CC2?

a. Loss of 115 Volt AC bistable power to PC-403.

b. Loss of 115 Volt AC bistable power to PC-405.

c. Loss of 28 Volt DC control power to 1PR2 control circuitry.

d. Loss of 230 Volt AC motive power to 1PR2 valve operator.

Answer	c	Exam Level	R	Cognitive Level	Memory	Facility:	Salem 1 & 2	ExamDate:	5/17/2010

KA:	010000K203	K2.03	RO Value:	2.8*	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 bus power supplies to the following:
Indicator for PORV position

Explanation of Answers: 55.41.b(7) A and B are incorrect because bistable power would affect 1RP4 indication if not present, not a loss of console indication. D is incorrect because the PORV is an air operated valve. The PORV Block valve is powered from 230 VAC. C is correct because the console OPEN / CLOSE PBs receive their power from 28VDC as does all the control PBs on the control consoles. A and B are plausible because of the relationship between the PORV operation circuitry and which pressure controller operates them (reverse of logical order)

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
No. 1 Unit PZR Power Relief and Stop Valves	242881			7
No. 1 Unit PZR Power Relief and Stop Valves	242882			15

L.O. Number

PZRP&LE008

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 40

Given the following conditions:

- Unit 1 is operating at 100% power.
- PZR level Channel I (one) is selected for CONTROL.
- PZR level Channel II (two) is selected for ALARM.
- PZR level Channel II (two) fails LOW.

Which of the following describes the effect that this will have on PZR level control, and the action(s), if any, that will be performed IAW S1.OP-AB.CVC-0001, Charging System Malfunction?

a. OHA E-36, PZR HTR OFF LVL LO will annunciate, but charging and letdown flow will remain constant since it is the alarm channel and actual PZR level is on program.

b. 1CV2, LETDOWN LINE ISOL and 1CV277, LETDOWN LINE ISOL will shut. Channel I (one) must be selected for Alarm to clear the interlock and allow opening of the 1CV2 and 1CV277.

c. PZR level will rise. Charging System Master Flow Controller must be placed in manual. Charging flow will be raised to 85-90 gpm prior to operating the 1CV3, 1CV4, or 1CV5 LETDOWN ORIFICE ISOL valves.

d. PZR level will lower. Charging System Master Flow Controller must be placed in manual. Charging flow will be lowered to 85-90 gpm prior to operating the 1CV3, 1CV4, or 1CV5 LETDOWN ORIFICE ISOL valves.

Answer c **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 011000A211 A2.11 **RO Value:** 3.4 **SRO Value:** 3.6 **Section:** SYS **RO Group:** 2 **SRO Group:** 2 55.43

System/Evolution Title: Pressurizer Level Control System 011

KA Statement: Ability to (a) predict the impacts of the following on the Pressurizer Level Control System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation:
Failure of PZR level instrument - low

Explanation of Answers: 55.41.b(7,10) D is incorrect because PZR level will rise due to the loss of letdown and the continued charging flow. A is incorrect because while the OHA will annunciate, either of the Control OR alarm channel will shut the orifice isolation valves CV3,4,5, along with their respective CV2 or 277. B is incorrect because only 1CV277 will shut on an Alarm channel failure, not 1CV2 also. Additionally, the unaffected available channel (III) will be selected for alarm, not channel I. C is correct because PZR level will rise since letdown flow has stopped, and charging flow continues. At step 3.58.F, charging flow is raised to 85-90 gpm in anticipation of opening the orifice isolation valve CV3,4,or 5

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Charging	S1.OP-AB.CVC-0001			7
Overhead Annunciator Window E	S1.OP-AR.ZZ-0005			16

L.O. Number
PZRP&LE015

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 41

Given the following conditions:

- Unit 2 is operating at 100%.
- Containment Pressure Channel I (one) failed high and was removed from service IAW S2.OP-SO.RPS-0005, Placing Containment Pressure Channel in Tripped Condition.
- A technician troubleshooting the failed channel inadvertently de-energizes the power for Containment Pressure Channel III (three).
- The Rx does NOT trip.

Which of the following identifies what has happened, and what actions, if any, that must be taken?

a. NO Rx trip or containment isolation signals are expected for this condition. Enter Tech Spec 3.0.3.

b. An ATWT has occurred since the Rx should have tripped from the SI signal generated when 2/3 coincidence for High Containment Pressure was met. Trip the Rx and go to EOP-TRIP-1, Rx Trip or Safety Injection.

c. A Containment Phase B isolation signal has been generated, and the Rx is NOT expected to have tripped. If the Phase B signal can NOT be reset within 5 minutes, trip the Rx and go to EOP-TRIP-1 Rx Trip or Safety Injection.

d. An ATWT has occurred since the Rx should have tripped on the Containment Spray initiation signal generated when 2/4 coincidence for Hi-Hi Containment pressure was met. Trip the Rx and go to EOP-TRIP-1, Rx Trip or Safety Injection.

Answer	a	**Exam Level**	R	**Cognitive Level**	Comprehension	**Facility:**	Salem 1 & 2	**ExamDate:**	5/17/2010

KA:	012000A203	A2.03	**RO Value:**	3.4	**SRO Value:**	3.7	**Section:**	SYS	**RO Group:**	1	**SRO Group:**	1	55.43	

System/Evolution Title: Reactor Protection System | 012

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

Incorrect channel bypassing

Explanation of Answers: 55.41.b(7) Containment pressure channel I is dedicated to Containment Hi-Hi pressure and Containment Spray/MSLI, and does not feed into the Safety Injection coincidence of 2/3. The stem states that the technician deenergizes the power to channel III, which would prevent energizing its associated bistable, so an automatic SI will not occur. The containment hi-hi bistables are energized to actuate, and are not tripped during channel removal. Since there is no SI or Phase B signal, no actuations will occur. The loss of a second channel of containment pressure will cause Tech Spec 3.0.3 to be entered, because there is only an action for 1 of 4 cont pressure channels being O/S under ESFAS Tech Spec 3.3.2.1

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Placing Containment Pressure Channel in Tripp	S2.OP-SO.RPS-0005			2
Salem Tech Specs	Section 3.3.2.1			266
	221057			22

L.O. Number

RXPROTE012

Objectives

Material Required for Examination

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

Question Source Comments Vision 57760 used, but added Rx trip status, whether it should have tripped, and what to do next.

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 42

Given the following conditions:

- Unit 2 is at 75% power.
- Console alarm "LOSS OF TRIPPING CAPABILITY" Alarm is received for "A" Reactor Trip Breaker (RTB).

Which of the following describes the effect on RTB "A" from this condition?

a. A Manual Rx Trip signal will ONLY energize RTB "A" UV trip coil.

b. Depressing the RTB "A" OPEN pushbutton on 2CC2 will cause a Rx trip.

c. An Automatic Rx trip signal will ONLY energize the RTB "A" Shunt trip coil.

d. A Manual Safety Injection initiation will NOT directly cause RTB "A" breaker to open.

Answer d **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 012000K102 K1.02 **RO Value:** 3.4 **SRO Value:** 3.7 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Reactor Protection System 012

KA Statement: Knowledge of the physical connections and/or cause-effect relationships between Reactor Protection System and the following: 125V dc system

Explanation of Answers: 55.41.b(7) The loss of tripping capability alarm indicates that power to energize the shunt trip of the RTB is not present. The shunt trip is energized from ANY auto or manual trip, and ANY auto or manual SI. The UV coils, which are deenergize to actuate only get trip signals from ANY auto or manual rx trip, and any AUTO SI. Additionally, the OPEN PB on the control console ONLY energizes the shunt trip coil. For the above conditions......A is incorrect because a manual Rx trip will only DE-energize the UV coil. B is incorrect because the PB only energized shunt trip coil which has no power to energize. C is incorrect because there is no power to the shunt coil AND the UV coil would deenergize. D is correct because a manual safety injection signal ONLY acts to energize the shunt coil, which has no power. The word "directly" is part of the correct answer because the Rx will trip from the redundant train, and the RTB "A" WILL eventually trip when its UV coil is de-energized

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Reactor Protection System Rx trip signals	221051			13
Control Console 2CC2	S2.OP-AR.ZZ-0012		102	35

L.O. Number

RXPROTE007

Objectives

Material Required for Examination

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

Question Source Comments Vision Q77831 Kept stem conditions, changed to new correct answer. Changed 2 of 3 distracters.

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 43

Which ONE of the following completes the description of the ECCS design basis single failure criteria for the INJECTION phase of an accident?

The ECCS is designed to withstand any single __________ failure and still perform its intended safety function.

a. active ONLY.

b. passive ONLY.

c. active OR passive.

d. active AND passive.

Answer a **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 013000K502 K5.02 **RO Value:** 2.9 **SRO Value:** 3.3 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Engineered Safety Features Actuation System 013

KA Statement: Knowledge of the operational implications of the following concepts as they apply to the Engineered Safety Features Actuation System:
Safety system logic and reliability

Explanation of Answers: 55.41.b(7) UFSAR Section 6, Engineered Safety Functions, 6.1.1.4 states..." During the recirculation phase the ECCS is tolerant of one active or one passive failure, but not in addition to a single failure in the injection phase" Additionally, UFSAR Section 6.3.1 states..."The system is effective...and is tolerant of failures of any single component or instrument channel to respond actively in the system."

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem UFSAR		6.1, 6.3	6.1-7, 6.3	23, 6

L.O. Number
ESF000E010

Objectives

Material Required for Examination

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

Question Source Comments Vision Q84059

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 44

Given the following conditions:

- Unit 1 is operating at 4% power during a Rx startup.
- 11 SG Steam Flow Channel I (one) has failed, and been removed from service IAW S1.OP-SO.RPS-0004, Placing a Steam Generator Channel in Tripped Condition.

Which of the following describes the automatic action(s) which will occur, if any, if 14 SG Steam Flow Channel II (two) were to fail high with NO operator action?

a. The Rx will NOT trip.

b. A Safety Injection will actuate, causing a Rx trip.

c. The Rx will trip, but a Safety Injection will NOT initiate.

d. A Main Steamline Isolation will occur, and a Rx trip will occur on High PZR pressure following MSIV closure.

Answer a **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 013000K601 K6.01 **RO Value:** 2.7* **SRO Value:** 3.1* **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Engineered Safety Features Actuation System 013

KA Statement: Knowledge of the of the effect of a loss or malfunction on the following will have on the Engineered Safety Features Actuation System:
Sensors and detectors

Explanation of Answers: 55.41.b(7) There is no Hi Steam Flow Rx Trip. There is a High Steam Flow SI, but it requires both 1/2 high steam flows on 2/4 steam generator COINCIDENT with either lo steam generator pressure or lo-lo Tave. When a SG Steam Flow channel is removed from service, it only trips the High Steam Flow signal to SI. When the second SG gets it 1/2 high steam flow, there is still no coincidence with steam pressure or Tavg to initiate a SI. There will just be 2 SG's that have a Hi Stm Flow signal associated with them. Steam Generator water level control will not be affected because Digital Feedwater will remove the failed channel from the control circuitry.
The Main Steamline isolation signal is developed just as the SI signal is developed, which requires the lo steam pressure or lo-lo Tavg.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
RPS Steam Generator Trip Signals	221056			8
Licensed Operator Fluency List	NOS05FLUNCY-05		11,14,16	5

L.O. Number

ESF000E021

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 identifies how Power Range Nuclear Instrument indication on the control console would change from BOL to EOL with NO compensatory actions?

At 100% power at EOL, the Power Range NIs would indicate _____ than actual power in the core. This occurs because ______.

Reference provided.

a. LOWER. Over core life Axial Flux will shift lower in the core, and PRNIs are positioned to monitor the upper 2/3 region of the core.

b. HIGHER. Over core life fuel burnup produces a negative reactivity effect, so thermal flux must rise to operate at the same power level.

c. HIGHER. The location of the PRNIs makes them more sensitive to power produced in the upper 1/2 of the core, and power production shifts upward over core life.

d. LOWER. The power density per area of all control rods lowers over core life. This will be seen as a lower total power, as the lower flux intensity will cause less neutrons to reach the NIs.

Answer b **Exam Level** R **Cognitive Level** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 015000A106 A1.06 **RO Value:** 2.5* **SRO Value:** 2.9 **Section:** SYS **RO Group:** 2 **SRO Group:** 2 55.43

System/Evolution Title: Nuclear Instrumentation System 015

KA Statement: Ability to predict and/or monitor changes in parameters associated with operating the Nuclear Instrumentation System controls including:
Fuel burnup

Explanation of Answers: 55.41.b(1,2) Power Range NI currents are adjusted on a periodic basis over core life to reflect the changing power distribution in the core. Using S1.RE-RZ.ZZ-0011, Tables as a guide, 100% NI currents can be seen to rise over core life. If no compensatory action was taken then as currents went up, the corresponding power indication would also rise. After a refueling outage, burnable poisons are loaded in the areas of the core. Over time, these poisons burn out, causing the amount of neutrons seen by the PRNI's to rise. A is correct. B is incorrect because the PRNIs are located to monitor the upper and lower halves of the core the same.
B and C are incorrect because NIS indication will rise over core life, and because of the PRNI location for equal core monitoring. D is incorrect because the power density of all rods will not rise over core life. (Note: Over core life the thermal flux must increase due to the lowering of the macroscopic fission cross section, as well as the increase in control rod worth as boron concentration increases.)

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Tables	S1.RE-RA.ZZ-0011, Tables			277
General Physics Reactor Theory Instructor Guid			8-18	4

L.O. Number
EXCOREE009
EXCOREE001

Objectives

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

Comment
Use this Revision ONLY

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 46

Which of the following conditions would result in Containment Fan Coil Units swapping from High Speed operation to Low Speed operation?

a. Containment Spray pumps just received a valid automatic start signal from SSPS.

b. ALL off-site power becomes deenergized while operating at 100% power.

c. A Rx trip signal is generated in SSPS Train A ONLY.

d. A SBLOCA results in an automatic Safety Injection.

Answer d **Exam Level** R **Cognitive Level** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 022000A301 A3.01 **RO Value:** 4.1 **SRO Value:** 4.3 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Containment Cooling System 022

KA Statement: Ability to monitor automatic operations of the Containment Cooling System including:
Initiation of safeguards mode of operation

Explanation of Answers: 55.41.b(8) A is incorrect because Containment Spray pumps automatically start at 15 psig in containment. The CFCUs would have shifted operation when containment pressure of 4 psig initiated a Safety Injection. B is incorrect because the CFCU's are not loaded on the EDGs upon a MODE II (Blackout) SEC initiation. C is incorrect because a Rx trip signal does not feed into the SEC logic. D is correct because a Safety Injection results in the SEC initiating in MODE I (or 3 if a blackout occurs) which swaps running CFCUs from high speed to low speed. Note: Distracters B and C are different, even though each would result in a Rx trip, since B requires knowledge that a MODE 2 SEC initiation does not start CFCUs, as well as knowledge that a Rx trip does not cause a SEC initiation..

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
RPS Safeguards Actuation Signals	221057			22
Containment Ventilation No. 11 and 12 Fan Coil	203569			18

L.O. Number
CONTMTE008

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 47

Given the following conditions:

- Unit 2 has experienced a double ended rupture of 21 RCS loop cold leg at 100% power.
- Containment Spray automatically initiates, but neither 2CS16 or 2CS17, SPRAY ADD TK MOT OP DISCH Valves open.
- Only 21Containment Spray Pump starts.

Which of the following describes the effect of this failure, and the EARLIEST time the EOP network will direct opening of these valves?

a. Containment pressure may rise above the design pressure of 47 psig. 2-EOP-LOCA-1, Loss of Reactor Coolant, will direct positioning of 2CS16/17 after performing SI reset actions.

b. Containment Sump pH may lower <7.0 and provide inadequate absorption of iodine in the sump liquid. 2-EOP-LOCA-1 will direct positioning of 2CS16/17 after performing SI reset actions.

c. Containment pressure may rise above the design pressure of 47 psig. 2-EOP-TRIP-1, Rx Trip or Safety Injection, will direct positioning of 2CS16/17 when performing Containment Spray Actuation verification step.

d. Containment Sump pH may lower <7.0 and provide inadequate absorption of iodine in the sump liquid. 2-EOP-TRIP-1 will direct positioning of 2CS16/17 when performing Containment Spray Actuation verification step.

Answer d **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 026000A205 A2.05 **RO Value:** 3.7 **SRO Value:** 4.1 **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:
Failure of chemical addition tanks to inject

Explanation of Answers: 55.41.b(9,2) A is incorrect because keeping containment pressure below design pressure is accomplished with CS flow, not additive tank flow, and will be addressed in TRIP-1. B is incorrect because it will occur in TRIP-1. C is incorrect because keeping containment pressure below design pressure is accomplished with CS flow, not additive tank flow. D is correct because FSAR section 6.2 states that the spray add tank, along with borated water provided during injection, assures sump pH >7.0 to ensure adequate absorption of iodine in the sump liquid.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem FSAR		6.2	6.2-21	33

L.O. Number
CSPRAYE004

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 48

Which of the following describes operation of the Containment Iodine Removal Units?

The Containment IRUs are manually started from the Control Room...

a. or Hot Shutdown Panel.

b. per instructions in the EOP Network.

c. on request from Radiation Protection.

d. or automatically started in the SEC SI actuation modes.

Answer	c	Exam Level	R	Cognitive Level	Memory	Facility:	Salem 1 & 2	ExamDate:	5/17/2010

KA:	027000A403	A4.03	RO Value:	3.3*	SRO Value:	3.2*	Section:	SYS	RO Group:	2	SRO Group:	2	55.43

System/Evolution Title: Containment Iodine Removal System | 027

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

Explanation of Answers: 55.41.b(9) A is incorrect because there are no IRU controls on HSD panel. B is incorrect because IRU operation is not contained in any EOP. C is correct per note in S1.OP-SO.CBV-0001, Containment Ventilation Operation, that states when IRUs are to be run. D is incorrect because the SECs do not start IRUs in any Mode.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Containment Ventilation Operation	S1.OP-SO.CBV-0001		9	25

L.O. Number
CONTMTE007

Objectives

Material Required for Examination

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

Question Source Comments: Vision Q80556

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic: RO 49

Which of the following sources of hydrogen in containment during a DBA would MOST likely produce hydrogen in quantities which would require placing a Hydrogen Recombiner in service during performance of EOP-LOCA-1, Loss of Reactor Coolant?

a. Breakdown of reactor coolant chemicals (ammonia, lithium, hydrogen peroxide) when exposed to oxygen.

b. Zirconium-water reaction involving the zirconium fuel cladding and the reactor coolant.

c. Radiolytic decomposition of reactor coolant and containment sump water

d. Corrosion of Zinc and Zinc paint.

Answer: b **Exam Level:** R **Cognitive Level:** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 028000K503 K5.03 **RO Value:** 2.9 **SRO Value:** 3.6* **Section:** SYS **RO Group:** 2 **SRO Group:** 2 55.43

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

KA Statement: Knowledge of the operational implications of the following concepts as they apply to the Hydrogen Recombiner and Purge Control System:
Sources of hydrogen within containment

Explanation of Answers: 55.41.b(9) "When inadequate core cooling has occurred, the containment hydrogen may be as much as 10-12 volume percent, depending on the amount of metal-water reaction(to produce hydrogen) that has occurred in the core." The hydrogen recombiners are put in service if required during performance of LOCA-1 at step 24, between CL Recirc and HL Recirc, less than 4.5 hours since SI actuation.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Reactor Coolant	2-EOP-LOCA-1		46	28

L.O. Number
TAA000E006
CONTMTE001
LOCA01E008

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 50

Which of the following would be the FIRST indication that a 5 gpm leak in the Unit 2 Spent Fuel Pool/ liner has occurred?

a. OHA C-35 SFP Level Lo alarm.

b. Fuel Handling Area Sump hi level alarm.

c. Spent Fuel Pool tell-tale drain flow detector alarm.

d. 2R5 or 2R9 FHB Area Radiation monitors in warning.

Answer a **Exam Level** R **Cognitive Level** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 033000A302 A3.02 **RO Value:** 2.9 **SRO Value:** 3.1 **Section:** SYS **RO Group:** 2 **SRO Group:** 2 55.43

System/Evolution Title: Spent Fuel Pool Cooling System 033

KA Statement: Ability to monitor automatic operations of the Spent Fuel Pool Cooling System including:
Spent fuel leak or rupture

Explanation of Answers: 55.41.b(13) A is correct. B is incorrect because the sump pump is normally aligned in auto, and has a rating greater than 5 gpm, therefore the high level alarm would never annunciate. C is incorrect because while the tell-tale leakage can be seen, it does not have a flow alarm. D is incorrect because all the leakage would be collected under the SFP, then routed through the tell-tales and collected in the sump. The 2R5 and 2R9 are located on a different level and far away from where the leakage would be and wouldn't see an increase in rad levels unless fuel uncovery occurred.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Overhead Annunciators Window C	S2.OP-AR.ZZ-0003		41	17
No. 1 Unit Floor Drains-Contaminated	205226-2			34

L.O. Number

SFP000E006

SFP000E007

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 51

Which of the following identifies the effect of 2R32A, Fuel Handling Crane Area Monitor, failing HIGH?

a. Transfers Fuel Handling Building ventilation to HEPA plus Charcoal filters ONLY.

b. Locks out ALL Fuel Handling Crane motion other than downward motion of suspended load.

c. Locks out lateral movement of the Fuel Handling Crane trolley unless the hoist is in the Full Up position.

d. Transfers Fuel Handling Building ventilation to HEPA plus Charcoal filters, and starts ALL FHB ventilation Exhaust Fans.

Answer: b **Exam Level**: R **Cognitive Level**: Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 034000K602 K6.02 **RO Value:** 2.6 **SRO Value:** 3.3 **Section:** SYS **RO Group:** 2 **SRO Group:** 2 55.43

System/Evolution Title: Fuel Handling Equipment System 034

KA Statement: Knowledge of the of the effect of a loss or malfunction on the following will have on the Fuel Handling Equipment System: Radiation monitoring systems

Explanation of Answers: 55.41(11) A and D are incorrect because the R32A does not affect FHB ventilation, the 2R5 and 2R9 Area Monitors do. C is incorrect because that is a normal crane interlock. B is correct because the R32A interlock only permits lowering a suspended load.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Abnormal Radiation	S2.OP-AB.RAD-0001			27
Unit 2 Fuel Handling Crane	242785			

L.O. Number

ABRAD1E001

Objectives

Material Required for Examination

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

Question Source Comments: Vision Q48703

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 52

With Unit 1 operating at 12% power, which one of the following conditions will cause an AUTOMATIC Rx trip?

a. 14 RCP trips.

b. 2/3 PZR level channels rise to >70%.

c. 2/3 SG NR levels on ANY SG lower to 14%.

d. Main Turbine trip signal generated during startup testing.

Answer c **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 035000K112 K1.12 **RO Value:** 3.7 **SRO Value:** 3.9 **Section:** SYS **RO Group:** 2 **SRO Group:** 2 55.43

System/Evolution Title: Steam Generator System 035

KA Statement: Knowledge of the physical connections and/or cause-effect relationships between Steam Generator System and the following: RPS

Explanation of Answers: 55.41.b(7) A is incorrect because with power > P7 (10% power) but <P-8 (36%), 2 RCP trips are required for Rx trip. B is incorrect because PZR hi level trip is at 90%, 70% is the High Level alarm. C is correct. D is incorrect because Turbine trip does not cause a Rx trip < P-9 (49%) power.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
RPS Primary Coolant system Trip Signals	221054			10
RPS Steam Generator Trip Signals	221056			8
RPS Turbine Trip, Runback, and Generator Prot	221065			14

L.O. Number
STMGENE008
STMGENE014

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 53

Given the following conditions:

- Unit 1 is operating at 7% power during a plant startup.
- Unit 2 is operating at full power.
- 12 SGFP is in service.
- 11 SGFP is idling at 1100 rpm.
- ALL AFW pumps are secured, and the AFW system is aligned for normal power operation.

Which of the following describes how the Unit 1 SGFPs will respond if a Unit 1 MSLI were to occur with NO operator action?

a. BOTH SGFPs will trip.

b. NEITHER SGFP will trip, and both will coast down due to their loss of steam supply.

c. 12 SGFP will trip, 11 SGFP will coast down since its trips will not be enabled at idle speed.

d. BOTH SGFPs would continue to run since they would still be supplied from the Heating Steam System.

Answer b **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 039000K304 K3.04 **RO Value:** 2.5 **SRO Value:** 2.6 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Main and Reheat Steam System 039

KA Statement: Knowledge of the effect that a loss or malfunction of the Main and Reheat Steam System will have on the following: MFW pumps

Explanation of Answers: 55.41.b(4) A MSLI shuts the MSIVs and bypass valves. SGFP trips are always in effect when the SGFP is latched. The "enable/disable" refers to switches 1ND17482/3 this switch is placed in Disable during SGFP latch and warmup for input into the speed deviation alarm, but is returned to enable when idling. It does NOT enable/disable SGFP trips. None of the physical conditions for a SGFP trip will be met. Additionally, no SI or P-14 signal will be generated, which would also trip the SGFPs. They will remain latched, and coast down to a stop (or close to it) due to no motive force. The SGFP steam supply will be swapped to Main Steam prior to exceeding 5% power.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Steam Generator Feed Pump Operation	S1.OP-SO.CN-0002			23
SGFP Speed Deviation	220497			0
Hot Standby to Minimum Load	S1.OP-IO.ZZ-0003			23

L.O. Number MSTEAME015

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 54

Given the following conditions:

- Unit 1 is operating at 100% power when 11 SGFP trips.
- The plant and the control room crew respond as expected, and steady state Tavg and SG NR levels are now present.
- All Steam Generator steam pressures are 915 psig.

Determine the Steam Generator feedwater inlet pressure after steady state conditions have been achieved.

Reference provided.

a. 965 psig.

b. 1020 psig.

c. 1040 psig.

d. 1065 psig.

Answer b **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 059000K303 K3.03 **RO Value:** 3.5 **SRO Value:** 3.7. **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Main Feedwater System 059

KA Statement: Knowledge of the effect that a loss or malfunction of the Main Feedwater System will have on the following: S/Gs

Explanation of Answers: 55.41.b(4)SGFP Master Flow controller develops a D/P signal based on total steam flow which determines the required D/P between SGFP discharge pressure and SG inlet pressure to ensure required flow is provided to SGs. The SGFP trip results in an auto Main Turbine runback to 60% power. Using Attachment 2 of AB.CN-1, it can be determined that the D/P signal lowers from 150 psid at 100% steam flow to 105 psid at 60% steam flow. The stem states steady state conditions are present, so steam dumps will be closed and no extra steam flow will be present. 915+105=1020 psig. The 1065 psig distracter is if the D/P of 150 psid is used. The 965 psig distracter is if the lowest amount (50 psid) The 1040 psig distracter is for continuity.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Main Feedwater/ Condensate System Abnormali	S1.OP-AB.CN-0001	Att 2	20	17

L.O. Number

CN&FDWE008

CN&FDWE017

CN&FDWE016

Objectives

Material Required for Examination RO 54 S1.OP-AB.CN-0001, Rev. 17

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 55

Unit 2 is in MODE 4, performing actions to enter MODE 3.

Which of the following conditions will PROHIBIT entry into MODE 3 IAW Salem Tech Specs?

Assume no special risk assessment will be performed.

a. 21 SW pump C/T, 26 SW pump trips on electrical fault.

b. Rx Engineering reports Shutdown Margin is 1.4% delta k/k.

c. 21 AFW pump is declared INOPERABLE, with 22 and 23 AFW pumps OPERABLE.

d. 21 RCP is in service with the remaining RCPs secured with their RCS loops OPERABLE.

Answer	c	**Exam Level**	R	**Cognitive Level**	Memory	**Facility:**	Salem 1 & 2	**ExamDate:**	5/17/2010

KA:	061000G242	2.2.42	**RO Value:**	3.9	**SRO Value:**	4.6	**Section:**	SYS	**RO Group:**	1	**SRO Group:**	1	55.43	

System/Evolution Title: Auxiliary / Emergency Feedwater System | 061

KA Statement:

Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.

Explanation of Answers:

55.41.b(10) Tech Spec 3.0.4 prohibits entry into a Mode with LCO's not met which if allowed to remain unmet would require placing the plant in a lower mode. A is incorrect because TSAS 3.7.4 requires 2 independent SW loops. S2.OP-SO.SW-0005, Service Water System Operation, Attachment 2 Operability Guidelines, defines 2 operable loops as having one operable pump from each of the 3 vital busses, AND 2 operable pumps in each SW bay, as well as the necessary piping/valves. 21 and 26 are in different SW bays, and are powered from different vital busses. Distracter B is incorrect because TSAS 3.1.1.1 requires 1.3% SDM in Modes 1-4. C is correct because TSAS 3.7.1.2 requires 3 AFW pps operable in Modes 1-3, and with one inoperable per stem, requires placing the unit in HSD. D is incorrect because IAW TSAS 3.4.1.2 only 1 RCP is required to be in operation in Mode 3 with rod control deenergized, while only 2 of the RCS loops are required to be operable. IF a special risk assessment were to be performed IAW 3.0.4.b, MODE ascension COULD be performed, which is why the "Assumption" must be present in stem.

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

L.O. Number
AFW000E010

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 56

Given the following conditions:

- Unit 2 is operating at 100% power when the Rx trips.
- Operators are performing actions in EOP-TRIP-2 Reactor Trip Response.
- AFW flow to each SG is 6E4 lbm/hr with 21 and 22 AFW pumps supplying flow, and 23 AFW pump stopped.
- With 23 SG NR level at 15%, the PO depresses the CLOSE PB for 23AF21, S/G LEVEL CONTROL VALVE, and the valve goes full closed.

Which of the following describes the effect this will have on the AFW flow to the remaining SGs?

a. 21 SG AFW flow will rise, 22 and 24 SG AFW flow will remain the same.

b. 21 SG AFW flow will lower, 22 and 24 SG AFW flow will remain the same.

c. 24 SG AFW flow will rise, 21 and 22 SG AFW flow will remain the same.

d. 24 SG AFW flow will lower, 21 and 22 SG AFW flow will remain the same.

Answer c **Exam Level** R **Cognitive Level** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 061000K503 K5.03 **RO Value:** 2.6 **SRO Value:** 2.9* **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Auxiliary / Emergency Feedwater System 061

KA Statement: Knowledge of the operational implications of the following concepts as they apply to the Auxiliary / Emergency Feedwater System: Pump head effects when control valve is shut

Explanation of Answers: 55.41.b(4) 21 AFW pump feeds 23 and 24 SGs, while 22 AFW pump feeds 21 and 22 SG. Stopping flow to one of two SGs will cause pump head to rise, resulting in a higher flow for the remaining SG supplied form that AFW pp. The 2 AFW pumps discharge is not x-connected, so it will have no effect on the other 2 SGs. The 2 distracters with 21 SG in them are plausible because other systems at Salem have a loop relationship with 1/3 vs. 2/4 being in the same loop.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
	205336			49

L.O. Number
AFW000E015
AFW000E008

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 57

Given the following conditions:

- Unit 2 is operating in MODE 1.
- The Main Generator is ready to be synchronized to the 500KV yard.
- The MAIN GEN SYNC PERMISSIVE green light is NOT illuminating each time the synchroscope indicator is near the 12 o'clock position.
- The MAIN GEN SYNC PERM BYPASS key lock switch is in the NORMAL position.

Which of the following identifies why the light is NOT illuminating near the 12 o'clock position?

a. SYNC POT ON PB is selected.

b. INCOMING voltage is 540KV with RUNNING voltage of 545KV.

c. Synchroscope is rotating once every 30 seconds in the FAST direction.

d. The green light is normally ON and goes DARK when passing through 12 o'clock.

Answer b **Exam Level** R **Cognitive Level** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 062000A403 A4.03 **RO Value:** 2.8 **SRO Value:** 2.9 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: A.C. Electrical Distribution 062

KA Statement: Ability to manually operate and/or monitor in the control room:
Synchroscope, including an understanding of running and incoming voltages

Explanation of Answers: 55.41.b(7) Page 41 of 86 of SO.TRB-1 (rev. 34) lists the conditions which will cause the light to be off. Distracter D is incorrect because the light turns ON at the 12 o'clock position. B is correct because Incoming voltage lower than running voltage will keep synchroscope dark. Distracter A is incorrect because it needs to be on for the light to work, and its on. Distracter C is incorrect because synch rotating FASTER than 1X/ 25-30 seconds will keep light out.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Turbine Generator Startup Operations	S2.OP-SO.TRB-0001			32

L.O. Number
GEN002E012
GEN002E017

Objectives

Material Required for Examination

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

Question Source Comments Vision Q50401

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 58

While performing actions in EOP-LOPA-1, Loss of All AC Power, operators are directed to shed non-essential DC loads.

Which of the following describes the reason for performing that action?

a. Prevent DC fuse failure and/or breaker trips due to high current flow.

b. Lower battery hydrogen generation rates while no ventilation is available.

c. Ensure DC oil pumps continue running until the Main Turbine has stopped rolling.

d. Lower the rate of battery voltage depletion to lengthen operability of vital equipment.

Answer d **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 063000A101 A1.01 **RO Value:** 2.5 **SRO Value:** 3.3 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: D.C. Electrical Distribution 063

KA Statement: Ability to predict and/or monitor changes in parameters associated with operating the D.C. Electrical Distribution controls including: Battery capacity as it is affected by discharge rate

Explanation of Answers: 55.41(4) A is incorrect because fuses and breakers are sized for full load capacity. B is incorrect because while it might happen, it is not the reason. D is incorrect because the LO Pumps are 250VDC, and the 250 VDC is not required for shutdown of plant. D is correct per the basis document of LOPA-1, which states battery power supply must be conserved to permit monitoring and control of the plant until AC power can be restored.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of All AC Power	2-EOP-LOPA-1		45	26

L.O. Number | Objectives

DCELECE011

LOPA00E010

Material Required for Examination

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

Question Source Comments Vision Q78098

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic: RO 59

Given the following conditions:

- Operators are performing the 92 day Train "A" Starting Air Test on 1A EDG IAW S1.OP-ST.DG-001, 1A Diesel Generator Surveillance Test.
- The "B" Air Receiver and Air Starting Motors (1 & 4) have been isolated.
- When operators attempt to start 1A EDG, it times out on overcrank.
- NEITHER Diesel Starting Air Compressor starts.

Which of the following identifies the MINIMUM number of start attempts that are available with the remaining air in 11A Diesel Air Receiver IAW Salem FSAR?

Assume all other conditions for starting the EDG are satisfied.

a. 1

b. 2

c. 3

d. 4

Answer: b | **Exam Level**: R | **Cognitive Level**: Memory | **Facility:** Salem 1 & 2 | **ExamDate:** 5/17/2010

KA: 064000K607 | K6.07 | **RO Value:** 2.7 | **SRO Value:** 2.9 | **Section:** SYS | **RO Group:** 1 | **SRO Group:** 1 | 55.43

System/Evolution Title: Emergency Diesel Generators | 064

KA Statement: Knowledge of the of the effect of a loss or malfunction on the following will have on the Emergency Diesel Generators:
Air receivers

Explanation of Answers: 55.41.b(8) FSAR Section 9.5.6 states that each diesel air receiver is sized to allow for 3 cold starts.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
1A Diesel Generator Surveillance Test.	S1.OP-ST.DG-001		13	42
UFSAR	9.5.6		9.5-43	22
Diesel Engine Auxiliaries	205241-1			42

L.O. Number | Objectives

Material Required for Examination

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

Question Source Comments: 5/2003 Salem NRC Exam. NOT from previous 2 NRC exams.

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 60

Which of the following describes the bases for requiring Process Radiation Monitoring system channels to be OPERABLE?

OPERABILITY of the Process Radiation Monitoring channels ensures...

a. that the 2 hour dose at the site boundary will not exceed an appropriately small fraction of 10 CFR 100 limits.

b. detection and control of leaks that if not controlled could potentially result in the transport of radioactive materials to UNRESTRICTED AREAS.

c. that the release of radioactive materials will be restricted to those leakage paths and associated leak rates assumed in the accident analysis.

d. that radiation levels are continuously monitored in the systems served by the individual channels, and alarm or automatic action is initiated when the radiation level trip setpoint is reached.

Answer d **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 073000G225 2.2.25 **RO Value:** 3.2 **SRO Value:** 4.2 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Process Radiation Monitoring System 073

KA Statement: Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.

Explanation of Answers: 55.41.b(13,12,10) C is incorrect because it is the bases for Tank Level indicating devices under 3.3.3.8. A is incorrect because it is the bases for limiting the specific activity of the reactor coolant under 3.4.9. B is incorrect because it is the bases for maintaining primary containment integrity under 3.61.1. D is correct per the TS Bases for 3..3.3.1

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem Tech Specs		3/4.0 Bases	B 3/4 3-1	

L.O. Number Objectives

RMS000E010

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 61

Given the following conditions:

- Unit 1 is operating at 90% power.
- 11 charging pump is in service.
- 1B 4KV vital bus senses an undervoltage condition.
- The fast transfer of 1B 4KV vital bus to its alternate power supply fails, and the 1B SEC successfully loads its associated equipment on 1B EDG in Mode II*.

Which of the following conditions, if not corrected during performance of S1.OP-AB.4KV-0002, Loss of 1B 4KV Vital Bus, will cause operators to manually trip the Rx?

a. 12 AFW pump running.

b. 1SW26 TG HDR INLET MOV shut.

c. No charging pumps are in service.

d. 12SW122 CCHX SW CONTROL INLET VALVE shut.

Answer b **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 076000A402 A4.02 **RO Value:** 2.6 **SRO Value:** 2.6 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Service Water System 076

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

Explanation of Answers: 55.41.b(7) A is incorrect because the AFW pump starting is not a concern with Rx power <100%, since the power increase due to the cold AFW addition to the SGs will not cause power to rise >100% power. Even then, operators would reduce power if required, not trip the Rx. B is correct because 1B SEC shuts the 1SW26, and cooling water to the Main Turbine will be isolated. This will cause LO and bearing temps to rise, and operators would be required to trip the Main Turbine in a relatively short period of time. With Rx power > P-9 (49%), the Rx trip is initiated vs. just a turbine trip. C is incorrect because the SEC will trip then reload 11 charging pump. This would cause a letdown isolation, and if uncorrected would eventually cause a high PZR level, but the distracter says the reason is because NO charging pumps are running, and 11 will be running. D is incorrect because of all the CCHX's, 12 is the only one which does not have a SW122 that automatically shuts, and even if it did, it only shuts on a Mode III (SI plus Blackout).

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of 1B 4KV Vital Bus	S1.OP-AB.4KV-0002			9
Loss of Service Water-Turbine Header	S1.OP-AB.SW-0002			10
Service Water-Nuclear Area	205242-1			92

L.O. Number
SWBAYSE004

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 62

Given the following conditions:

- Unit 2 was operating at full power when a major earthquake resulted in a Rx trip.
- The AFWST ruptured and has emptied.

Which of the following is the LEAST preferred system which can provide an alternate suction source for the AFW pumps IAW S2.OP-SO.AF-0001, Auxiliary Feedwater System Operation?

a. Service Water.

b. Circulating Water.

c. Demineralized Water.

d. Fresh Water and Fire Protection.

Answer	a	**Exam Level**	R	**Cognitive Level**	Memory	**Facility:**	Salem 1 & 2	**ExamDate:**	5/17/2010

KA:	076000K120	K1.20	**RO Value:**	3.4*	**SRO Value:**	3.4*	**Section:**	SYS	**RO Group:**	1	**SRO Group:**	1	55.43	

System/Evolution Title: Service Water System | 076

KA Statement: Knowledge of the physical connections and/or cause-effect relationships between Service Water System and the following: AFW

Explanation of Answers: 55.41.b(4,8) There are 3 systems which can physically be lined up to provide an alternate source of water to the AFW system. The Circulating Water system can NOT be aligned. Of the remaining 3 above, the order of preference is Demin, Fresh Water/Fire Protection, then Service Water.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Auxiliary Feedwater System Operation	S2.OP-SO.AF-0001		54	33
Aux Feedwater Unit 1	205236			54
Aux Feedwater Unit 2	205336			49

L.O. Number | **Objectives**

SW0NUCE015

Material Required for Examination

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

Question Source Comments Q61587 modified stem to make operational type question vs straight alternate water source question.

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 63

Which of the following describes how Control Air will be provided to the units following a complete loss of all AC power?

The Station Blackout Compressor...

a. is manually started and provides flow through normally aligned check valves.

b. automatically starts and provides flow through normally aligned check valves.

c. is manually started and provides flow through manually opened isolation valves.

d. automatically starts and provides flow through manually opened isolation valves.

Answer c **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 078000K402 K4.02 **RO Value:** 3.2 **SRO Value:** 3.5 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Instrument Air System 078

KA Statement: Knowledge of Instrument Air System design feature(s) and or interlock(s) which provide for the following:
Cross-over to other air systems

Explanation of Answers: 55.41.b(7) The SBO compressor is a diesel driven compressor. It is manually started, and manually aligned to supply Control Air following a station blackout.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Control Air	S2.OP-AB.CA-0001		3.35	16
Control Air	205347-2			40
Yard -Control Air-Station Blackout	604495			2

L.O. Number

CONAIRE013

Objectives

Material Required for Examination

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

Question Source Comments Vision Q67883 used concept of auto start of SBO and expanded it to how it supplies CA header

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 64

In addition to the local Hose Reel stations, which of the following, if any, is a fire protection/suppression system provided at the Service Water Structure?

a. Deluge system for each pump bay.

b. Sprinkler system for the Control House.

c. Foam suppression for the Heating Furnaces.

d. None of these systems are present at the Service Water Structure.

Answer d **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 086000K101 K1.01 **RO Value:** 3.0* **SRO Value:** 3.4* **Section:** SYS **RO Group:** 2 **SRO Group:** 2 55.43

System/Evolution Title: Fire Protection System 086

KA Statement: Knowledge of the physical connections and/or cause-effect relationships between Fire Protection System and the following: High-pressure service water

Explanation of Answers: 55.41.b(4,7) The only fire protection system provided at the Service Water Structure are manual hose reels.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Fire Protection System	NOS05FIRPRO-06		23	6

L.O. Number

FIRPROE007

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 65

Given the following conditions:

- Salem Unit 2 has experienced a major rupture of a RCS cold leg.
- Both RHR pumps have been injecting at maximum flow since the rupture occurred 10 minutes ago.

With all systems actuating as expected, which of the following choices identifies the containment isolations which have occurred, and the reason why they have occurred?

a. Main Steamline to minimize potential primary-to-secondary leakage; Feedwater to prevent uncontrolled filling of any SG.

b. Phase A to ensure non-essential containment penetrations are isolated; Phase B to isolate additional potential release paths from containment.

c. Phase B to isolate potential injection paths to containment; Containment Ventilation to ensure non-essential containment ventilation penetrations are isolated.

d. Phase A to ensure non-essential containment penetrations are isolated; Feedwater to isolate ALL feedwater to containment to preclude an excessive RCS cooldown event.

Answer b **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 103000A101 A1.01 **RO Value:** 3.7 **SRO Value:** 4.1 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Containment System 103

KA Statement: Ability to predict and/or monitor changes in parameters associated with operating the Containment System controls including: Containment pressure, temperature, and humidity

Explanation of Answers: (55.41.b.7,9)All of the isolations in the choices above do occur during a LOCA in which containment pressure goes above 15 psig. The conditions stated in the stem indicate containment pressure is > 15 psig. (RHR pumps injecting at maximum rate) Only the correct answer b contains the correct reasons for its respective isolations. Distracter d is incorrect because Feedwater Isolation only isolates Main Feedwater, it does not isolate ALL feedwater. AFW is still available for injection to SG's. Distracter c is incorrect because Phase B isolates leakage paths, not injection paths. Distracter a is incorrect because Main Steamline Isolation is designed to minimize and/or terminate the mass and energy releases associated with a high energy secondary line break.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Rx Trip or Safety Injection	2--EOP-TRIP-1			27

L.O. Number

LOCA01E007

LOCA01E008

Objectives

Material Required for Examination

Question Source: Previous 2 NRC Exams **Question Modification Method:** Editorially Modified **Used During Training Program**

Question Source Comments 07-01 NRC RO Exam, modified stem to remove containment pressure, added RHR pump status so candidate has to determine that containment pressure is >15 psig.

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 66

Which of the following may be EXCLUDED when determining a covered individual's calculated work hours IAW LS-AA-119, Fatigue Management and Work Hour Limits?

a. An individual performs work outside the Protected Area.

b. An individual reports 1 hour early for assigned shift to receive missed requal training.

c. An individual is required to participate in an event investigation after their normal shift has ended.

d. An individual reports to the Emergency Operations Facility (EOF) to perform assigned duties during an unannounced emergency preparedness drill.

Answer d **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 194001G101 2.1.1 **RO Value:** 3.8 **SRO Value:** 4.2 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: GENERI

KA Statement: Knowledge of conduct of operations requirements.

Explanation of Answers: When calculating work hours which must be counted as hours accumulated toward the work hours limitations, all Covered and Non-Covered work is required to be included. However, in Section 4.2, Calculating Work Hours, specific exclusions from this requirement are stated, such as: 4.2.8, "Unscheduled work hours for the purpose of participating in unannounced emergency preparedness exercises and drills may be excluded." A is incorrect because covered work is performed outside the Protected area (i.e.switchyard operations.) B is incorrect because 4.2.6 states early arrivals and late departures for required meetings, training....shall be included. C is incorrect because 4.2.6 states holdovers for interviews needed for event investigations is counted.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Fatigue Management and Work Hour Limits	LS-AA-119			6

L.O. Number

CONDOPE005

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 67

Which of the following is an acceptable report to the CRS during emergency conditions IAW HU-AA-101, Human Performance Tools and Verification Practices?

a. Charging Systems SI systems flow meter indication is decreasing.

b. Steam Generator level is 50% and lowering rapidly.

c. Phase A has been reset on both SSPS trains.

d. The pump has tripped.

Answer c **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 194001G118 2.1.18 **RO Value:** 3.6 **SRO Value:** . **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: GENERI

KA Statement:

Ability to make accurate, clear and concise logs, records, status boards, and reports.

Explanation of Answers:

55.41.b(10) Procedure states in section 4.4.5 that..." Communication of indicator reading should be provided in the format of PARAMETER-VALUE-TREND (with rate when appropriate)." It also states in 4.4.1 that..."ENSURE all communications are clear, concise, and free of ambiguity." Using the word "lost" does not define the indication, it does not give status of indication. C is correct because is gives specific train/component and current status. A is incorrect because words that can be mistaken for each other are to be avoided (increase/decrease. (4.4.4) B is incorrect because SG level can be narrow range or wide range with large difference between the two.. D is incorrect because it is non specific.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Human Performance Tools and Verification Prac	HU-AA-101	4.4	10	5

L.O. Number

Objectives

Material Required for Examination

Question Source: Previous 2 NRC Exams **Question Modification Method:** Editorially Modified **Used During Training Program**

Question Source Comments 8/2008 Salem RO exam Q65, added procedure reference in stem. Modified Choice A from "lost" to "is decreasing".

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 68

Given the following conditions:

- Unit 1 is in Mode 5 returning from a refueling outage.
- 11 RHR loop is in shutdown cooling mode, 12 RHR loop has been aligned for ECCS.
- 13 RCP is in service.

Which of the following identifies an action that will be performed in response to placing the second RCP in service?

a. 1CV75 PZR AUX SPRAY STOP VALVE will be cycled to maintain PZR pressure <340 psig.

b. 11-14 MS10 MS PWR RELIEF VALVE will be adjusted to 100 psig to prevent an inadvertent Mode change.

c. PZR Master Pressure controller AUTO setpoint will be adjusted to a lower pressure to accommodate the PZR insurge.

d. 11RH18 RHR HX FLOW CONT V and 1RH20 RHR HX BYP VALVE will be adjusted to maintain RCS temperature <200 degrees.

Answer d **Exam Level** R **Cognitive Level** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 194001G202 2.2.2 **RO Value:** 4.6 **SRO Value:** . **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: GENERI

KA Statement:

Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.

Explanation of Answers:

55.41.b(5,10) RCPs are started after a PZR bubble has been established at step 5.1.6.C. A is incorrect because aux spray flow will not be required with 13 RCP already in service providing normal spray flow. B is incorrect because the MS10 setpoints are not adjusted to 100 psig until RCS temp >200 deg (MODE 4) with the correct reason (Step 5.2.26). C is incorrect because PZR pressure control will be manually controlled (Step 5.1.6.A). D is correct because the heat input from the RCP will cause RCS temperature to rise, and flow through and bypassing the inservice RHR HX will have to be adjusted to maintain temperature, otherwise the RCS would continue to heatup and enter Mode 4 (>200 deg).

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Cold Shutdown to Hot Standby	S1.OP-IO.ZZ-0002			38
Reactor Coolant Pump Operation	S1.OP-SO.RC-0001			29

L.O. Number | Objectives

IOP002E004

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 69

Which of the following Unit 2 situations has the LEAST amount of time to respond to the Tech Spec LCO before a power reduction or action to move to lower MODE would be REQUIRED by the associated action of the Tech Spec?

Reference provided.

a. 75% power, AFD is -26%.

b. MODE 2, a single Reactor Coolant Pump trips.

c. RCS pressure peaks at 2485 psig following a Reactor Trip/Safety Injection.

d. MODE 3, the weekly Containment Air Lock surveillance of the 100' elevation airlock is UNSAT.

Answer a **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 194001G239 2.2.39 **RO Value:** 3.9 **SRO Value:** 4.5 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: GENERI

KA Statement: Knowledge of less than or equal to one hour Technical Specification action statements for systems.

Explanation of Answers: 55.41.b(10,5) A is correct because with the parameters given, the AFD is outside the "doghouse" shown in COLR Figure 2. This requires implementation of TSAS 3.2.1, Action 2.a.2, which states that power operation may continue if the indicated AFD is within the limits as specified in the COLR. They are not, and the action further states that if not then reduce thermal power to <50% within the next 30 minutes. B is incorrect because the action time for 3.4.1.1 not having all 4 RCPs running in MODE 2 is one hour. C is incorrect because the setpoint for implementing 2.1.2 (within 5 minutes) is 2735 psig. D is incorrect because 3.6.1.1 Primary Containment Integrity gives an hour to restore, then in this case CSD within the next 30 hours.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem Tech Specs		2, 3/4	2-3, 3/4 2	

L.O. Number

FLUNCYE002

Objectives

Material Required for Examination RO 69 Unit 2 COLR Figure 2

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 70

During shift turnover, the on-coming RO notices an OHA with reflash capability has 1 (one) piece of red translucent tape diagonally across its window box.

Which of the following describes what the status of this OHA is?

a. The alarm is inoperable, and will not annunciate under any circumstances.

b. The alarm is identified for heightened awareness, and has all functionality present.

c. The alarm has at least one, but not all, inputs disabled, and may not be a reliable source of information.

d. The alarms reflash capability has been defeated such that if already in alarm, a second alarm will not be annunciated.

Answer c **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 194001G243 2.2.43 **RO Value:** 3.0 **SRO Value:** 3.3 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: GENERI

KA Statement: Knowledge of the process used track inoperable alarms.

Explanation of Answers: 55.41.b(10) The single piece of tape is placed on the OHA to alert the operator that the alarm is not a reliable source of information. 2 pieces of red tape in a "X" signifies that the entire OHA window is INOPERABLE. Additionally, if one or more inputs to a multiple input annunciator are inoperable, then red tape should be placed diagonally across the annunciator window. A is incorrect because the window can still alarm from an operable input, since it is not ("X'd). B is incorrect because the tape signifies that there is something wrong with it, so it does NOT have full functionality. C is correct as per above. D is incorrect because the reflash capability is not defeated, and as long as a second valid input comes in with one already in, the reflash capability of the alarm will cause it to annunciate.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Operator Burdens Program	OP-AA-102-103-1001	5.1.3	3	0

L.O. Number

OHA000E008

OHA000E013

MISCODE008

Objectives

Material Required for Examination

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

Question Source Comments Q57292 Made more specific, and changed correct answer.

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 71

While attending an Initial Licensed Operator Training course in 2010, an individual receives 75 mrem Total Effective Dose Equivalent (TEDE) year to date.

Which of the following is the MOST external radiation exposure this individual can receive for the remainder of 2010 under NORMAL circumstances without violating the PSEG Nuclear Administrative Dose Control Level IAW RP-AA-203, Exposure Control and Authorization?

a. 1925 mrem.

b. 2000 mrem.

c. 4425 mrem.

d. 4925 mrem.

Answer a **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 194001G304 2.3.4 **RO Value:** 3.2 **SRO Value:** 3.7 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: GENERI

KA Statement: Knowledge of radiation exposure limits under normal or emergency conditions.

Explanation of Answers: 55.41.b(12) The PSEG Nuclear ADCL is 2,000 mrem TEDE. 2000-75=1925. B is plausible if the previous dose is no factored in. C is plausible because it is the result if an Emergency of ALERT or higher were declared, but the stem states normal conditions. D is plausible because it is based on the 5R / yr NRC limit.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Exposure Control and Authorization	RP-AA-203			4
Operational Support Center (OSC) Radiation Pr	NC.EP-EP-ZZ-0304			12

L.O. Number

RADCONE002

Objectives

Material Required for Examination

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

Question Source Comments Q60952 modified from straight 2,000 mrem/yr to a calculation.

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 72

Given the following conditions:

- Unit 2 is in MODE 3, NOP, NOT.
- You have been assigned to a team of workers going into containment to investigate a possible leak.
- ALL areas of containment will have to be inspected.

Which of the following conditions would require an ALARA review, a detailed pre-job brief, and a documented risk analysis and management approval?

References provided.

a. Use of a man-lift over the Rx cavity is required.

b. The search team contains more workers than can occupy the airlock at one time.

c. An area in containment has a maximum deep dose equivalent rate of 12R/hr at 30 cm.

d. An area in containment contains radiation levels which could result in an absorbed dose of 8 rad in 30 minutes 1m from the radiation source.

Answer c **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

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: GENERI

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

Explanation of Answers: 55.41.b(12) The condition stated in C meets the criteria for a Level 2 Locked High Radiation Area. RWP-2 is the correct RWP for these radiation levels, even though there is a specific RWP-3 for Containment Entries in Mode 3. RWP-3 does NOT allow entry into Level 2 LHRA's, RWP-2 specifically is for those levels AND includes going in to containment. The remaining 2 choices could not be radiation levels, since a choice with a lower radiation level could not be true without the higher level also being true, so they are high risk activities that are plausible but do not require the things that RWP-2 requires be performed. C is incorrect because the limit is 400 Rad/hr to be a VHRA.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Controls for High and Very High Radiation Areas	RP-AA-460			13
Salem RWPs				

L.O. Number

RADCONE004

Objectives

Material Required for Examination RO 72 RP-AA-460, pages 1-5, RWPs 1-3

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 73

Which of the following evolutions performed by Operations Dept personnel will require Radiation Protection support due to potential radiation/contamination hazards?

a. Placing 22 Hydrogen Recombiner in service during a LOCA IAW S2.OP-SO.CAN-0001, Hydrogen Recombiner Operation.

b. Performing a 21 Waste Gas Decay Tank release IAW S2.OP-SO.WG-0008, Discharge of 21 Gas Decay Tank to Plant Vent.

c. Performing a Containment Pressure Relief IAW S2.OP-SO.CBV-0002, Containment Pressure - Vacuum Relief System Operation.

d. Releasing 21 CVCS Monitor Tank directly to the circulating Water System IAW S2.OP-SO.WL-0001, Release of Radioactive Liquid Waste from 21 CVCS Monitor Tank

Answer d **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 194001G314 2.3.14 **RO Value:** 3.4 **SRO Value:** 3.8 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: GENERI

KA Statement:

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

Explanation of Answers:

55.41.b(12) D is correct because releasing a Monitor Tank directly to Circ Water requires rotation of a potentially contaminated spectacle flange. None of the other evolutions require HP support, even though they deal with systems that either are located in areas which are high rad, or contain radioactive material.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Release of Radioactive Liquid Waste from 21 C	S2.OP-SO.WL-0001			23

L.O. Number

WASLIQE012

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 74

A problem has occurred at Salem Unit 1 which results in the declaration of an ALERT.

Which of the following actions is required to be performed by the Secondary Communicator at Salem?

Assume the ALERT is the first emergency classification made.

a. The Emergency Response Data System (ERDS) must be activated within 15 minutes of the Alert declaration.

b. The Emergency Response Data System (ERDS) must be activated within 60 minutes of the Alert declaration.

c. Complete the Major Equipment and Electrical Status (MEES) Form and update it every 15 minutes.

d. Complete the Operational Status Board (OSB) Form, and update it every 60 minutes.

Answer b **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 194001G412 2.4.12 **RO Value:** 4.0 **SRO Value:** . **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: GENERI

KA Statement:

Knowledge of general operating crew responsibilities during emergency operations.

Explanation of Answers: 55.41.b(10) A is incorrect and B is correct because ERDS must be activated within 60 minutes of ALERT declaration. C is incorrect because it is updated after significant plant change or classification change. D is incorrect because the OSB is updated every 15 minutes if requested by the TSC.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem ECG		Attachment 8	1-3	22

L.O. Number

GENISSE013

Objectives

Material Required for Examination

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

Question Source Comments VISION Q60033

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic RO 75

During a plant startup following a forced outage, the following conditions are present:

- Reactor power is 18%.
- The Main Turbine is rolling at 1800 rpm.
- The Main Generator is NOT synched to the grid.
- Rod Control is in MANUAL, with Control Bank D rods at 160 steps withdrawn.
- Steam dumps are in MS Pressure Control Mode- AUTO.

The oncoming NCO notices OHA's E-5, "SR DET VOLT TRBL" and E-21, "SR HI FLUX AT S/D BLOCKED" are illuminated, and questions their validity at this Reactor Power level.

These 2 OHA's are...

a. invalid, they should have cleared when Permissive P-10 energized.

b. invalid, they should have cleared when the Main Turbine was latched.

c. valid, they will clear when TURBINE POWER STEAMLINE INLET PRESS, BELOW P-7 lamp is extinguished.

d. valid, they will clear when TURBINE POWER STEAMLINE INLET PRESS, BELOW P-2 lamp is extinguished.

Answer d **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 194001G446 2.4.46 **RO Value:** 4.2 **SRO Value:** . **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: GENERI

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

Explanation of Answers: 55.41.b(7) A is incorrect because while Permissive P-10 energizes when 2/4 PR NIs are >10% power, it does not feed into these OHA's. B is incorrect because the Turbine latch will not cause Turbine Steamline inlet pressure Pt-505 (indicative of actual turbine power) to rise above 15%. C is incorrect because while the alarm is valid, and the below P-7 light will have extinguished, it does not feed into the OHS circuit. D is correct because these 2 alarms will remain energized until PT-505, Turbine Steamline inlet pressure CH I is >15% turbine load, which will not happen until the generator is online and loaded. Permissive P-2 is PT-505>15%. Below P-2 extinguished means >P-2.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Overhead Alarm Window E	S2.OP-AR.ZZ-0005		8,31	18
RPS NI Permissives and Blocks	221053			8
RPS Turbine trips, runback, and Generator Prot	221065			14

L.O. Number

IOP003E004

IOP003E005

Objectives

Material Required for Examination

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

Question Source Comments Vision Q69492 changed choices format from steam pressures associated with steamline inlet pressure to Permissive lights on 2RP4

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic SRO 1

Given the following conditions:

- Unit 2 is operating at 75% power, EOL.
- RCS boron concentration is 100 ppm.
- Control Bank D is at 144 steps.

Which of the following contains both a condition which would cause control rods to withdraw continuously, and the interlock which would stop the rod withdrawal with NO operator action?

a. 2CV175 Rapid Borate Stop valve opens. Control Grade Interlock C-11.

b. 22 RC loop Th temperature detector fails low. Control Grade Interlock C-4.

c. An un-borated CVCS Mixed Bed Demineralizer is placed in service. Control Grade Interlock C-2.

d. 2PT-505 Main Steamline Turbine Inlet Pressure transmitter fails high. Control Grade Interlock C-3.

Answer a **Exam Level** S **Cognitive Level** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 000001A202 AA2.02 **RO Value:** 4.2 **SRO Value:** 4.2 **Section:** EPE **RO Group:** 2 **SRO Group:** 2 55.43 ☑

System/Evolution Title: Continuous Rod Withdrawal 001

KA Statement: Ability to determine and interpret the following as they apply to Continuous Rod Withdrawal:
Position of emergency boration valve

Explanation of Answers: 55.43(6) 2CV175 opening will cause boric acid flow to the charging pumps suction and into the RCS. Control rods will start stepping out and will continue to withdraw in response to the lowering temperature caused by the negative reactivity insertion. Power will remain fairly constant, since steam demand is not changing, so RC loop delta T will remain constant. Control rods will withdraw until C-11 is reached, which is the "all rods out" interlock and stops auto rod withdrawal. The RC loop temp detector failing low will NOT cause rods to step out due to the input into rod control being the auctioneered HIGH Tavg signal. Placing an unborated mixed bed will LOWER RCS boron concentration as it removes boron to saturate itself. This would cause temp to RISE, and rods would move in. PT-505 failing high would initially cause rods to rapidly withdraw, but the power mismatch and the high level clip of the 1st stage pressure signal act to stop rod withdrawal prior to all rods out or any Delta T signal. Power peaks around 85%, and rods will actually begin to insert due to the power mismatch portion of rod control. The C-2, C-3 and C-4 interlocks all act to block rod withdrawal, and are 103% power, within 3% of OT/DT limit and 3% of OP/DT limit respectively.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Licensed Operator Fluency List	NOS05FLUNCY-05		11	5
Rod Control and Rod Blocks	221058			06

L.O. Number
RODS00E008
CVCS00E008

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 SRO 2

Given the following conditions:

- Unit 1 is operating at 100% power.
- Rx Engineering has confirmed a leaking fuel pin this cycle.
- A Containment Pressure Relief is in service IAW S1.OP-SO.CBV-0002, Containment Pressure - Vacuum Relief, and 1VC5 and 1VC6 CONT PRESS/VAC RELIEF ISOL are open.
- The pressure relief was started with BOTH 1R12A, Containment Noble Gas and 1R41D Plant Vent Noble Gas INOPERABLE as allowed by the procedure.
- 1R12A is INOPERABLE due to the Containment APD Sample Pump being O/S.

Which of the following describes how 1VC5 and 1VC6 will be shut if a PZR steam space leak were to occur and cause containment radiation levels to rise?

Assume a Rx Trip/Safety Injection are NOT required.

a. 1R45D, Plant Vent Filter, will automatically shut 1VC5 and 1VC6 upon receipt of a Hi Radiation Alarm signal.

b. 1R11A, Containment Particulate, will automatically shut 1VC5 and 1VC6 upon receipt of a Hi Radiation Alarm signal.

c. Operators will be required to initiate close on 1VC5 and 1VC6 from the control room, since no automatic isolation will occur.

d. Operators will be required to initiate a Containment Ventilation Isolation from the Safeguards Bezel, which sends a close signal to 1VC1-1VC6.

Answer c | **Exam Level** S | **Cognitive Level** Comprehension | **Facility:** Salem 1 & 2 | **ExamDate:** 5/17/2010

KA: 000008G311 | 2.3.11 | **RO Value:** 3.8 | **SRO Value:** 4.3 | **Section:** EPE | **RO Group:** 1 | **SRO Group:** 1 | 55.43 ✔

System/Evolution Title: Pressurizer Vapor Space Accident | 008

KA Statement:

Ability to control radiation releases.

Explanation of Answers:

55.43(4) 1R11A choice is incorrect because it, along with the 1R12A and 1R12B are the Containment APD. If the sample pump is O/S, then no air flow from containment is being pumped through the unit, and none of the 3 detectors will see the increase in radiation, NOR will they perform their cont isolation function. The pressure release is specifically allowed to start with the 1R12A and 1R41D inop, as long as requirements for double sample/analysis is performed. The R45D does not perform any isolation functions. The control room will be required to shut the VC5 and 6, since no auto isolation would occur. The R41A low range monitor would still be available to provide the indications in the stem. The initiation of a CVI signal would send a close signal to 1VC1,4,5 and 6, since valves VC2 and VC3 were removed during a DCP.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Containment Pressure-Vacuum Relief	S1.OP-SO.CBV-0002			21
Off Site Dose Calculation Manual	Salem ODCM		24-26	24
Abnormal Radiation	S1.OP-AB.RAD-0001		15-18	31

L.O. Number

LOCA01E007

Objectives

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

Comment

Additional reference NOS05RMS000-10 Rev 10 pages 20-21 for Containment APD operation.

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic SRO 3

Given the following conditions:

- Unit 2 was operating at 100% power when a 500 gpm SBLOCA occurred.
- Operators are performing actions in EOP-TRIP-1, Rx Trip or Safety Injection.

Which of the following would prevent charging pump ECCS flow from being present, and when is the EARLIEST that action will be directed to establish it?

a. NEITHER 2SJ12 nor 2SJ13, BIT OUTLET VALVES repositions; during Safeguards Valve Alignment in TRIP-1.

b. NEITHER 2SJ4 nor 2SJ5, BIT INLET VALVES repositions; after SI reset in LOCA-1, Loss of Reactor Coolant.

c. VCT OUTLET STOP VALVES 2CV40 shuts and 2CV41 remains open; during Safeguards Valve Alignment in TRIP-1.

d. RWST TO CHG PMPS STOP VALVES 2SJ1 opens and 2SJ2 remains shut; after SI reset in LOCA-1, Loss of Reactor Coolant.

Answer a **Exam Level** S **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 000009A213 EA2.13 **RO Value:** 3.4 **SRO Value:** 3.6 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43 ☑

System/Evolution Title: Small Break LOCA 009

KA Statement: Ability to determine and interpret the following as they apply to Small Break LOCA:
Charging pump flow indication

Explanation of Answers: 55.43(5) B is incorrect because the BIT inlet valves would be positioned correctly in TRIP-1. (Right condition, wrong procedure) A is correct because the 2 parallel valves are normally shut, and would be positioned correctly in TRIP-1. C is incorrect because these 2 valves are in series, and only one has to open. (Wrong condition, right procedure) D is incorrect because these 2 valves are in parallel, and only one has to open.(Wrong condition, wrong procedure)

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Reactor Trip or Safety Injection	2-EOP-TRIP-1			27

L.O. Number

TRP001E021

Objectives

Material Required for Examination

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

Question Source Comments

Comment

Question Topic SRO 4

Given the following conditions:

- Unit 1 is responding to a LBLOCA.
- When the crew is performing SI reset actions in 1-EOP-LOCA-1, Loss of Reactor Coolant, ONLY Train A SI will reset on the Safeguards Bezel.
- Operators continue in LOCA-1, and transition to 1-EOP-LOCA-3, Transfer to Cold Leg Recirculation, when required.

Which of the following identifies how the Control Room Supervisor would direct the ECCS system to be realigned to Cold Leg Recirc?

a. RHR pumps will be unable to be stopped when realigning suction to containment sump. Go to 1-EOP-LOCA-5, Loss of Emergency Recirculation.

b. A loss of off-site power will cause the SECs to load in MODE II, and Safeguards loads will have to be manually restarted while continuing in LOCA-3.

c. 11SJ44 and 12SJ44 CONT SUMP SUCT VALVES will not be able to be opened after 11RH4 and 12RH4 RHR PUMP SUCT MOV are shut. Go to 1-EOP-LOCA-5.

d. 11CC16 and 12CC16, RHR HX COMP CLG OUT valves would not open when operators armed them at 15.2' RWST level. Continue in LOCA-3 while dispatching operators to locally open the CC16 valves.

Answer b **Exam Level** S **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 000011A202 EA2.02 **RO Value:** 3.3* **SRO Value:** 3.7* **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43 ☑

System/Evolution Title: Large Break LOCA 011

KA Statement: Ability to determine and interpret the following as they apply to Large Break LOCA:
Consequences to RHR of not resetting safety injection

Explanation of Answers: 55.43(5) When performing LOCA-1, SI reset actions occur early in the procedure. When SI on train B does not reset, the SI input signal to the SECs will remain. The procedure then BLOCKS this signal when the SEC's can not be reset. This BLOCK remains in place, so when the loss of off-site power occurs after SECs have been reset, the SECs will NOT have a SI input signal, and will load in MODE II (Blackout). The Step 3 CAUTION in LOCA-3 prior to Safeguards Reset states that if a loss of off-site power occurs after SI reset, then safeguards loads will have to be manually restarted. A is incorrect because the SECs WILL be blocked and reset, and the RHR pumps CAN be stopped. C is incorrect because the SJ44 and RH4 valves are able to be positioned. D is incorrect because there is no auto arming capability on UNIT ONE.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Reactor Coolant	1-EOP-LOCA-1			25
Transfer to Cold Leg Recirculation	1-EOP-LOCA-3			27
RPS Safeguards Actuation Signals	221057			22

L.O. Number
LOCA01E006
ECCS00E008
SEC000E005

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 SRO 5

Given the following conditions:

- Unit 1 is operating at 100% power.
- Charging system problems result in NO Unit 1 charging pumps running OR being available to be run.
- The decision is made to align and run 23 charging pump (Unit 2) from Unit 2 RWST to the Unit 1 CVCS system IAW S1.OP-AB.CVC-0001, Loss of Charging.
- The proper lineup is completed, and 23 charging pump is now supplying the Unit 1 charging system.
- Unit 1 PZR level is rising very slowly.

Which of the following identifies the next action to be performed, and why?

a. Commence a Unit 2 shutdown IAW S2.OP-IO.ZZ-0004, Power Operation, due to the loss of Unit 2 RWST level.

b. Commence a Unit 1 shutdown IAW S1.OP-IO.ZZ-0004, Power Operation, due to the boration of the RCS from Unit 2 RWST.

c. Reestablish normal letdown on Unit 1 IAW S1.OP-SO.CVC-0001, Charging, Letdown, and Seal Injection, to control PZR level.

d. Adjust 11-14CV98 RCP SEAL WTR FLOW ADJ VALVES, IAW S1.OP-SO.CVC-0001, Charging, Letdown, and Seal Injection, to ensure 6-12 gpm flow to each RCP.

Answer b **Exam Level** S **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 000022A202 AA2.02 **RO Value:** 3.2 **SRO Value:** 3.7 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43 ☑

System/Evolution Title: Loss of Reactor Coolant Makeup 022

KA Statement: Ability to determine and interpret the following as they apply to Loss of Reactor Coolant Makeup: Charging pump problems

Explanation of Answers: 55.41(5) B is correct because the RWST boron concentration is always going to be higher than the RCS boron at power, and will result in a continuous boration of Unit 1. (AB.CVC-1 Step 3.49) A is incorrect because RWST level is monitored, and if it approaches minimum level, continued operation of 23 charging pump will be evaluated or other contingency actions implemented (AB.CVC-1 Step 3.49 NOTE) C is incorrect because normal letdown can NOT be restored since the letdown isolation valves are interlocked with the charging pump breakers such that at least ONE charging pump breaker has to be shut to open letdown isolation valves. Excess letdown may be placed in service to control PZR level. D is incorrect because while seal injection flow adjustment might have to be made, it is done by throttling 1CV71CHG HDR PCV, not adjusting manual valves in the field.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Charging	S1.OP-AB.CVC-0001			7
Charging, Letdown, and Seal Injection	S1.OP-SO.CVC-0001			32

L.O. Number

ABCVC1E003

Objectives

Material Required for Examination

Question Source: Previous 2 NRC Exams **Question Modification Method:** Editorially Modified **Used During Training Program** ☐

Question Source Comments 8/2008 NRC SRO Exam replaced distracter d because it occurs in procedure to close to when correct answer is performed

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic SRO 6

Given the following conditions:

- Unit 2 is operating at 100% power, MOL.
- 21 SGFP trips.
- NO operator action is taken in response to the SGFP trip.

Which of the following is an UNEXPECTED alarm if it is locked in 2 minutes after 21 SGFP trips, and what procedure would be used to address the condition associated with that unexpected alarm?

a. OHA G-3, EHC SYS TRBL. S2.OP-AB.TRB-0001, Turbine Trip Below P-9.

b. Console Alarm RC PRESS DEVIATION HI. S2.OP-AB.PZR-0001, Pressurizer Pressure Malfunction.

c. OHA G-44, COND POL TRBL. S2.OP-AB.CN-0001 Main Feedwater/Condensate System Abnormality.

d. Console Alarm RC LOOPS TAVG-TREF DEVIATION. S2.OP-AB.ROD-0001, Immovable/Misaligned Control Rods.

Answer b **Exam Level** S **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 000054G446 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 Main Feedwater 054

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

Explanation of Answers: 55.43(5) The condensate polisher trouble alarm will be in alarm due to the CN108s AND the CN109 being open at the same time. D is incorrect because RC loops Tavg-Tref deviation will be expected as rods are driving in due to the turbine runback to 65%. The ARP has operators place rods in manual, and if not successful at restoring conditions, going to AB.ROD-01. B is correct because the RC pressure deviation would not be expected, since the setpoint (+75 psig deviation)equates to when the spray valves are full open. The spray valves should be shut after the insurge due to the load rejection and then the large amount of inward rod motion. The alarm response directs entry into AB.PZR-0001. A is incorrect because G-3 will be in alarm since it receives input from the EHC Control and Status computer, which has a Loss of Feed pump Runback alarm in, and the ARP directs performance of SO.TRB-2 to reduce power if a steam valve has shut.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Control Console 2CC2	S2.OP-AR.ZZ-0012		36	35
Overhead Annunciators Window G	S2.OP-AR.ZZ-0007		68-69, 8	44

L.O. Number

ABCN01E004

ABCN01E005

Objectives

Material Required for Examination

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

Question Source Comments Additional Reference S2.OP-AB.CN-0001, Main Feedwater/Condensate System Abnormality Rev.24 page 6

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic SRO 7

Given the following conditions:

- Unit 2 is operating at 100% power.
- The performance of the daily RCS leak rate calculation determines that Unidentified Leakage has risen from 0.07 gpm to 0.50 gpm.
- Shortly after the RCS leak rate is performed, Chemistry reports that a routine sample of the RCS indicates that DEI-131 is 8 uCi/gm, and a second sample confirms the elevated reading.
- 2R31, Letdown Line Radiation Monitor is NOT in alarm.

Which of the following is the FIRST regulatory notification required if Rx power and RCS activity levels remain at these levels?

References provided.

a. 1 hour report.

b. 4 hour report.

c. 8 hour report.

d. Declaration of an Unusual Event.

Answer d **Exam Level** S **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 000076G441 2.4.41 **RO Value:** 2.9 **SRO Value:** 4.6 **Section:** EPE **RO Group:** 2 **SRO Group:** 2 55.43 ☑

System/Evolution Title: High Reactor Coolant Activity 076

KA Statement: Knowledge of the emergency action level thresholds and classifications.

Explanation of Answers: 55.43(5) Tech Spec 3.4.9 for RCS activity will allow operation at this power level with this activity level for 48 hours before a unit shutdown is initiated. The 4 hour report distracter is from EAL 11.1 Technical Specifications, that requires the report upon initiation of a unit shutdown directed by Tech Specs, which would happen after 48 hours of operation at this RCS activity level OR if the RCS leak rate was > ONE gpm unidentified leakage. However, EAL 1.1.1.a RCS Activity states that operation at this level for >48 hours requires UE declaration, which would occur before the 4 hour notification. The 1 hour and 8 hour distracters are found throughout the Reportable Action Level section of the ECG. Additionally, if candidate goes to TS 3.7.1.4 for specific activity of SECONDARY coolant by mistake, they will think the level is exceeded and the unit shutdown will have to be done within 6 hours.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem ECG		1.0 Fuel Clad Damage	1	00
Salem Tech Specs		3.4.9, 3.4.7.2, 3.7.1.4		258/262

L.O. Number ABRC02E003

Objectives

Material Required for Examination SRO 7 ECG with CFST Section removed, and Unit 2 Tech Specs 3.4.9 AND 3.7.1.4

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

Question Source Comments Changed from required TS action to first E-plan notification required. Added RCS ULR rise for added complexity.

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic: SRO 8

Given the following conditions:

- Unit 2 was operating at 100% power when a LOCA occurred.
- The crew is now in 2-EOP-LOCA-1, and the STA observes the following conditions:
  - All rods are fully inserted.
  - No RCP's are operating.
  - A total of 10 CETs are reading between 725-750 deg. F.
  - Remaining CET's are reading between 660-690 deg. F.
  - Containment pressure is 24 psig.
  - Containment sump level is 52%.
  - RWST level is 17 ft.
  - All loop Tc's are between 275-290 deg. F.
  - RVLIS Full Range indicates 43%.
  - RCS pressure is 265 psig.
  - Only 2A 4KV Vital Bus is energized.

At this time, which of the following identifies the procedure which must be implemented FIRST?

Reference provided.

a. 2-EOP-FRCC-2, Response to Degraded Core Cooling.

b. 2-EOP-FRCC-1, Response to Inadequate Core Cooling.

c. 2-EOP-FRCE-1, Response to Excessive Containment Pressure.

d. 2-EOP-FRTS-2, Response to Anticipated Pressurized Thermal Shock Conditions.

Answer: a **Exam Level**: S **Cognitive Level**: Application **Facility**: Salem 1 & 2 **ExamDate**: 5/17/2010

KA: 00WE06A202 EA2.2 **RO Value**: 3.5 **SRO Value**: 4.1 **Section**: EPE **RO Group**: 2 **SRO Group**: 2 55.43 ☑

System/Evolution Title: Degraded Core Cooling E06

KA Statement: Ability to determine and interpret the following as they apply to Degraded Core Cooling: Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

Explanation of Answers: 55.43(5) The conditions presented in the stem will result in a PURPLE path being present on the Core Cooling Status tree due to RCS subcooling <0, then no RCPs running, then 5 or more CETs>700 deg., then RVLIS > 39%. The RED path for Core Cooling is not present, so FRCC-1 is incorrect. A PURPLE path will be present on Containment Environment due to containment pressure being between 15-47 psig, but is a lower priority than Core Cooling. The Thermal Shock status tree indicates a PURPLE path will also be present, but is also a lower priority than Core Cooling Purple path. The Thermal Shock Figure 4A curve is provided.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Critical Safety Function Status Trees	2-EOP-CFST-1			25

L.O. Number

FRCC00E005

Objectives

Material Required for Examination	2-EOP-CFST-1 Figure 4A Thermal Shock Limit A Curve (page 71 of 73)

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

Question Source Comments	Vision Q77770 replaced LOPA-1 and LOCA-5 as distracters with FRTS-2 and FRCC-1, and modified stem to have TS Purple path present. Answer remains the same

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic SRO 9

Given the following conditions:

- While operating at 100% power, Unit 2 experiences a large, unisolable steamline rupture affecting ALL Steam Generators.
- The control room crew is responding to the event in the EOP's, and the rupture remains unisolable.
- RCS pressure is 1349 psig and lowering.
- ALL SG WR levels are 20% and lowering.

Which of the following describes an action, and the bases for that action, which will be performed to mitigate the potential adverse consequences of the event?

a. Running RHR pumps will be stopped in LOSC-2, Multiple Steam Generator Depressurization, if RCS pressure is greater than 300 (420 adverse) psig and stable or rising, to prevent potential damage to the RHR pumps due to heat up of the recirculated fluid.

b. AFW flow will be reduced to no less than 1.0E4 lbm/hr in LOSC-1, Loss of Secondary Coolant, to ensure steam generator tubes are kept wet and minimize the possibility of SGTR when the steam generators have depressurized.

c. RCPs will be tripped in LOSC-2 after verifying ECCS flow is established so that CET temperatures do not become superheated if forced circulation in the RCS stops.

d. 23 AFW pump will be stopped if not needed for AFW flow in LOSC-1, to extend the time before all steam generators completely blow down.

Answer a **Exam Level** S **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 00WE12G418 2.4.18 **RO Value:** 3.3 **SRO Value:** 4.0 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43 ☑

System/Evolution Title: Uncontrolled Depressurization of all Steam Generators E12

KA Statement: Knowledge of the specific bases for EOPs.

Explanation of Answers: 55.43(5) C is incorrect because the RCPs are not stopped if a cooldown is in progress. RCP trip criteria specifically asks if a cooldown is in progress, and if it is, does NOT stop the RCPs at step 6 of LOSC-2. A is correct because LOSC-2 Basis Document, page 24 states..."On the RHR system where the pump recirculates on a small volume circuit, there is concern for pump and motor overheating. The RHR HX cooling isolation valve CC16 does not automatically open, so the fluid being recirculated in the RHR system is not being cooled. If it were injecting, the cool water flowing through the pump would be providing cooling. B is correct because it will be done in LOSC-2, not LOSC-1, with the right reason. D is incorrect because while there is a step in LOSC-1 for stopping 23 AFW pump, it comes AFTER the transition out of LOSC-1 to LOSC-2 occurs.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Multiple Steam Generator Depressurization	2-EOP-LOSC-2			26
Loss of Secondary coolant	2-EOP-LOSC-1			23

L.O. Number

LOSC02E004

Objectives

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Significantly Modified **Used During Training Program** ☐

Question Source Comments DC Cook 9/2001 NRC SRO exam

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic: SRO 10

Given the following conditions:

- Unit 2 has experienced a LBLOCA coincident with a loss of off site power.
- 2C 4KV vital bus locked out on bus differential.
- 2B SEC did not actuate.

Assuming one train of ECCS equipment is operating, which of the following identifies the FIRST action which will restore the minimum complement of equipment to assure containment integrity is maintained IAW Salem FSAR?

a. Resetting 2C SEC.

b. Depressing START PB for 21 CFCU.

c. Depressing START PB for 22 AND 24 CFCUs.

d. Rotating key switch to ON for 22 Containment Spray pump.

Answer: c **Exam Level:** S **Cognitive Level:** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 00WE14G107 2.1.7 **RO Value:** 4.4 **SRO Value:** 4.7 **Section:** EPE **RO Group:** 2 **SRO Group:** 2 55.43 ☑

System/Evolution Title: High Containment Pressure E14

KA Statement:

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

Explanation of Answers:

55.43(5,1) FSAR Section 6 and 15 both state that the minimum complement of Containment Spray Pump/CFCUs required to ensure containment integrity along with a train of ECCS in operation is 1 CS pump and 3 CFCUs. With the conditions in the stem, only 21 CS pump will be running on A bus, C bus will be deenergized because a bus differential signal locks out all power to the bus. Additionally, the power supplies to the CFCUs are A,B,C,B,C for 21-25 CFCUs, so only 21 CFCU will be in operation. A is incorrect because the SEC can't start any loads until the bus has power. B is incorrect because it is already running. C is correct because that will restore the 3 CFCUs needed. D is incorrect because C bus has no power.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem UFSAR		6	23,29,32	23,19,18

L.O. Number
CSPRAYE002
CONTMTE002

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: SRO 11

Given the following conditions:

- Unit 1 is performing a Tech Spec required shutdown due to 11 and 12 charging pumps being INOPERABLE.
- The unit is tripped from 20% power.
- Upon entering EOP-TRIP-2, Reactor Trip Response, the following conditions are present:
  - 3 control rods remain full out.
  - PZR level is 8% and lowering.
  - NO AFW pumps are running and the lowest SG NR level is 16%.
  - 1CC131, RCP Thermal Barrier Return Valve has shut.

Which of the following identifies the required actions for these conditions?

a. Initiate rapid boration for 105 minutes while continuing in TRIP-2.

b. Initiate Safety Injection and go to EOP-TRIP-1, Rx Trip or Safety Injection.

c. Either start at least ONE AFW pump or immediately go to FRHS-1, Loss of Secondary Heat Sink.

d. Stop ALL RCPs and transition to EOP-TRIP-4, Natural Circulation Cooldown, when directed to perform cooldown required per Tech Specs.

Answer: b **Exam Level:** S **Cognitive Level:** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 006000A212 A2.12 **RO Value:** 4.5 **SRO Value:** 4.8 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43 ☑

System/Evolution Title: Emergency Core Cooling System 006

KA Statement: Ability to (a) predict the impacts of the following on the Emergency Core Cooling System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation:
Conditions requiring actuation of ECCS

Explanation of Answers: 55.43(5) A is incorrect because while the rapid boration for 105 minutes is directed by TRIP-2, the higher priority condition of PZR level <11% requiring SI initiation and transition to TRIP-1 is present. B is correct because with PZR level <11% and unable to be maintained >11% (which will be the case with only 23 charging pump available, plus letdown is isolated), then initiation of SI and transition to TRIP-1 is required per TRIP-2 CAS. C is incorrect because transition to FRHS-1 is not performed until SG NR level is <9% with no AFW pumps running. D is incorrect because CC131 closing does not isolate all cooling to RCP's, it only isolates the thermal Barrier return flowpath, and as such does not require stopping all RCP's as per CAS of TRIP-2 if all RCP cooling was lost.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Reactor Trip Response	2-EOP-TRIP-2			27

L.O. Number
ECCS00E015
TRP002E008
TRP002E005

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 SRO 12

Given the following conditions:

- Unit 2 is operating at 100% power.
- PZR Pressure Channel I (one) is selected for Control.
- PZR Pressure Channel IV (four) is selected for Alarm.
- A channel calibration of Loop 21 RCS Narrow Range Th and Tc channels is being performed IAW S2.IC-CC.RCP-0001, 2TE-411A-B #21 RX COOLANT LOOP DELTA T-TAVG PROTECTION CHANNEL I.
- All required bistables have been placed in their test positions.

Which of the following describes the result if PZR Pressure Channel IV (four) instrument transmitter loses power, and what action, if any, is required to be performed?

a. A Rx trip will occur on Over Power / Delta T. Operator action will be required to shut PZR Spray valves to prevent Lo PZR Pressure Safety Injection in EOP-TRIP-2, Rx Trip Response.

b. A Main Turbine Runback will occur on Over Temperature / Delta T. Depress GO to backup runback signal on Digital EHC consol IAW S2.OP-AR.ZZ-0012, Control Console CC2.

c. A Rx trip will occur on Over Temperature / Delta T. Perform immediate actions of EOP-TRIP-1, no extra mitigative actions will be required.

d. No plant response other than annunciation of alarms will occur. Verify alarms are consistent with actual plant condition IAW ARPs.

Answer c **Exam Level** S **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 016000A202 A2.02 **RO Value:** 2.9* **SRO Value:** 3.2* **Section:** SYS **RO Group:** 2 **SRO Group:** 2 55.43 ☑

System/Evolution Title: Non-Nuclear Instrumentation System 016

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

Loss of power supply

Explanation of Answers: 55.43(5) Testing the 21 loop Tc and Th instruments will require placing all the bistables associated with that loops temperature in the tripped condition. Operators should be aware that OT/DT and OP/DT runback and Rx trip signal bistables for that channel will be tripped. PZR pressure feeds into the setpoint circuitry for the OT/DT circuitry, and the loss of power to the channel IV PZR pressure instrument will cause its output to go low. This will cause the setpoint for loop 24 to lower below the full power D/T for that loop, causing a SECOND channel of OT/DT to trip its bistable, and makeup the 2/4 loops OT/DT Rx trip. The PZR pressure channel alarm channel does not input to the PZR Master Pressure Controller and will not affect PZR pressure. A is incorrect because the Over Power D/T is based Tavg, and rate of change of Tavg, and is not affected by pressure. B is incorrect, because even if someone says the runback signal would occur first, the action is not correct because there is no backup of the runback in ARP. D is incorrect because of A above.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
2TE-411A-B #21 RX COOLANT LOOP DELTA T	S2.IC-CC.RCP-0001			55
RPS PZR Press and Lvl Control	221060			7
	221051			10

L.O. Number
RCTEMPE007
RCTEMPE008

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: SRO 13

While operating at 100% power during the winter, 21 CFCU high speed breakers trip on over current.

Which of the following identifies the effect this will have, and what action will be taken in response to the CFCU trip?

a. Containment humidity will remain constant. Open 125VDC control power to the high speed AND low speed breakers to ensure 21 CFCU does not start on a valid auto start signal IAW Tech Spec 3.6.2.3, Containment Cooling System.

b. SW flow to the remaining in service CFCUs will rise noticeably. Start a backup CFCU in High Speed IAW S2.OP-SO.CBV-0001, Containment Ventilation Operation to restore normal system configuration.

c. SW flow to the remaining in service CFCU's will remain constant. Start a backup CFCU in Low Speed IAW S2.OP-SO.CBV-0001 to prevent a rise in containment temperature.

d. Containment humidity will rise noticeably. Open 125VDC control power to the high speed breakers to restore operability of 21 CFCU IAW Tech Spec 3.6.2.3

Answer	b	**Exam Level**	S	**Cognitive Level**	Application	**Facility:**	Salem 1 & 2	**ExamDate:**	5/17/2010

KA:	022000A201	A2.01	**RO Value:**	2.5	**SRO Value:**	2.7	**Section:**	SYS	**RO Group:**	1	**SRO Group:**	1	55.43	☑

System/Evolution Title: Containment Cooling System | 022

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

Fan motor over-current

Explanation of Answers: 55.43(5) SW flow will rise due to the removal of 1950 gpm from the system when 21 CFCU trips. The flow to the other CFCUs will rise due to increased SW header pressure. The O/S CFCU will be started to restore normal operating configuration of 4 CFCUs in high speed. Salem removes the 125VDC from the high speed breakers, but that alone does not make the CFCU operable, since the cause of the breaker trip is not known. Containment humidity will rise, but a very small amount, and not noticeably.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Containment Ventilation Operation	S2.OP-SO.CBV-0001			32
Control Console 2CC1	S2.OP-AR.ZZ-0011			56

L.O. Number

CONTMTE007

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 SRO 14

Which of the following identifies how post accident radiation releases from Containment following a LBLOCA are maintained less than that assumed in the Salem UFSAR?

a. Limiting Rx Thermal Power to 3459 MWth to limit amount of fission product buildup.

b. Containment Spray system operation to maintain containment pressure < Test Pressure of 54 psig.

c. Containment Spray system operation to maintain containment pressure < Design Pressure of 47 psig.

d. Limiting allowable fuel defects, and replacement of leaking fuel bundles to maintain the effective ratio of leaking to intact fuel of <10%.

Answer c **Exam Level** S **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 026000G311 2.3.11 **RO Value:** 3.8 **SRO Value:** 4.3 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43 ✔

System/Evolution Title: Containment Spray System 026

KA Statement: Ability to control radiation releases.

Explanation of Answers: 55.43(4) Salem UFSAR, section 6 states that reactor containment ensures that post-accident leakage is limited to a safe rate of 0.1% of the free containment volume per day at the design pressure of 47 psig. Containment spray operation is required to keep containment pressure <47 psig. A is incorrect because limiting thermal power ensures that fuel peaking and hot channel factors are maintained. . B is incorrect because while the containment is tested at 54 psig test pressure, the FSAR states it is the design pressure that is the concern for containment leakage. D is incorrect because the assumption in Section 15 for a DBA is that 1% failed fuel is assumed to be present before onset of accident.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem UFSAR		Section 6	6.2-1 & 6.	6/20

L.O. Number

CONTMTE001

CONTMTE002

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 SRO 15

Given the following conditions:

- Unit 2 is in MODE 5.
- OHA C-35 SFP LO alarms.
- The NEO dispatched to investigate reports SFP level just below the lo alarm setpoint, and appears to be stable.
- No leak identification action has been initiated.

Which of the following describes the actions required for this condition?

a. Occasional SFP low level alarms are to be expected due to the leak on the SFP liner, refill the SFP using preferred source CVCS HUT water if available to maintain boron concentration as high as possible IAW S2.OP-SO.SF-0001.

b. Direct the operator to investigate source of possible leak, and refill the SFP using preferred source demineralized water IAW S2.OP-SO.SF-0001, FILL AND TRANSFER OF THE SPENT FUEL POOL.

c. IMMEDIATELY GO TO S2.OP-AB.FUEL-0002,LOSS OF REFUELING CAVITY OR SPENT FUEL LEVEL, to isolate the SFP cooling pumps individually to isolate the most likely source of leakage.

d. Monitor 2R5 and 2R32 SFP Area Radiation Monitors, which will initiate 22 HEPA PLUS CHAR mode of FHV IAW S2.OP-AB.FUEL-0002.

Answer b **Exam Level** S **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 033000A203 A2.03 **RO Value:** 3.1 **SRO Value:** 3.5 **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:
Abnormal spent fuel pool water level or loss of water level

Explanation of Answers: 55.43(7)(5) B is correct because there is no indication of a leak as per stable SFP level. C is incorrect because with the level just below the setpoint and no leakage indicated, going to AB.FUEL-2 is inappropriate and could cause problems if trying to isolate a phantom leak. A is incorrect since the CVCS HUT is the 3rd preferred source of makeup water to SFP behind demin water and PWST. D is incorrect because the 2R32 does not perform any automatic ventilation function, it stops outward crane movement. Additionally, the known SFP liner leak is on Unit 1, not Unit 2.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Fill and Transfer of the Spent Fuel Pool	S2.OP-SO.SF-0001			18
Overhead Annunciator Window C	S2.OP-AR.ZZ-0003			17

L.O. Number Objectives

SFP000E006

Material Required for Examination

Question Source: Previous 2 NRC Exams **Question Modification Method:** Editorially Modified **Used During Training Program** ☐

Question Source Comments 12/2006 NRC SRO exam Q16

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic SRO 16

While performing actions in 2-EOP-FRCE-1, Response to Excessive Containment Pressure, due a steam rupture in containment, the Step 6 CAUTION states, "AT LEAST ONE SG MUST BE MAINTAINED AVAILABLE FOR RCS COOLDOWN."

Which of the following describes how that caution will be applied to the subsequent steps for SG identification and isolation if ALL SGs are faulted?

a. Choose ONE SG to remain available for RCS cooldown and feed it at a rate which maintains RCS cooldown <100 deg./hr., while isolating all sources of feedwater to the other 3 SG's.

b. Choose ONE SG to remain available for RCS cooldown and feed it between 1.0-5.0E4 lbm/hr, while isolating all sources of feedwater to the other 3 SG's.

c. Feed ALL SG's; minimize feed flow to no less than 1.0E4 lbm/hr total COMBINED flow to the SGs.

d. Feed ALL SG's; minimize feed flow to no less than 1.0E4 lbm/hr to EACH SG.

Answer d **Exam Level** S **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 061000G420 2.4.20 **RO Value:** 3.8 **SRO Value:** 4.3 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43 ✔

System/Evolution Title: Auxiliary / Emergency Feedwater System 061

KA Statement:

Knowledge of operational implications of EOP warnings, cautions, and notes.

Explanation of Answers:

55.43(5) D is correct because the CAS following the CAUTION specifically says if ALL SGs are faulted then minimize feed to each SG to NLT 1.0 E4 lbm/hr. This is NOT step memorization, because the operator should know that with ALL SGs faulted, ALL SGs need to be fed at the minimum verifiable feed flow to keep the tubes wet. This prevents a situation where SG' are allowed to dry out, then subsequent feed is initiated and creates significant thermal stresses on the SG components. A and B are incorrect because of the need to keep flow established to ALL SGs. They are plausible if the operator thinks the CAUTION overrides any steps dealing with ALL SGs being faulted. The 100 deg/hr cooldown rate limit is found in numerous places in the EOP network, and is the entry condition for FRTS-1. The 1-5E4 lb/hr is found in FRHS-1 when feed has been restored and certain WR level is established. C is incorrect because 1.0 E4 is the minimum verifiable feed flow to each SG.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Response to Excessive Containment Pressure	2-EOP-FRCE-1			22

L.O. Number

FRCE00E006

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 SRO 17

Given the following conditions:

- 2C EDG is completing a loaded run IAW S2.OP-ST.DG-0003, 2C EDG Surveillance Test.
- The NEO performing the unloading has reduced electrical load to 500 KW, 250 KVAR (out).
- The NEO announces the next action he is performing is lowering load to 0 KW and opening the EDG output breaker.
- Which of the following identifies any potential concerns associated with this action, and as the Field Supervisor, how should you respond?

a. Reactive loading must also be reduced to 0 KVAR or the large arc across the breaker contacts when it is opened leads to reduced breaker life. Ensure NEO also performs this reactive load reduction.

b. The EDG voltage regulator will automatically respond to raise voltage as speed is reduced. Ensure NEO lowers voltage to prevent over-excitation trip of EDG.

c. The EDG may overspeed when the output breaker is tripped. Immediately stop the NEO from reducing load.

d. The EDG breaker may trip on reverse power. Immediately stop the NEO from reducing load.

Answer	d	**Exam Level**	S	**Cognitive Level**	Application	**Facility:**	Salem 1 & 2	**ExamDate:**	5/17/2010

KA:	064000A204	A2.04	**RO Value:**	2.7	**SRO Value:**	3.0	**Section:**	SYS	**RO Group:**	1	**SRO Group:**	1	55.43 ☑

System/Evolution Title: Emergency Diesel Generators 064

KA Statement: Ability to (a) predict the impacts of the following on the Emergency Diesel Generators and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation:
Unloading prior to securing an ED/G

Explanation of Answers: 55.43(5) D is correct because load must remain >200 KW to prevent tripping the EDG breaker on reverse power. A is incorrect because reactive loading is reduced to a level > 0 (50-100KVAR OUT) to prevent having the EDG become a load on the system prior to opening the output breaker. B is incorrect because lowering speed will not affect voltage to the point where a substantial increase in EDG field current would occur. C is incorrect because of A above, and with load at zero, there is no change in load when the output breaker is opened which would cause EDG speed to change.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
2C EDG Surveillance Test	S2.OP-ST.DG-0003			48

L.O. Number
EDG000E012

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 SRO 18

Given the following conditions:

- Unit 1 is shutdown during a refueling outage.
- A normal release of 14 Waste Gas Decay Tank to the plant vent is scheduled to be performed on day shift IAW S1.OP-SO.WG-0011, Discharge of 14 Gas Decay Tank to Plant Vent.

When reviewing the schedule, which of the following activities is allowed to be scheduled during the period 14 WGDT is being released?

a. Release of 11 WGDT.

b. Initiation of Unit 1 VCT purge.

c. Transfer of gas between 12 and 13 WGDTs.

d. Aligning Unit 2 Vent Header to Unit 1 Waste Gas Compressor suction.

Answer	b	**Exam Level**	S	**Cognitive Level**	Memory	**Facility:**	Salem 1 & 2	**ExamDate:**	5/17/2010

KA:	071000G218	2.2.18	**RO Value:**	2.6	**SRO Value:**	3.9	**Section:**	SYS	**RO Group:**	2	**SRO Group:**	2	55.43 ☑

System/Evolution Title: Waste Gas Disposal System 071

KA Statement:

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

Explanation of Answers:

55.43(4) A is incorrect because only a single WGDT is allowed to be released at a time. B is correct because the release procedure specifically allows a VCT purge to plant vent to occur during the WGDT release. C is incorrect because the release procedure specifically disallows transfer of gas between tanks when another tank is being released. D is incorrect because while waste LIQUID can be transferred from one unit to the other, waste GAS cannot.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Discharge of 14 Gas Decay Tank To Plant Vent	S1.OP-SO.WG-0011			31
Transfer of Waste Gas	S1.OP-SO.WG-0007			7

L.O. Number
WASGASE011

Objectives

Material Required for Examination

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

Question Source Comments

Vision 78151 modified from "choose all that are allowed" to choose one which is allowed per schedule

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic SRO 19

The control room operators are currently responding to an accident, which has required implementation of the EOPs. They have recently made a REQUIRED transition to a Purple Path Functional Restoration Procedure (FRP). While performing steps of this procedure, a condition arises which is covered by an action contained in the Continuous Action Summary (CAS) of the EOP that was in effect.

Which of the following identifies the correct course of action to be taken IAW OP-AA-101-111-1003, Use of Procedures?

a. Continue actions in the FRP until it is exited. Do NOT perform EOP CAS action until EOP is the procedure in effect.

b. Perform the EOP CAS action as soon as it is identified ONLY if it does not conflict with or reverse any action being taken in the FRP.

c. Continue actions in the FRP until it is exited. ONLY perform the EOP CAS action if it is also contained in the CAS section of the FRP.

d. Perform the EOP CAS action as soon as it is identified since CAS actions remain in effect from the point the EOP is entered until the EOP has been completed.

Answer a **Exam Level** S **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 194001G120 2.1.20 **RO Value:** 4.6 **SRO Value:** 4.6 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43 ☑

System/Evolution Title: GENERI

KA Statement: Ability to interpret and execute procedure steps.

Explanation of Answers: 55.43(5) A is correct because once a FRP is entered, it is performed until completion OR transition to a higher priority FRP. C is incorrect because FRPs do not have CAS's. B and D are incorrect because CAS actions from EOPs are NOT in effect in FRPs unless it is a YELLOW priority FRP.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Use of Procedures	OP-AA-101-111-1003			1

L.O. Number | Objectives

TRP001E007

TRP001E010

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 SRO 20

Given the following conditions:

- Unit 2 is performing a cooldown IAW S2.OP-IO.ZZ-0006, Hot Standby to Cold Shutdown.
- The unit has entered MODE 5, and the cooldown rate has been lowered to 45 deg/hr.
- PZR temperature is 400 deg F.
- The board NCO reports that PZR hot calibrated level on all 3 channels indicates 40% and is stable.

Which of the following identifies what the Cold Calibrated channel will be reading, and how charging flow should operated?

Reference provided.

a. 30%. Raise charging flow.

b. 30%. Maintain charging flow stable.

c. 35%. Raise charging flow.

d. 35%. Maintain charging flow stable.

Answer a **Exam Level** S **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 194001G125 2.1.25 **RO Value:** 3.9 **SRO Value:** 4.2 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43 ☑

System/Evolution Title: GENERI

KA Statement: Ability to interpret reference materials, such as graphs, curves, tables, etc.

Explanation of Answers: 55.43(5)Using Exhibit 1 of IOP-6, page 2, shows that with hot cal level at 40% at 400 deg., the ACTUAL level in PZR is between 34-35%. Using Page 1 and the ACTUAL PZR level of 35% and going across to the 400 deg line, cold cal level will be ~29-30%. After the cooldown rate has been reduced as per stem, IOP-6 has operators raise charging flow to establish 80% cold cal level. The distracters either have the incorrect level or maintain stable charging flow. Salem experienced a PZR drain-down event in 2008 due to less than adequate procedural direction and operator understanding of the hot cal/cold cal correlation in PZR level, and heightened emphasis on this relationship and better procedure direction has been applied.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Hot Standby to Cold Shutdown	S2.OP-IO.ZZ-0006			40

L.O. Number | Objectives

IOP006E009

PZRP&LE008

Material Required for Examination SRO 20 S2.OP-IO.ZZ-0006 Rev. 40

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 SRO 21

Given the following conditions:

Unit 2 is performing a reactor startup by control rods IAW S2.OP-IO.ZZ-0003, Hot Standby to Minimum Load.
Estimated Critical Conditions are:
- Cb= 500 ppm
- Control Bank D = 121 steps
- Xe free
- 12,000 EFPH

When the ICRR value reaches 0.125, the Predicted Critical Rod Height is 67 steps.

What action(s), if any, are required to be taken in response to this Predicted Critical Rod Height?

References provided.

a. Continue the reactor startup, and evaluate the post startup data for trend.

b. Initiate rapid boration, insert Control Rod Banks, and recalculate the ECC.

c. Insert the Control Rod Banks and recalculate the ECC prior to withdrawing Control Rods.

d. Obtain Reactor Engineer and Operations Manager approval prior to continuing with the startup.

Answer a **Exam Level** S **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 194001G201 2.2.1 **RO Value:** 4.5 **SRO Value:** 4.4 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43 ☑

System/Evolution Title: GENERI

KA Statement:

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

Explanation of Answers:

55.43(6) Using Table 1-8, page 5 of 5 for EOL HZP, the estimated (ECC) rod height of 121 steps leaves an integral rod worth remaining of 894.3 pcm. The ICRR plot predicted critical rod height of 67 steps leaves an integral rod worth of 1240.8 pcm using the following data: The IRW difference between 61 steps (1329.5) and 76 steps (1108.5) is 221 pcm. The average pcm per step in this range is 14.7 pcm. 14.7 pcm x 9 steps between 76 and 61 = 132.3 pcm. Add this to the 76 step worth of 1108.5 and the result is the IRW left at 67 steps is 1240.8. The predicted rod height of 121 IRW is 894.3, so the difference in predicted critical rod heights (121 vs 67 steps) is 346.5 pcm. Step 5.3.16 states that if the difference between the Estimated Critical Rod Position (ECC) and the Predicted Critical Rod Position (ICRR) differs by >300 pcm but <400 pcm, then continue the startup and evaluate the post startup data for trend. The distracters are other actions required when the difference is >400 but <500, >500 but <1000, and if predicted is below the RIL. With Bank D at 67 steps and a 128 step withdrawal separation between banks, Control Bank C will be at 195 steps, above the RIL limit of 58 steps at 0% power.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Hot Standby to Minimum Load	S2.OP-IO.ZZ-0003		25-26	31
Curve Book	S2.RE-RA.ZZ-0016			4

L.O. Number
ECP000E011

Objectives

Material Required for Examination	SRO 21 S2.RE-RA.ZZ-0016 Rev. 4 Salem Unit 2 Cycle 18 COLR Rev. 2 S2.OP-IO.ZZ-0003 Rev. 31

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

Question Source Comments	Vision 84016 modified stem conditions to change correct answer to a previous distracter, updated for current curve book rev and format. Replaced one distracter.

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic SRO 22

Which of the following describes the bases for maintaining an OPERABLE Auxiliary Feedwater System in Modes 1-3 IAW Tech Spec 3.7.1.2?

a. Ensures the capability to cooldown and maintain the RCS at <500 °F for 8 hours following a SGTR assuming failed fuel.

b. Remove decay heat and maintain the RCS at HSB conditions for 24 hours following a complete loss of off-site power.

c. Ensures that the RCS can be cooled down to <350 deg F from normal conditions following a complete loss of off-site power.

d. Provide the RCS heat removal capability necessary to prevent a challenge to the pressurizer safety valves during a full power ATWT.

Answer c **Exam Level** S **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 194001G225 2.2.25 **RO Value:** 3.2 **SRO Value:** 4.2 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43 ☑

System/Evolution Title: GENERI

KA Statement:

Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.

Explanation of Answers: 55.43(2) All of the distracters are incorrect because the Tech Spec Bases document does not contain those reasons. Additionally: B is plausible because the operability of the AFWST is for 8 hours maintaining HSB with steam discharge to the atmosphere. A is plausible because the RCS cooldown during a SGTR to <500 degrees is to limit the potential off-site dose. C is correct per Bases. D is plausible because the ATWT bases document for AFW flow is for decay heat removal.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem Tech Specs Bases		3.7.1.2	B3/4 7-2	258

L.O. Number Objectives

AFW000E011

Material Required for Examination

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

Question Source Comments Vision 60263

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic SRO 23

Mr. Doe is a Hope Creek Station employee and has received 1900 mrem routine TEDE for the current calendar year, ALL dose recorded at Hope Creek Station. He is expected to receive an additional dose of 450 mrem on his current job assignment AT SALEM.

His lifetime exposure is 5500 mrem.

IAW RP-AA-203, Exposure Control and Authorization, and prior to performing the job, written approval for increasing his dose limit to 3000 mrem TEDE for the calendar year must be received from the work group supervisor and the ...

a. Station Manager and Site Vice President.

b. RP Manager and Station Manager.

c. Site Vice president ONLY.

d. RP Manager ONLY.

Answer d **Exam Level** S **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 194001G304 2.3.4 **RO Value:** 3.2 **SRO Value:** 3.7 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43 ☑

System/Evolution Title: GENERI

KA Statement: Knowledge of radiation exposure limits under normal or emergency conditions.

Explanation of Answers: 55.43(4) D is correct because the approval requirements are: Up to 3,000 mrem- RP Manager; up to 4,000 mrem- RP Manager and Station Manager, >4,000 Site Vice President. Distracters are all some form of combo of each of the positions.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Exposure Control and Authorization	RP-AA-203			4

L.O. Number
RADCONE002

Objectives

Material Required for Examination

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

Question Source Comments Vision Q65481, changed a distracter from Station Manager ONLY to Site Vice President only to make more plausible.

Comment

RO SkyScraper | SRO Skyscraper | RO System/Evolution List | SRO System/Evolution List | Outline Changes

Question Topic: SRO 24

An explosion and fire at the RAP tank area has resulted in a possible large spill of radioactive water in the area. An Alert has been declared and all required facilities are activated and staffed. The Fire Department has determined that off-site assistance from the local fire department is needed.

IAW S2.OP-AB.FIRE-0001, Control Room Fire Response, which choice identifies who must authorize requesting off-site fire department assistance?

a. Security Duty Supervisor.

b. Nuclear Fire Protection Supervisor.

c. Radiological Assessment Coordinator (RAC).

d. Shift Manager / Emergency Duty Officer (EDO).

Answer d **Exam Level** S **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 194001G427 2.4.27 **RO Value:** 3.4 **SRO Value:** 3.9 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43 ☑

System/Evolution Title: GENERI

KA Statement: Knowledge of "fire in the plant" procedures.

Explanation of Answers: 55.43(5) CAS ATT. 1, Fire Dept. Support, Caution prior to step 3.0 in AB.FIRE-1 states, "In the event of a radiological emergency, the Nuclear Fire Protection Supervisor should obtain permission from the EDO/SM prior to calling for off-site assistance." A is plausible because security is required to be notified whenever off-site assistance is requested (CAS 2.0) C is plausible because they will be leading the fire brigade and will be the person to request the off-site assistance through the EDO. D is plausible because during an Emergency the RAC is associated with the radiological aspect of the emergency.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Control Room Fire Response	S2.OP-AB.FIRE-0001			7

L.O. Number | Objectives

FIRPROE012

Material Required for Examination

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

Question Source Comments Vision Q78204

Comment

Question Topic SRO 25

With Salem Unit 2 operating at 100% power, which of the following conditions will require operator performance of the designated Immediate Action steps IAW the associated procedure?

a. An auto Safety Injection signal does NOT trip the Rx. Initiate SI IAW 2-EOP-FRSM-1, Response to Nuclear Power Generation.

b. A PZR Spray valve fails open. Place the affected spray valve in manual IAW S2.OP-AB.PZR-0001, Pressurizer Pressure Malfunction.

c. 2A Vital Instrument Bus becomes deenergized. Place Rod Control in manual IAW S2.OP-AB.115-0001, Loss of 2A 115V Vital Instrument Bus.

d. The Electric System Operator calls the control room and reports a valid SMD of K-6 and ESOC EXCESS MVAR ALARM. Depress SMD #1 RUNBACK IAW S2.OP-AB.GRID-0001, Abnormal Grid.

Answer c **Exam Level** S **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 5/17/2010

KA: 194001G449 2.4.49 **RO Value:** 4.6 **SRO Value:** 4.4 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43 ☑

System/Evolution Title: GENERI

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

Explanation of Answers:
55.43(5) A is incorrect because if the Rx does not trip, it will either be tripped by alternate means in TRIP-1, after which the SI would be manually backed up, or if the Rx continued to fail to be tripped, FRSM-1 would be entered, but initiating SI is NOT an immediate action. B is incorrect because it is not an immediate action. C is correct because loss of 2A VIB causes uncontrolled rod insertion and immediate action is to place rods in manual. D is incorrect because performing the SMD runback is not an immediate action BUT it used to be in previous revisions of AB.GRID.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of 2A 115V Vital Instrument Bus	S2.OP-AB.115-0001			20
Abnormal Grid	S2.OP-AB.GRID-0001			16
Pressurizer Pressure Malfunction	S2.OP-AB.PZR-0001			18

L.O. Number
AB1151E002

Objectives

Material Required for Examination

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

Question Source Comments Additional references TRIP-1 Sh 1 and FRSM-1 Sh 1

Comment