U.S. Nuclear Regulatory Commission
Site-Specific
Written Examination

KEY

Applicant Information

Name:	Region: I
Date: 12/3/2012	Facility: Salem 1 & 2
License Level: RO	Reactor Type: W
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected SIX hours after the examination starts.

Applicant Certification

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

____
Applicant's Signature

Results

Examination Value	________ Points
Applicant's Score	________ Points
Applicant's Grade	________ Percent

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

Question Topic: RO 1

Given the following conditions:

- Unit 2 is at 30% power.
- Control Bank D rod 2D3 drops fully into the core.
- The reactor does not trip.
- The crew is performing actions to recover the rod IAW S2.OP-AB.ROD-0002, Dropped Rod.

Which of the following is/are EXPECTED to alarm during the control rod recovery, and when?

a. OHA's E-8 RIL LO and E-16 RIL LO LO. These occur when the P/A Converter is reset to zero prior to withdrawing the dropped rod.

b. OHA's E-8 RIL LO and E-16 RIL LO LO. These occur when the STARTUP PB is depressed to reset the Rod Step Counter for Control Bank D.

c. OHA E-40 ROD BANK URGENT FAIL. This occurs when the Rod Bank Selector Switch is moved past the AUTO position into the Individual Bank Select position for Control Bank D.

d. OHA E-40 ROD BANK URGENT FAIL. This occurs when withdrawing the dropped rod after the CRDM lift coil switches for all the unaffected rods in that bank have been opened.

Answer: d | **Exam Level**: R | **Cognitive Level**: Application | **Facility**: Salem 1 & 2 | **ExamDate**: 12/3/2012

KA: 000003K205 | AK2.05 | **RO Value**: 2.5 | **SRO Value**: 2.8 | **Section**: EPE | **RO Group**: 2 | **SRO Group**: 2 | 55.43

System/Evolution Title: Dropped Control Rod | 003

KA Statement: Knowledge of the interrelations between Dropped Control Rod and the following:
Control rod drive power supplies and logic circuits

Explanation of Answers: 55.41.b(6) A is incorrect because the P/A converter is only reset (and would cause the alarms) for a GROUP 1 rod recovery, and the affected rod is 2D3 (Group 2). B is incorrect because the STARTUP PB is not depressed during a rod recovery, only when performing a startup. C is incorrect because control rod movement when passing through auto is a concern, and the alarm would not occur then. D is correct because a Power Cabinet Regulation failure occurs when the rod movement demand signal is sent out to Control Bank D rods and only one rod responds with movement.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Dropped Rod	S2.OP-AB.ROD-0002			10
Rod Control Lesson Plan	NOS05RODS00-11			11

L.O. Number: ABROD2E003

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 1 has performed a manual Rx trip from 100% power.
- No SI was required.
- 11 SG NR level is 9.1% and rising slowly
- 12-14 SG NR levels are 8.9% and rising slowly.
- Total AFW flow is 24E4 lbm/hr.

Which of the following describes what AFW flow is required for decay heat removal?

a. At least 22E4 lbm/hr must be maintained until ALL SG NR levels are at least 9%.

b. At least 22E4 lbm/hr must be maintained until at least one SG NR level is at least 15%.

c. AFW flow may be reduced to less than 22E4 lbm/hr to isolate the SG tube leak indicated on 11 SG.

d. AFW flow may be reduced to less than 22E4 lbm/hr because the secondary heat sink requirement is met.

Answer d **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 000007K106 EK1.06 **RO Value:** 3.7 **SRO Value:** 4.1 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Reactor Trip 007

KA Statement: Knowledge of the operational implications of the following concepts as they apply to Reactor Trip:
Relationship of emergency feedwater flow to S/G and decay heat removal following reactor trip

Explanation of Answers: 55.41.b(4) At step 3 of TRIP-2, Reactor Trip Response, operators are asked if total AFW flow is >22E4 lbm/hr. The bases document states that this amount of flow is…"the minimum safeguards AFW flow requirement for heat removal plus allowances for normal channel accuracy (typically one AFW pump capacity at design pressure.)" The one SG with >9% NR level satisfies the Heat Sink Functional Recovery entry which requires either 22E4 lbm/hr flow OR SG NR level >9%. TRIP-2 states to maintain >22E4 lbm/hr until at least one SG NR level is > 9%, then maintain 9-33%

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Reactor Trip Response	2-EOP-TRIP-2	Bases document	11	28

L.O. Number | **Objectives**

TRP002E006

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 2 is operating at 100% power when a catastrophic failure of RCS loop 21 cold leg piping occurs.
- RCS pressure rapidly dropped to 35 psig.
- 22 RHR pump failed to start, and remains stopped.
- Initial RWST level was 41.1 feet.

Of the following, which is CLOSEST to the time available from the failure until the swap to Cold Leg recirc will be required?

a. 13 minutes.

b. 19 minutes.

c. 24 minutes.

d. 33 minutes.

Answer	b	**Exam Level**	R	**Cognitive Level**	Application	**Facility:**	Salem 1 & 2	**ExamDate:**	12/3/2012

KA:	000011K202	EK2.02	**RO Value:**	2.6*	**SRO Value:**	2.7*	**Section:**	EPE	**RO Group:**	1	**SRO Group:**	1	55.43

System/Evolution Title Large Break LOCA 011

KA Statement: Knowledge of the interrelations between Large Break LOCA and the following:
Pumps

Explanation of Answers: 55.41.b(8) Question stem describes LBLOCA with power. With the RCS at 35 psig, all ECCS pumps will be injecting at their maximum rate. The flow rates used are: Charging pumps 2x560= 1120gpm(page 23); SI pumps 2x675= 1350gpm (page 26); RHR 1x4500= 4500 (page 34); and Containment Spray pump flow of 2x2600=5200. (page 17) So, 1120+1350+4500+5200= 12,170 gpm total. With the initial RWST level of 41.1' equating to 370,000 gallons, and 15.2' level of 150,000, you need to pump in 220,000 gallons. That's 18.08 minutes. Distracter A is if the failed RHR pump is included. Distracter D is the time it would take to pump in the entire RWST volume. Distracter C is the time if CS pump flow is not included.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Tank Capacity Data	S2.OP-TM.ZZ-0002			8
ECCS Lesson Plan	NOS05ECCS00-07		23,26,34	7
Containment Spray Lesson Plan	NOS05CSPRAY-04		17	4

L.O. Number

LOCA01E003

Objectives

Material Required for Examination RO 3 S2.OP-TM.ZZ-0002, Tank Capacity Data, Page 28 of 34, RWST Tank Capacity

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

Question Source Comments Vision Q48704. Modified correct answer from 18 to 19 minutes to reduce probability of candidate not choosing correct answer because it was LESS than calculated time. Also modified stem to say what is the CLOSEST time.

Comment

Pump flows used in calculations are runout flows, which would be present during LBLOCA with con

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Question Topic RO 4

Given the following conditions:

- Unit 2 is operating at 30% power, steady state.
- OHA D-29, 22 RCP BKR OPEN/FLO LO is received.
- All 22 loop RC flows are 85% and dropping.
- The red START bezel for 22 RCP is illuminated.
- The reactor has NOT tripped.

Which of the following identifies what has occurred?

a. An ATWT.

b. 22 RCP shaft has seized.

c. 22 RCP shaft has sheared.

d. The 22RC9, RC FLOW common low press tap isolation valve has developed a leak.

Answer c **Exam Level** R **Cognitive Level** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 000015K210 AK2.10 **RO Value:** 2.8* **SRO Value:** 2.8 **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 indicators and controls

Explanation of Answers: 55.41.b(3,7) With a RCP shaft shear, there is no event that would cause the RCP breaker to open. For this reason, that is why the START bezel will still be illuminated, even though loop flows are all dropping. Distracter A is incorrect because between 10%(P-10) and 36%(P-8), 1/4 RCS loop lo flow will NOT cause a Rx trip, the coincidence is 2/4. Distracter D is incorrect because there are 3 low pressure flow taps, and 1 common high pressure flow tap. Distracter B is incorrect because a seized RCP shaft would cause its supply breaker to trip on overcurrent. The indication in the stem is that the breaker is closed. C is correct, because a sheared shaft would cause that loop flow to drop, even while the bezel indication showed the breaker is still closed.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Overhead Annunciators Window D	S2.OP-AR.ZZ-0004			23

L.O. Number Objectives

RCPUMPE008

RCPUMPE009

Material Required for Examination

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

Question Source Comments Vision Q70312 last NRC Exam usage 4 exams ago (12/2006)

Comment

09-01 CERT RO Exam

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.
- 13 Charging pump is in service.
- Normal letdown is in service.
- The 1A 4KV to 460V bus feeder breaker opens, deenergizing the 1A 460/230V bus.

With NO operator action, which of the following identifies a consequence, if any, of this event?

a. PZR level will remain stable.

b. VCT level will be rising at ~ 1% per minute.

c. PZR level will be lowering at ~ 1% per minute.

d. VCT level will be lowering at ~ 4% per minute.

Answer	c	**Exam Level**	R	**Cognitive Level**	Application	**Facility:**	Salem 1 & 2	**ExamDate:**	12/3/2012

KA:	000022K103	AK1.03	**RO Value:**	3.0	**SRO Value:**	3.4	**Section:**	EPE	**RO Group:**	1	**SRO Group:**	1	55.43	☐

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

KA Statement: Knowledge of the operational implications of the following concepts as they apply to Loss of Reactor Coolant Makeup: Relationship between charging flow and PZR level

Explanation of Answers: 55.41.b(7) Normal power operation has the Positive Displacement charging pump in service (13), which is powered from 1A 460 volt bus. The two centrifugal charging pumps, (11 and 12) are powered from B and C 4KV buses respectively. The thumbrule for PZR level at NOT is 75 gallons per % of level.(Page 15 of Lesson Plan) When the 1A 460 volt bus is deenergized, the breaker for the 13 charging pump does NOT trip, it does NOT have a UV trip. Therefore, the interlock for automatically closing the 3 letdown orifice isolation valves is not satisfied (all 3 charging pump breakers open.) Letdown remains in service at 75 gpm, which is normal at power letdown flow. This will cause PZR level to lower at 1% per minute. PZR level would remain stable if it is thought that a charging pump remains in operation because of not knowing correct power supplies. The VCT rule of thumb is 20 gallons per % level. With letdown flow still entering the VCT at 75 gpm and no charging pump taking suction and pumping from VCT, VCT level will be RISING at ~4% per minute, not lowering. The 1% VCT distracter is if there is confusion about which (VCT or PZR) will be changing at 1% per minute.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Charging	S1.OP-AB.CVC-0001			
Pressurizer and PRT Lesson Plan	NOS05PZRPRT06			6

L.O. Number
ABCVC1E001

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 6

Given the following conditions:

- Unit ~~1~~ 2 initiates a Safety Injection from 100% power due to a LOCA.
- 15 minutes after the SI is initiated, containment pressure peaks at 5 psig.

Which of the following identifies an automatic response which has occurred for Component Cooling Water System components, and why?

a. 2CC215 and 2CC113, Excess Letdown Heat Exchanger CCW isolation valves, received a close signal to ensure this non-essential containment flow path is isolated.

b. 21 and 22CC16, RHR HX CCW isolation valves, received an open signal to ensure that long term cooling of the RCS is in service when the swap to Cold Leg Recirc is required.

c. 2CC215 and 2CC113, Excess Letdown Heat Exchanger CCW isolation valves, received a close signal to ensure ALL CCW supply and return from the containment is isolated.

d. 21 and 22CC16, RHR HX CCW isolation valves, received an open signal to ensure that RHR pumps do not overheat if the RCS remains above the shutoff head of the RHR pumps.

Answer	a	**Exam Level**	R	**Cognitive Level**	Memory	**Facility:**	Salem 1 & 2	**ExamDate:**	12/3/2012

KA:	000026K302	AK3.02	**RO Value:**	3.6	**SRO Value:**	3.9	**Section:**	EPE	**RO Group:**	1	**SRO Group:**	1	55.43	☐

System/Evolution Title: Loss of Component Cooling Water | 026

KA Statement: Knowledge of the reasons for the following responses as they apply to Loss of Component Cooling Water:
The automatic actions (alignments) within the CCWS resulting from the actuation of the ESFAS

Explanation of Answers: 55.41.b(7,8) The SI signal sends a close signal to the CC215 and CC113, Excess Letdown HX isolation valves, as they are Containment Phase A isolation valves. The purpose of closing Phase A isolation valves is to ensure all non-essential containment penetrations are isolated on a SI. B is incorrect because CC16s do not receive an open signal until the ARM PB is depressed and the RWST level is 15.2' and manual alignment is required to place ECCS in CLR. C is incorrect because ALL CCW supply and return are not isolated on a SI signal, the RCP CCW is still being supplied until a Phase B signal at 15 psig in cont. D is incorrect because the CC16s do not receive an open signal until the ARM PB is depressed and the RWST level is 15.2', and the RHR pumps are cooled by either flow through the pump from RWST (LBLOCA) or recirc flow (SBLOCA until pp is S/D).

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Component Cooling Lesson Plan	NOS05CCW000-07		40	7

L.O. Number
CCW000E004

Objectives

Material Required for Examination:

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

Question Source Comments: Vision Q42744, made 2 and 2 and added why to stem.

Comment

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

Question Topic RO 7

Salem Unit 1 is operating at 100% power when the PZR Master Pressure Controller demand fails high.

How will this failure affect PZR pressure control components in AUTO?

PZR B/U heaters will be _____. BOTH PZR PORV's will be _____.

a. on. open.

b. on. shut.

c. off. open.

d. off. shut.

Answer	d	**Exam Level**	R	**Cognitive Level**	Application	**Facility:**	Salem 1 & 2	**ExamDate:**	12/3/2012

KA:	000027A101	AA1.01	**RO Value:**	4.0	**SRO Value:**	3.9	**Section:**	EPE	**RO Group:**	1	**SRO Group:**	1	55.43

System/Evolution Title Pressurizer Pressure Control Malfunction 027

KA Statement: Ability to operate and / or monitor the following as they apply to Pressurizer Pressure Control Malfunction:
PZR heaters, sprays, and PORVs

Explanation of Answers: 55.41.b(7) Master Pressure controller scale runs from 0-100% demand. With MPC demand failing high, the output of the MPC calls for maximum spray, and no backup heaters. The PZR PORVs are controlled independently of the MPC demand from actual PZR pressure channels 1-4. Since actual PZR pressure is not high, PORVs have no open demand signal.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Pressurizer Pressure and Level Control	221060			7
Pressurizer Power Relief Valves	231357			14

L.O. Number
ABPZR1E001

Objectives

Material Required for Examination

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

Question Source Comments Vision Q50570. Changed from MPC failing low to failing high, which changes correct answer to one of the distracters.

Comment

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

Question Topic RO 8

Given the following conditions:

- Unit 1 experienced an ATWT in MODE 1 where both Train "A" and "B" Reactor Trip Breakers (RTBs) failed to open.
- The reactor was tripped when the pressurizer heater buses were deenergized.
- The RTBs remain shut.
- An momentary inadvertent safety injection signal was generated and has cleared.

Which of the following describes the impact of depressing the Train A and Train B RESET SI pushbuttons on 2CC1 when performing Safeguards Reset Actions?

The SI signal will…

a. reset, and Auto SI will be blocked.

b. reset, and Auto SI will NOT be blocked.

c. NOT reset, and Auto SI will be blocked.

d. NOT reset, and Auto SI will NOT be blocked.

Answer: b **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 000029K206 AK2.06 **RO Value:** 2.9* **SRO Value:** 3.1* **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Anticipated Transient Without Scram 029

KA Statement: Knowledge of the interrelations between Anticipated Transient Without Scram and the following:
Breakers, relays, and disconnects

Explanation of Answers: 55.41.b(7) The SI signal can be reset as shown on 221057 grid F-2 AND box and downstream LATCH-RESET. This shows the SI can be reset if 2 conditions are present. 1. Manually pushing the reset pb, (MANUAL SI RESET AND BLOCK), and the 1-2 minute TD has timed out after the SI signal was generated. 2. The LATCH-RESET button is reset. Right next to that AND box is another AND box, whose purpose is to block a second SI after the Rx has been tripped. Since the Rx has not tripped, there is no output from this AND box, and a NO signal will be input into the NOR box to the right of it. The 0 signal into this box will produce a 1 signal out of this box, which is one of 2 inputs to the AND box to its right. This AND box needs 2 signals to produce an output (Auto SI). The second input into this AND box is a safety injection from any of the 4 auto SI signals above it. Hi Steamline Flow with lo steamline pressure or lo-lo Tavg, High Steamline Differential pressure, PZR low pressure, or Containment hi pressure.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
RPS Safeguards Actuation Signals	221057			22

L.O. Number
RXPROTE027

Objectives

Material Required for Examination	

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

Question Source Comments	Vision Q44139. Modified inadvertent SI signal from remaining present to being clear This changes correct answer to one of the distracters.

Comment

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

Question Topic RO 9

Given the following conditions:

- Unit 2 will be performing a controlled shutdown and cooldown from 100% power due to a 5 gpm tube leak on 22 SG IAW S2.OP-AB.SG-0001, Steam Generator Tube Leak.
- After completing the Immediate Actions of EOP-TRIP-1, Reactor Trip or Safety Injection, following the Rx trip, the RO reports that control rod 2D2 is stuck in the fully withdrawn position.

Which of the following identifies the action, if any, the crew will perform in response to the stuck rod?

a. Initiate a rapid boration for 35 minutes during performance of EOP-TRIP-2.

b. Initiate a rapid boration for 35 minutes in S2.OP-AB.SG-0001 after exiting the TRIP series procedures.

c. No actions are required for a single stuck rod because SDM for the cooldown to 503 degrees is adequate.

d. No actions are required for a single stuck rod until the Auto SI Block is performed during RCS depressurization to 1900 psig.

Answer	b	Exam Level	R	Cognitive Level	Application	Facility:	Salem 1 & 2	ExamDate:	12/3/2012

KA:	000038G408	2.4.8	RO Value:	3.8	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 how abnormal operating procedures are used in conjunction with EOPs.

Explanation of Answers: 55.41.b(10) Step 3.26.H in AB.SG states to trip the turbine, then trip the Rx at 20% power during the shutdown. The 5 gpm size of the leak will allow for a controlled shutdown, and will also allow the crew to transition to TRIP-2. There are no SGTR diagnostic steps in TRIP-2 that would cause a transition to SGTR-1. AB.SG would be re-entered at step 3.27 following exit of TRIP-2, and 3.28 directs rapid boration for each stuck rod for 35 minutes. The rapid boration will be initiated before any depressurization starts in 3.29, so the distracter regarding depressurization is incorrect.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Steam Generator Tube Leak	S2.OP-AB.SG-0001		22	28
Reactor Trip Response	2-EOP-TRIP-2			28

L.O. Number

ABSG01E005

Objectives

Material Required for Examination

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

Question Source Comments Vision Q85037

Comment

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 operating at 100% power, MOL.
- The Condensate Polisher is in service -full flow.
- 21 SGFP trips.
- The CRS enters S2.OP-AB.CN-0001, Main Feedwater / Condensate System Abnormality.
- The Rx does NOT trip.

Which of the following is an UNEXPECTED alarm if it is locked in 2 minutes after 21 SGFP trips?

a. OHA G-3, EHC SYS TRBL.

b. OHA G-44, COND POL TRBL.

c. Console Alarm RC PRESS DEVIATION HI.

d. Console Alarm RC LOOPS TAVG-TREF DEVIATION.

Answer	c	**Exam Level**	R	**Cognitive Level**	Comprehension	**Facility:**	Salem 1 & 2	**ExamDate:**	12/3/2012

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: 55.41.b(5)B is incorrect because the condensate polisher trouble alarm will be in due to the CN108s (auto open on a SGFP trip) AND the CN109 being open at the same time (polisher in service). D is incorrect because RC loops Tavg-Tref deviation will be expected as rods are driving in due to the turbine runback to 65%. C 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. A is incorrect because G-3 will be in alarm since it receives input from the EHC Control and Status computer, which will have a Loss of Feed pump Runback alarm in. .

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Main Feedwater/Condensate System Abnormalit	S2.OP-AB.CN-0001			26
NOS05CN&FDW09			28	9

L.O. Number
ABCN01E001
ABCN01E005

Objectives

Material Required for Examination

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

Question Source Comments Vision Q113267. Removed procedure transition part of question to make RO level (alarm not expected)vs. SRO level (unexpected alarm AND what procedure addresses unexpected alarm.)

Comment

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

Question Topic RO 11

Given the following condition:

- Unit 2 was operating at 100% power when a 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:** 12/3/2012

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		16	27

L.O. Number
LOPA00E007

Objectives

Material Required for Examination					
Question Source:	Previous 2 NRC Exams	**Question Modification Method:**	Direct From Source	**Used During Training Program**	☐
Question Source Comments	08-01 NRC RO exam (May 2010) Vision Q133648				

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 is in MODE 4.
- RCS pressure is 290 psig.
- RHR HX inlet temperature is 270° F.
- 21 RHR pump is in service in shutdown cooling.
- 22 RHR loop is aligned for ECCS.
- A loss of all off-site power occurs.

Which of the following identifies why S2.OP-AB.LOOP-0001, Loss of Off-Site Power directs operators to initiate S2.OP-AB.RHR-0001, Loss of RHR?

a. The 2A SEC trips 21 RHR pump and does not restart it when 2A EDG connects to 2A vital bus.

b. The SEC's trip all running CCW pumps, and they do not restart when the EDGs connect to their respective vital buses.

c. S2.OP-AB.LOOP-0001 does not consider the initial plant conditions, and always directs initiation of S2.OP-AB.RHR-0001 regardless of whether or not RHR is in operation.

d. The 22RH18, RHR HX Flow Control Valve, fails shut, and the 2RH20 RHR HX Bypass Flow Control Valve fails open. Action is contained in S2.OP-AB.RHR-0001 to re-establish positive control of RHR HX flow.

Answer	a	**Exam Level**	R	**Cognitive Level**	Comprehension	**Facility:**	Salem 1 & 2	**ExamDate:**	12/3/2012

KA:	000056K302	AK3.02	**RO Value:**	4.4	**SRO Value:**	4.7	**Section:**	EPE	**RO Group:**	1	**SRO Group:**	1	55.43

System/Evolution Title Loss of Off-Site Power 056

KA Statement: Knowledge of the reasons for the following responses as they apply to Loss of Off-Site Power: Actions contained in EOP for loss of offsite power

Explanation of Answers: 55.41.b(7,8) The loss of off-site power with NO Safety Injection signal is a SEC MODE II actuation, Blackout. All 3 EDG's will start, the SEC will strip all loads of it's vital bus, shut the EDG output breaker and sequence on BLACKOUT loads. The RHR pumps are NOT blackout loads and will not be started. AB.LOOP-1 asks, at step 3.8, if a RHR pump was running in SDC mode. If the answer is yes, it directs initiation of AB.RHR since the LOOP will result as described above. The CCW pumps WILL be started by their respective SEC's. AB.RHR is NOT always directed, only if a RHR pump was running in SDC mode. The 22RH18 fails as is, and is not the reason for initiating AB.RHR.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Off-site Power	S2.OP-AB.LOOP-0001		4	26

L.O. Number | Objectives

ABLOP1E002

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:

- Salem Unit 1 is in MODE 2 performing a startup by control rods IAW S1.OP-IO.ZZ-0003, Minimum Load to Hot Standby.
- Rx power is stable at 4%.
- Vital Instrument Bus 1D inverter output breaker trips and deenergizes 1D 115VAC Vital Instrument Bus.

One minute after the loss of 1D VIB, which of the following contains the indication(s) that will be illuminated on Reactor Status Panel 1RP4, with NO operator action?

a. Red Reactor Trip lamp.

b. Yellow RCP busses UV for "H" bus lamp.

c. Blue Over Power Rod Stop Manual Bypass for CH IV lamp.

d. Yellow High Flux PRNI CH IV for BOTH High Power and Low Power.

Answer d **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 000057A203 AA2.03 **RO Value:** 3.7 **SRO Value:** 3.9 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Loss of Vital AC Instrument Bus 057

KA Statement: Ability to determine and interpret the following as they apply to Loss of Vital AC Instrument Bus:
RPS panel alarm annunciators and trip indicators

Explanation of Answers: 55.41.b(7) A is incorrect because the reactor has no trip demand from the loss of D VIB. B is incorrect because the CH IV indication is associated with "G" 4KV RCP group bus. 4 group buses are H,E,F,G from 11, 12, 13, and 14 RCPs. C is incorrect because the over power block bypass must be manually aligned. D is correct because the CH IV for BOTH the High power hi flux and low power high flux will be illuminated.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of 1D 115 Vital Instrument bus	S1.OP-AB.115-0004			12

L.O. Number

AB1151E001

Objectives

Material Required for Examination

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

Question Source Comments Vision Q133676

Comment

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

Question Topic RO 14

Given the following conditions:

- Salem Unit 2 is operating at 100% power.
- All Station Air Compressors trip and none can be restarted.
- The Unit 2 ECAC does not start, and cannot be started.
- The Unit 1 ECAC starts and trips after 5 minutes.

Which of the following identifies an action taken on Salem Unit 2 IAW S2.OP-AB.CA-0001, Loss of Control Air, and why?

a. An operator is dispatched to locally shut the 2DR6, AFWST M/U Valve. This is to prevent over flowing the AFWST and causing a spill of hydrogen peroxide to the storm drain system.

b. The Rx is tripped when EITHER Control Air header lowers to <80 psig. This is to prevent an automatic trip on lo-lo SG NR level when the BF19s associated with that header start to drift shut.

c. All Radwaste releases in progress are terminated. This ensures that during a gradual depressurization of the Control Air system a release is not in progress when the dilution medium flowrate may be changing.

d. An operator is dispatched to manually control 23 AFW pump speed which is running at the high speed stop. This ensures the pump does not become steam bound due to the 21-24AF11 valves failing shut with only limited recirc flow provided.

Answer c **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 000065G314 2.3.14 **RO Value:** 3.4 **SRO Value:** 3.8 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Loss of Instrument Air 065

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(10) A is incorrect because while the 2DR6 will be operated locally, the concern is the overflow of water with hydrazine in it, not hydrogen peroxide. C is correct because the bases document says that on page 8 of 12. B is incorrect because BOTH CA header pressures have to be below 80 psig before the rx is directed to be tripped, but the reason is correct. D is incorrect because the action is correct, but the reason is wrong. The AF11s fail open, and pump runout is a concern with the speed failed at the high speed stop and higher steam supply pressure present. (page 9 of 12)

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Control Air	S2.OP-AB.CA-0001			17

L.O. Number

ABCA01E002

Objectives

Material Required for Examination

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

Question Source Comments Vision Q41379 modified from the release valves are shut because…to what do you have to do (terminate any release in progress) and why. The why was the original questions 4 choices. Also modified per technical review

Comment

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

Question Topic RO 15

Given the following conditions:

- Operators are performing actions in 2-EOP-FRCC-1, Response to Inadequate Core Cooling.
- With no other RCPs in service, 23 RCP has been started IAW direction in FRCC-1 and Rx core temperature is lowering.
- 23 RCP was the only RCP able to be started.

Which of the following identifies why 23 RCP would be stopped IAW FRCC-1?

a. RVLIS level has risen to >57% which shows that the fuel is covered and injection flow is present.

b. ALL SG NR levels have lowered <9% which indicates insufficient heat transfer will be available in any RCS loop.

c. At least two RCS Thots have lowered to <350°F which indicates the core is cool and RCP forced circulation is no longer required.

d. 23 RCP #1 seal D/P has lowered to less than 250 psid which is less than the minimum required to prevent mechanical damage to RCP.

Answer	c	Exam Level	R	Cognitive Level	Memory	Facility:	Salem 1 & 2	ExamDate:	12/3/2012

KA:	000074K304	EK3.04	RO Value:	3.9	SRO Value:	4.2	Section:	EPE	RO Group:	2	SRO Group:	2	55.43

System/Evolution Title Inadequate Core Cooling 074

KA Statement: Knowledge of the reasons for the following responses as they apply to Inadequate Core Cooling: Tripping RCPs

Explanation of Answers: 55.41.b(10)The step to isolate the ECCS accumulators is 28.1, just prior to stopping RCPs at step 29. The ECCS accumulators are isolated after intermittent RHR flow has been verified, since this means they have discharged based on RHR discharge pressure capacity. However, SI or Charging system flow is not checked until AFTER the running RCP is stopped in step 29 when RCS Thots (at least 2) are <350°F. There is no concern for RCP damage based on seal D/P. As discussed at Step 23, normal conditions for RCP operation are desired, but not required. The only thing that will prevent RCP start is no SG NR level (<9%) based on potential creep failure of the high temperature SG tubes, but LOSS of SGNR level does not require stopping the RCPS. RVLIS level must be >57% at step 31and be combined with at least 2 RCS Thots <350 and all RCP's already stopped to exit FRCC-1 to LOCA-1.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Inadequate Core Cooling	2-EOP-FRCC-1			22

L.O. Number

FRCC00E006

FRCC00E002

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 16

With the Unit 2 Rx operating at 100% power, which of the following radiation monitors would be the FIRST to provide indication that a nuclear fuel rod had developed a substantial leak?

a. 2R31, Letdown Line.

b. 2R53A-D, N16 MS Line.

c. 2R34, Charging Pumps Area.

d. 2R2, Containment 130' Elevation Area.

Answer a **Exam Level** R **Cognitive Level** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

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(11) With the plant operating at 100% power, letdown will be in service. Failed fuel would immediately release fission products into the RCS. The letdown line would transport these radionuclides and be detected quickly by the 2R31. The 2R2 would respond only if there were a leak in the RCS, since its an area monitor and area radiation levels would take a long time to rise. The R53s detect N16 gammas in the steam line, which would only be present with primary to secondary leakage. The Charging pumps area monitor would rise eventually based on the activity rising in the charging fluid, but it would be diluted by the volume already in the VCT, and the letdown line would see it first and much more significantly.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Radiation Monitoring System	S2.OP-SO.RM-0001			37
Charging, Letdown, and Seal Injection	205328-1	Grid E-5		56

L.O. Number
ABRC02E001

Objectives

Material Required for Examination

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

Question Source Comments Vision Q125679

Comment

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

Question Topic RO 17

Given the following conditions:

- Unit 2 is operating at 100% power when the operators receive several alarms related to the 500KV grid.
- The Electric System Operator calls Unit 2 and directs them to perform a rapid load reduction to 875 MW due to grid instability issues.

Which of the following describes how the load reduction will be performed IAW S2.OP-AB.GRID-0001, Abnormal Grid?

At the EHC Console the PO will depress...

a. the GO pushputton, and ensure the runback automatically stops at ~66% turbine power.

b. SMD #2 RUNBACK and GO PBs, then depress HOLD when Main Generator load lowers < 875 MW.

c. SMD #2 RUNBACK and GO PBs, and ensure the load reduction stops automatically at ~66% turbine power.

d. EITHER the GO pushbutton OR SMD #2 RUNBACK and GO PBs, then depress HOLD when Main Generator load lowers < 875 MW.

Answer b **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 000077A102 AA1.02 **RO Value:** 3.8 **SRO Value:** 3.7 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Generator Voltage and Electric Grid Disturbances 077

KA Statement: Ability to operate and/or monitor the following as they apply to Generator Voltage and Electric Grid Disturbances:
Turbine / generator controls

Explanation of Answers: 55.41.b(10,7) AB.GRID directs the load reduction directed by the ESO due to grid instability be performed IAW Att 4, which says to push SMD #2 if the required end point is >765MW AND <942 MW. It says to press HOLD when the MW value is less than or equal to that directed by the ESO. While depressing the GO PB would work, the procedure says to do it a certain way to ensure consistency amongst the crews (Note on Att 4), so it would be wrong. The MT is normally set up to do a 15% per minute runback to 66% turbine load (~810 Mwe), so while it would get load about where it is supposed to, the procedure doesn't allow you to do it that way. Candidate needs to know how to initiate load reduction, and how it is directed to be stopped.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Abnormal Grid	S2.OP-AB.GRID-0001			17

L.O. Number
ABGRIDE003

Objectives

Material Required for Examination

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

Question Source Comments Vision Q120134. Modified one distracter from SMD 2 or SMD 3 to SMD 2 or GO PB since SMD 3 only appeared in one choice, and GO only appeared in one choice.

Comment

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

Question Topic RO 18

Given the following:

- Unit 1 experienced a Rx trip and Safety Injection from full power due to a RCS leak.
- The control room crew is currently performing 1-EOP-TRIP-3, Safety Injection Termination.
- 11 Charging pump is in service and 12 Charging pump has been secured.
- Charging pump flow through the BIT has been isolated and 1CV68 and 1CV69, Charging Discharge Valves, have been opened.
- The RO fully opens 1CV55, Charging Flow Control Valve, and reports current PZR level is 45% and lowering slowly.

Which of the following describes the action the control room crew should take IAW 1-EOP-TRIP-3?

a. Re-establish charging flow through the BIT and close 1CV68 and 1CV69.

b. Initiate Safety Injection and return to 1EOP-TRIP-1, Rx Trip or Safety Injection, Step 1.

c. Re-start 12 charging pump to establish PZR level stable or rising, and continue in TRIP-3.

d. Allow 5-10 minutes for system conditions to stabilize while monitoring PZR level.

Answer a **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 00WE02K201 EK2.1 **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 interrelations between SI Termination 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(7,8) After stopping one of two centrifugal charging pumps at step 4, charging flow is re-directed from BIT to normal charging line. If this flowpath cannot maintain stable or rising PZR level, the operator will re-establish BIT flow and go to LOCA-2, Post LOCA Cooldown and depressurization since control of RCS inventory is greater than the capacity of normal charging. The basis document specifically says not to re-start the idled CVCS pump, because that would restore subcooling/PZR level and you would end up back at the same step if you went to LOCA-1, then back to TRIP-3. C is incorrect because TRIP-3 is not continued. 12 CVCS pump MIGHT be started IAW CAS to start ECCS pumps as necessary since stem is non-specific about actual PZR level, but continuing in TRIP-3 is not true. Step 7 has operators reestablish charging flow through the BIT and go to LOCA-2. There is no CAS action to initiate SI and go back to TRIP-1.. There is no direction (nor reason) to allow plant conditions to stabilize, maximum charging flow should act on PZR level in seconds, not minutes to change level.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Safety Injection Termination	1-EOP-TRIP-3			25

L.O. Number
TRP003E003
TRP003E005

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

Given the following conditions:

- Unit 2 was operating at 100% power when the RCS developed a SBLOCA.
- 45 minutes after the trip, 2B 4KV vital bus locked out on bus differential.
- Containment pressure is 2.4 psig and lowering very slowly.
- Operators are now performing actions in 2-EOP-LOCA-2, Post LOCA Cooldown and Depressurization.

Which of the following contains an alarm, which if received during performance of LOCA-2, would require the associated response?

a. PZR Low Level alarm at 17%. Start ECCS pumps as necessary.

b. RWST Lo Level console alarm at 15.2 feet. Transfer RCS to Cold Leg Recirculation.

c. OHA A-6 RMS HI RAD OR TRBL associated with 2R53A, 21 MS Line Rad Monitor. Align SGBD to the Waste Header.

d. 21 SG Program Deviation Setpoint Actual console alarm at 28% NR level. Open 21AF21 SG Level Control Valve to raise level in 21 SG.

Answer	b	Exam Level	R	Cognitive Level	Comprehension	Facility:	Salem 1 & 2	ExamDate:	12/3/2012

KA:	00WE03K103	EK1.3	RO Value:	3.5	SRO Value:	3.8	Section:	EPE	RO Group:	2	SRO Group:	2	55.43

System/Evolution Title LOCA Cooldown and Depressurization E03

KA Statement: Knowledge of the operational implications of the following concepts as they apply to LOCA Cooldown and Depressurization: Annunciators and conditions indicating signals, and remedial actions associated with the (LOCA Cooldown and Depressurization).

Explanation of Answers: 55.41.b(10,11) RWST lo level at 15.2' indicates the need to transfer RCS cooling to cold leg recirculation, as identified by the CAS action in LOCA-2. The SG program deviation setpoint is +/-5%, so the alarm at 28% would be valid. However, 22 AFW pump has no power, so opening the 21AF21 would have no effect. The R53s are N2 monitors in the Main Steam Lines, and after the Rx is shutdown do not provide indication of any use. The action to align SGBD is performed in SGTR-1. The PZR level at which ECCS pumps are started is 11% (19% adverse). With containment pressure at 2.4 psig, normal values would be used. The PZR low level alarm comes in at 5% below program, which would be ~22% with the low Tavg expected during a SBLOCA.

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

L.O. Number
LOCA02E005

Objectives

Material Required for Examination

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

Question Source Comments Vision Q127166. Removed procedure from LOCA outside containment, removed response from opening AF21 valve as part of distracter.

Comment

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

Question Topic RO 20

Given the following conditions:

- Unit 2 is attempting to identify and isolate a 400 gpm LOCA into the RHR system which occurred while operating at 75% power.
- 2-EOP-LOCA-6, LOCA Outside Containment, was entered from 2-EOP-TRIP-1, Rx Trip or Safety Injection.
- The source of the water is back leakage from the 23 cold leg injection line.
- A large leak in the RHR system is located on the piping between 21 and 22RH19s, RHR HX DISCH X-CONN VALVES.

Which of the following components, if it failed to respond when directed by LOCA-6, would prevent isolation of the RCS leak outside containment?

a. 2SJ69, RHR SUCT FROM RWST.

b. 22SJ49, RHR DISCH TO COLD LEGS.

c. 22RH19, RHR HX DISCH X-CONN VALVE.

d. 21SJ49, ~~RHR HX DISCH X-CONN VALVE.~~ RHR DISCH TO COLD LEGS.

Answer d **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 00WE04A101 EA1.1 **RO Value:** 4.0 **SRO Value:** 4.0 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title LOCA Outside Containment E04

KA Statement: Ability to operate and / or monitor the following as they apply to LOCA Outside Containment:
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(7,8,10) The leakage from 23 Cold leg flows back through the 21SJ49, then through the 21RH19 cross connect to reach the leak. Leak isolation is attempted first by ensuring closed the RCS-RHR suction isolation valves RH1 and RH2. Then BOTH the RH19s are shut. Since the leakage from the RCS has to flow through the 21RH19 to reach the leak, and it is a normally open valve. Its failure to reposition when directed would prevent leak isolation. The SJ69 is closed after the leak is isolated as above. The 22SJ49 is on the opposite RHR train. Candidate also has to know which RHR train feeds which cold legs when not cross connected.. 21 RHR feeds 21 and 23 cold legs, while 22 RHR train feeds 22 and 24

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
LOCA Outside Containment	2-EOP-LOCA-6			21
ECCS Simplified Drawing	205350-SIMP			4

L.O. Number
LOCA06E002

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

FRHS-1, Response to Loss of Secondary Heat Sink, Step 3 asks, "Is RCS pressure greater than ANY intact or ruptured SG pressure".

Which of the following statements is correct if the operator answers NO?

a. IMMEDIATELY go to Step 23, Bleed and Feed Initiation, since there is no decay heat removal occurring through the SGs.

b. Return to Procedure in effect. Attempts to establish a secondary heat sink would be ineffective at reducing RCS temperature since SG pressure is higher than RCS pressure.

c. Return to Procedure in effect. The RCS has experienced a LOCA large enough that a secondary heat sink is NOT required because decay heat is being removed by break flow.

d. IMMEDIATELY trip all RCPs to prevent further loss of reactor coolant through the LOCA, since a LOOP later in the event could cause a more severe loss of reactor coolant or two-phase RCS flow.

Answer c **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 00WE05K302 EK3.2 **RO Value:** 3.7 **SRO Value:** 4.1 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Loss of Secondary Heat Sink E05

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

Explanation of Answers: 55.41.b(10, 14) The reason for checking RCS pressure > intact or ruptured SG pressure is to check if there is a need to be worried about a secondary heat sink. If RCS pressure is below SG pressures, then a LOCA of sufficient size is present, and break flow will be removing decay heat, along with ECCS injection. Distracter A is incorrect because the criteria for going to bleed and feed is SG WR level. Distracter B is incorrect because a secondary heat sink could actually be established, and could reduce RCS temperature by dumping steam from the SGs. Distracter D is incorrect it is not a CAS of FRHS but is reason for tripping RCPs in TRIP-1 or LOCA-1.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Secondary Heat Sink	2-EOP-FRHS-1	Basis Document	4	24

L.O. Number Objectives

FRHS00E010

Material Required for Examination

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

Question Source Comments Vision Q127090

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 has experienced a steam line break inside containment.
- Operators have entered FRTS-1, Response to Imminent Pressurized Thermal Shock.

Why will the operators be instructed to terminate SI and start RCP(s) if possible?

a. The soak required by FRTS-1 requires SI to be secured. RCPs are started to provide the ability to use spray to depressurize the primary.

b. The soak required by FRTS-1 requires SI to be secured. RCPs are started to provide mixing of cold SI and warm reactor coolant water.

c. Safety Injection flow is a significant contributor to any cold leg temperature decrease or overpressure condition and must be terminated. RCPs are started to minimize temperature gradient across S/G tube sheets.

d. Safety Injection flow is a significant contributor to any cold leg temperature decrease or overpressure condition and must be terminated. RCPs are started to provide mixing of cold SI and warm reactor coolant water.

Answer d **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 00WE08K102 EK1.2 **RO Value:** 3.4 **SRO Value:** 4.0 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Pressurized Thermal Shock E08

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

Explanation of Answers: 55.41.b.(10,8)
A- incorrect - purpose for RCPs is not priority in FRTS-1, soak is not basis for SI. B - incorrect - soak not basis. C - incorrect - SI basis correct, RCP basis not accurate. D-correct -page

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Response to Imminent Pressurized Thermal Sh	2-EOP-FRTS-1	Basis Document	2,13	25

L.O. Number FRTS00E007

Objectives

Material Required for Examination

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

Question Source Comments Vision Q73425. Originally on Seabrook 2003 NRC exam.

Comment

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

Question Topic RO 23

Given the following conditions:

- Operators are performing a natural circulation rapid cooldown on Unit 1 IAW 1-EOP-TRIP-5, Natural Circulation Rapid Cooldown Without RVLIS.
- NO RCPs are running or can be started.
- The control room crew has completed the initial RCS cooldown / depressurization to 500°F / 1600 psig.
- The current time is 1300.

Of the following, which one identifies the EARLIEST time RCS Thot temperatures could be reduced below 450°?

Assume the cooldown will start at 1300 and instantaneously be at the maximum rate allowed.

a. 1316.

b. 1331.

c. 1401.

d. 1501.

~~Answer:~~ ~~b~~ ~~Exam Level~~ ~~R~~ ~~Cognitive Level~~ ~~Application~~ **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 00WE10A102 EA1.2 **RO Value:** 3.6 **SRO Value:** 3.8 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

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

KA Statement: Ability to operate and / or monitor the following as they apply to Natural Circulation with Steam Void in Vessel with/without RVLIS: Operating behavior characteristics of the facility.

Explanation of Answers: 55.41.b(10) RCS temp is at 500 degrees per the stem. The next temp reduction will be to 450° starting at step 9, and the cooldown is directed to be performed at <100°F per hour. This means 30 minutes of cooldown is required. The 1401 distracter is if the 50°/hr rate of step 7 (initial cooldown to 500°F) is used. The 1316 distracter is if the 200°/hr PZR cooldown limit per TS 3.4.10.2.b is used. The 1501 distracter is for both continuity of the choices, and if the 25°F per hour rate is used for cooldown.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Natural Circulation Rapid Cooldown Without RV	1-EOP-TRIP-5			22

L.O. Number
TRP004E004

Objectives

Material Required for Examination

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

Question Source Comments Vision Q116968. Modified to include procedure name. Added that the C/D to 500°F has been performed. Added 1 minute to each choice since the stem asks when can be below 450, and 30 minutes of cooldown would only get to

Comment

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

Question Topic RO 24

Given the following conditions for Unit 1:

- A reactor trip and SI occurred at 0700 due to a 1500 gpm RCS LOCA.
- RHR system problems have resulted in a loss of recirculation capability.
- Current time is 1300 hours.

Conditions present when transitioning to 1-EOP-LOCA-5, Loss of Emergency Recirculation, from 1-EOP-LOCA-1, Loss of Reactor Coolant, due to the loss of recirc capability are:

- RCS subcooling is 10°F.
- All RCPs are secured
- 11 and 12 Charging Pumps are running
- BIT flow - 350 gpm
- RVLIS full range 95%
- 11 SI Pump flow - 250 gpm
- 12 SI Pump flow - 250 gpm
- Containment pressure 4.1 psig

Which of the following identifies the ECCS pumps that should be run following determination of Minimum SI Flow for Decay Heat Removal?

Assume:

- Equal flow from each Charging Pump, and each pump will supply half the original total flow if the other charging pump is secured.
- Each SI pump flow remains constant if the other SI pump is secured.
- RCS subcooling remains between 10°F - 45°F for the duration of this question.

a. ONE charging pump and BOTH SI pumps.

b. ONE Charging pump and ONE SI pump.

c. ONE Charging pump only.

d. ONE SI pump only.

Answer	d	**Exam Level**	R	**Cognitive Level**	Application	**Facility:**	Salem 1 & 2	**ExamDate:**	12/3/2012

KA:	00WE11A202	EA2.2	**RO Value:**	3.4	**SRO Value:**	4.2	**Section:**	EPE	**RO Group:**	1	**SRO Group:**	1	55.43

System/Evolution Title Loss of Emergency Coolant Recirculation E11

KA Statement: Ability to determine and interpret the following as they apply to Loss of Emergency Coolant Recirculation: Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

Explanation of Answers: 55.41.b(10,8) A 1,500 gpm RCS LOCA will deplete the RWST in 2.3 hours. The transfer to CL Recirc will already have been performed. During step 14 of LOCA-5, charging pumps will be reduced to ONE centrifugal, and SI pumps will be reduced to ONE. Starting at Step 19 of LOCA-5, with RCP's secured with <50 degrees subcooling, will use Figure A to determine the ECCS flow required vs. time after trip. 6 hours equals 360 minutes, which is ~225 gpm, but definitely LESS THAN 250 gpm. With the stem stating that charging pump flows remain the same, a single charging pump will be insufficient to supply the required flow. A single SI pump, however, supplying 250 gpm will supply sufficient flow.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Emergency Recirculation	1-EOP-LOCA-5			25

L.O. Number
LOCA05E007

Objectives

Material Required for Examination	RO 24 1-EOP-LOCA-5 flowchart pages 1 & 2

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

Question Source Comments	Vision Q42181, used 3 NRC exams ago (Class 07-01, Aug 2008)

Comment

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

Question Topic RO 25

Given the following conditions:

- Unit 1 has experienced a MSLB at the Main Turbine inlet steam piping.
- All attempts at Main Steamline Isolation have failed.
- Operators have transitioned out of 1-EOP-TRIP-1, Reactor Trip or Safety Injection.
- RCS cooldown rate is 120°/hr.
- RCS pressure is 1300 psig and dropping.
- Charging system SI flowmeter indicates 290 gpm.
- The RCS cooldown is NOT being controlled.

Which choice identifies an action that must be performed IAW 1-EOP-LOSC-2, Multiple Steam Generator Depressurization, and why?

a. Trip all RCP's to reduce heat transfer to the SGs.

b. Reduce AFW to minimize cooldown while still keeping the SG tubes wet.

c. Stop BOTH RHR pumps to prevent damage to RHR pumps from continued operation above shutoff head.

d. Send operators to close all BF19's, BF40's, and BF22's to re-establish a secondary pressure boundary in any SG.

Answer b **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 00WE12K101 EK1.1 **RO Value:** 3.4 **SRO Value:** 3.8 **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 operational implications of the following concepts as they apply to Uncontrolled Depressurization of all Steam Generators:

Components:, capacity, and function of emergency systems.

Explanation of Answers: 55.41.b(10,4)Once out of TRIP-1, no actions other than attempting to close MSLI valve are taken in LOSC-1 prior to going to LOSC-2. Maintaining >1E4 lbm/hr to each S/G keeps tubes from drying out, among other things. Do not trip RCP's because pressure is dropping due to cooldown, and the reason is wrong. Doesn't matter if it's uncontrolled or not. Distracter D is incorrect because we don't close BF22's, but the reason is right. Don't stop RHR pumps because pressure is still dropping, reason is right.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Multiple Steam Generator Depressurization	1-EOP-LOSC-2			22

L.O. Number

LOSC02E004

Objectives

Material Required for Examination

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

Question Source Comments Vision Q59885. Used on "H" RO NRC Exam (2004, 5 NRC exams ago.)

Comment

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

Question Topic RO 26

Given the following conditions:

- Unit 1 has experienced a LBLOCA.
- The crew is responding IAW the EOP network.
- 3 hours after the transfer to Cold Leg Recirc has been accomplished, the STA reports a Purple Path exists for containment Environment due to containment sump level being 80%.

Which of the following would assist in validating that a high containment sump level actually exists?

a. PWST contains 200,000 gallons.

b. Fire Protection Storage Tank levels are both 85%.

c. 3 SW pumps in service with SW header pressure 150 psig.

d. 5 CFCUs running in low speed with SW flow of ~ 1000 gpm each.

Answer	d	**Exam Level**	R	**Cognitive Level**	Application	**Facility:**	Salem 1 & 2	**ExamDate:**	12/3/2012

KA:	00WE15G145	2.1.45	**RO Value:**	4.3	**SRO Value:**	4.3	**Section:**	EPE	**RO Group:**	2	**SRO Group:**	2	55.43

System/Evolution Title Containment Flooding E15

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

Explanation of Answers: 55.41b.(7,9)FRCE-2 checks for possible sources of the excessive sump level in containment. They are: CFCU SW flow, FP to containment isolation valve position, CCW Surge Tank level, Demin Water Storage Tank Level, Primary Water Storage Tank Level. PWST of 200,000 gallons is not enough to have raised containment sump level that much. Tank Capacity completely full is ~240,000 gallons.
SW header pressure of 150 psig is expected with the SW26 shut from the SEC initiation. A lower SW header pressure would help in identifying SW leak in containment.
Each CFCU SW flow is normally ~1600 gpm, and indicates a 3,000 gpm leak into containment is possible. Fire protection Storage tank level change would be inadequate to raise sump level that much.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Response to High Containment Sump Level	1-EOP-FRCE-2			20
Tank Capacity Data	S1.OP-TM.ZZ-0002		24	8

L.O. Number FRCE00E005

Objectives

Material Required for Examination

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

Question Source Comments Vision Q87611

Comment

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

Question Topic RO 27

Which of the following identifies the minimum radiation monitor(s) that must be sensing high radiation conditions for either channel of the Subcooling Margin Monitor to automatically shift to the ADVERSE Mode?

a. EITHER R44A OR R44B, Containment High Range.

b. BOTH R44A AND R44B, Containment High Range.

c. EITHER R2, Containment 130', OR R7 In-Core Seal Table.

d. BOTH R2, Containment 130', AND R7 In-Core Seal Table.

Answer a **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 00WE16A202 EA2.2 **RO Value:** 3.0 **SRO Value:** 3.3 **Section:** EPE **RO Group:** 2 **SRO Group:** 2 55.43

System/Evolution Title High Containment Radiation E16

KA Statement: Ability to determine and interpret the following as they apply to High Containment Radiation:
Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

Explanation of Answers: 55.41.b(11) Either of the Containment high Range monitors reaching 1E5 R/hr will automatically place the SMM in ADVERSE Mode. The other area monitors in containment listed do not input into the SMM.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Abnormal Radiation	S2.OP-AB.RAD-0001	Attachment 5	17-18	29

L.O. Number

RMS000E007

FRCE00E005

Objectives

Material Required for Examination

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

Question Source Comments Vision Q73944 replaced area monitors outside containment with 2 others inside containment. Removed window dressing.

Comment

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

Question Topic RO 28

Given the following conditions:

- Unit 2 is operating at 70% power and stable after a load reduction was completed 10 minutes ago.
- Rod Control is in MANUAL control.
- The highest actual Tave-Tref deviation is 4.0°F.

Which choice identifies the rod speed that would be present initially if the Rod Control Selector Switch were placed in AUTO?

a. 24 spm.

b. 40 spm.

c. 48 spm.

d. 56 spm.

Answer b **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 001000A101 A1.01 **RO Value:** 3.8 **SRO Value:** 4.2 **Section:** SYS **RO Group:** 2 **SRO Group:** 2 55.43

System/Evolution Title Control Rod Drive System 001

KA Statement: Ability to predict and/or monitor changes in parameters associated with operating the Control Rod Drive System controls including: T-ave. and no-load T-ave

Explanation of Answers: 55.41.b(6,7)Rod speed is determined in AUTO by Auct High Tavg vs. Tref (PT-505, Turbine steamline Inlet Pressure). . The AUTO rod speed program is 8 spm from 1.5-3.0°F deviation. From 3.0-5.0 it ramps up linearly from 8 spm to 72 spm. This correlates to 16 spm per 1/2°F temp change. 8 spm (@3.0) + 32 spm (from 3.0 to 4.0)= 40 spm.
The 56 spm distracter is based upon using an incorrect linear ramp from 1.5 - 5.0 degrees was used.
The 48 spm distracter is based on normal manual rod control speed. The Power mismatch circuit in rod control will have cycled through over 5 time constants and its effect on rod speed will be zero ten minutes after the load reduction has been stopped.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Rod Control System Lesson Plan	NOS05RODS00-11	AV2619G.ACAD.S9-1	TP-14	11

L.O. Number

RODS00E012

Objectives

Material Required for Examination

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

Question Source Comments Vision Q88062

Comment

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

Question Topic RO 29

Given the following conditions:

- Unit 1 is operating at 30% power returning from a mid-cycle outage.
- Rod Control is in Manual.
- 14 RCP trips.

Which of the following describes how 14 RC Loop Tavg will be affected 5 minutes later with NO operator action when compared to pre-event Tavg in 14 RC Loop?

14 RC Loop Tavg will be…

a. Lower because backflow from the unaffected loops will cause Tc to rise and equal Thot.

b. Higher because backflow from the unaffected loops will cause Tc to rise and equal Thot.

c. Lower because less heat transfer will occur in 14 SG due to the loss of forced flow in that loop.

d. Higher because less heat transfer will occur in 14 SG due to the loss of forced flow in that loop.

Answer c **Exam Level** R **Cognitive Level** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 003000K503 K5.03 **RO Value:** 3.1 **SRO Value:** 3.5 **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: Effects of RCP shutdown on T-ave., including the reason for the unreliability of T-ave. in the shutdown loop

Explanation of Answers: 55.41.b(3) With Rx power <36%, the reactor will not trip upon a loss of a single RCP. 14 RCP will coast down, and flow will reverse in that loop. A differential pressure will exist across a loop in which a RCP is not running due to the head of other RCPs applied to the cold leg side of the vessel. This high pressure (cold leg side) will induce flow in an idle loop in the reverse direction. This means reactor coolant from the cold leg will flow back through the idle RCP and SG. This will lower Tavg in the idle loop. Th and Tc in the affected loop will reverse, and the original Tc will be greater than Th. The 2 distracters with the Th/Tc equaling are incorrect because Tc will rise >Th in that loop.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Reactor Coolant System Lesson Plan	NOS05RCS000-09		25	09

L.O. Number RCPUMPE016

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

Given the following conditions:

- Unit 2 is operating at 100% power.
- 21 Charging pump is C/T
- 23 Charging pump trips.
- 22 Charging pump cannot be immediately started.

Which of the following describes the impact of the loss of Seal Injection Flow?

a. VCT level will lower due to the lower seal leakoff flow, and auto makeup to the VCT will be initiated.

b. If seal injection cannot be restored within 5 minutes, operators will trip the Rx IAW CAS action in S2.OP-AB.RCP-0001, Reactor Coolant Pump Abnormality.

c. Flow from the RCS past the Thermal Barrier heat exchanger will maintain RCP seal temperature and allow plant operation to continue while attempting to restore charging flow.

d. 13 Charging pump (Unit 1) will be started and supply Unit 2 charging header IAW S2.OP-AB.CVC-0001, Loss of Charging. This will require a Unit 1 shutdown to be initiated due to 13 Charging pump suction alignment to the Unit 1 RWST.

Answer c **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 003000K602 K6.02 **RO Value:** 2.7 **SRO Value:** 3.1 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Reactor Coolant Pump System 003

KA Statement: Knowledge of the of the effect of a loss or malfunction on the following will have on the Reactor Coolant Pump System: RCP seals and seal water supply

Explanation of Answers: 55.41.b(7) A is incorrect because when all 3 charging pump breakers are open, letdown orifice isolation valves automatically shut, so letdown flow is zero. Charging pumps are using no VCT capacity. Seal return will still be going to VCT, so VCT level will be rising. B is incorrect because as AB.RCP directs Rx trip if BOTH seal injection and Thermal Barrier flows are lost, not just one or the other. C is correct because it describes the flowpath of RCP seal cooling flow when normal seal injection flow has been lost. D is incorrect because AB.CVC-1 direct lining up Unit 1 PDP (13), it would require a Unit 2 shutdown, not a Unit 1 shutdown based on higher borated water supplied from Unit 1 RWST to Unit 2 RCS. Trainee may recognize that TS 3.0.3 is present when no charging pumps are available, but correct answer is worded to allow time to attempt to restore charging flow.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Charging	S2.OP-AB.CVC-0001			9
Reactor Coolant Pump Abnormality	S2.OP-AB.RCP-0001			21

L.O. Number Objectives

RCPUMPE008

Material Required for Examination

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

Question Source Comments Q41806 concept of RCS flowing up shaft to supply seals. Added what is the effect part to match K/A.

Comment

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

Question Topic RO 31

Given the following conditions:

- The on-coming shift assumes the watch with Unit 1 operating at 100% power steady state.
- 13 Charging Pump is in service with the Master Flow Controller in Manual.
- RCP seal injection flow is 8 gpm per pump.
- RCP seal leakoff flow is 2.0 gpm per pump.
- Halfway through their shift, operators receive console alarm VCT Level Hi-Lo.
- A CVCS makeup system failure has caused VCT level to rise to 87.2%.
- VCT pressure has risen to 35 psig.
- CVCS makeup is now isolated.

Which of the following identifies how the current VCT level and pressure has affected the CVCS system when compared to conditions at the beginning of the shift, and how are the operators directed to respond IAW S1.OP-AR.ZZ-00012, Control Console 1CC2?

a. Charging flow has risen. Ensure 1CV35 VCT 3 WAY INLET V is directed to the CVCS HUT.

b. Letdown flow has risen. Ensure 1CV35 VCT 3 WAY INLET V is directed to the CVCS HUT.

c. Seal Leakoff flows have lowered. Open 1CV243 VCT VENT ISOL VALVE.

d. Seal Injection flow has lowered. Open 1CV243 VCT VENT ISOL VALVE.

Answer	a	**Exam Level**	R	**Cognitive Level**	Application	**Facility:**	Salem 1 & 2
ExamDate:	12/3/2012						

KA:	004000A218	A2.18	**RO Value:**	3.1	**SRO Value:**	3.1	**Section:**	SYS	**RO Group:**	1	**SRO Group:**	1
55.43												

System/Evolution Title Chemical and Volume Control System 004

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

High VCT level

Explanation of Answers: 55.41.b(7,10) Stem conditions indicate that something has occurred which has caused VCT level and pressure to rise. The increased pressure will cause charging flow to rise since the MFC is in manual. D is incorrect because seal injection flow will have risen because of the increased NPSH to the charging pump and resultant higher discharge pressure. Opening the VCT vent is not directed. VCT high pressure alarm occurs at 50 psig, at which time the vent would be open. A is correct because the ARP for high level says to ensure the CV35 is directed to CVCS HUT, it should have tripped to full divert at 87% rising. B is incorrect because of same reason as A above. B is incorrect because letdown flow would not rise, it would lower due to the increase backpressure from the VCT, but the action is correct.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Control Console 1CC2	S1.OP-AR.ZZ-0012			34

L.O. Number
CVCS00E015
CVCS00E016

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 32

2CV21, Letdown Demin Bypass Valve, will automatically reposition to bypass the CVCS Mixed Bed Demineralizers at the Letdown HX Outlet temperature of….

a. 120°F.

b. 127°F.

c. 130°F.

d. 136°F.

Answer d **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 004000K416 K4.16 **RO Value:** 2.6 **SRO Value:** 3.0 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Chemical and Volume Control System 004

KA Statement: Knowledge of Chemical and Volume Control System design feature(s) and or interlock(s) which provide for the following:
Temperature at which the temperature control valve automatically diverts flow from the demineralizer to the VCT; reason for this diversion

Explanation of Answers: 55.41.b(5) The 2CV21 will reposition to divert flow from the CVCS demineralizers at 136°F. 130°F is nominal charging temp entering Regen HX. Letdown HX outlet Hi Temp Alarm at 120°F in Control Room (computer point T0145A; TE-130B). Letdown HX Design Cooldown 380°F to 127°F with 95°F CCW inlet at 1000 gpm flow rate for CCW.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
PWR Components Lesson Plan				
CVCS Demineralizers-Normal Operations	S2.OP-SO.CVC-0012			32
Overhead Annunciators Window E	S2.OP-AR.ZZ-0005	E-41	55	19

L.O. Number
CVCS00E004

Objectives

Material Required for Examination

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

Question Source Comments Vision Q39286 Used concept of letdown flow divert at 136°F, made 2 and 2 and also added why it diverts.

Comment

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

Question Topic	RO 33

Given the following conditions:

- Unit 2 is in MODE 4.
- RCS Cooldown is in progress.
- 21 RHR Pump and Heat Exchanger are in service to provide shutdown cooling.
- 22 RHR loop is aligned for ECCS.
- CRS directs the RCS cooldown rate be REDUCED.

Of the following, which describes how RHR system flow will be adjusted IAW S2.OP-SO.RHR-0001, Initiating RHR, to lower the cooldown rate?

a. Throttle closed on 21RH18, RHR Heat Exchanger Flow Control valve, while throttling closed on 2RH20, RHR Heat Exchanger Bypass valve to maintain total RHR flow constant.

b. Throttle open on 21RH18, RHR Heat Exchanger Flow Control valve, while throttling closed on 2RH20, RHR Heat Exchanger Bypass valve to lower total RHR flow.

c. Throttle open on 21RH18, while throttling open on 2RH20 to raise RHR Heat Exchanger bypass flow.

d. Throttle closed on 21RH18, while throttling open on 2RH20 to maintain total RHR flow constant.

Answer	d	**Exam Level**	R	**Cognitive Level**	Application	**Facility:**	Salem 1 & 2	**ExamDate:**	12/3/2012

KA:	005000A402	A4.02	**RO Value:**	3.4*	**SRO Value:**	3.1	**Section:**	SYS	**RO Group:**	1	**SRO Group:**	1	55.43	☐

System/Evolution Title	Residual Heat Removal System	005

KA Statement: Ability to manually operate and/or monitor in the control room:
Heat exchanger bypass flow control

Explanation of Answers: 55.41.b(5,8)Throttling closed on the RHR HX outlet valve while throttling the bypass valve open will pass less water through the RHR heat exchanger, therefore reducing the cooldown rate while maintaining stable total RHR system flow. A is incorrect because throttling closed both the RH18 and RH20 will not maintain flow constant. B & C are incorrect because it would raise the cooldown rate by passing more flow through RHR HX.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Initiating RHR	S2.OP-SO.RHR-0001			27
RHR Simplified Drawing	205332-SIMP			2

L.O. Number
RHR000E004

Objectives

Material Required for Examination	

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

Question Source Comments	Vision Q77960

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 is in MODE 5.
- BOTH loops of RHR are in service for Shutdown Cooling.
- RCS temperature is 190°F and stable.
- Each loop is supplying 1800 gpm flow.
- 2RH20 is 10% open.
- Conditions to transition to MODE 4 are NOT met.
- The air line supplying the 21RH18, RHR HX Outlet FCV breaks, and air is lost to 21RH18.

Which of the following describes the initial effect this air line failure will have?

a. There will be no effect on the RHR system.

b. 2RH20 will have to be throttled in the open direction to prevent a RCS cooldown.

c. 22RH18 will have to be throttled in the closed direction to prevent a RCS cooldown.

d. 22RH18 will have to be throttled opened to ensure RCS temperature is maintained <200°F.

Answer a **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 005000K410 K4.10 **RO Value:** 3.1 **SRO Value:** 3.1 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Residual Heat Removal System 005

KA Statement: Knowledge of Residual Heat Removal System design feature(s) and or interlock(s) which provide for the following: Control of RHR heat exchanger outlet flow

Explanation of Answers: 55.41.b(7,8) A is correct because the RH18 valves are fail as-is valve. Losing the air supply will not affect the stable system conditions as described in the stem. B is incorrect but plausible if it is thought the 21RH18 fails open. C is incorrect but plausible if it is thought the 21RH18 fails open. D is incorrect but plausible if it is thought the 21RH18 fails shut.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Control Air	S2.OP-AB.CA-0001		36	17
RHR Simplified Drawing	205332-SIMP			2

L.O. Number

RHR000E004

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 35

Salem Unit 1 is operating at 100% power when a loss of ALL AC power occurs.

Which of the following identifies a consequence if ALL AC power remains deenergized for at least one day?

a. Containment temperature rise to near saturation conditions as RCS inventory is released which will complicate recovery when AC power is restored.

b. Containment degradation will result from sustained pressure above 15 psig after RCDT reliefs lift and remain open.

c. Loss of ECCS pumped injection capability coupled with RCP seal leakage will result in core uncovery.

d. PZR PORVs cycling would ultimately result in SBLOCA.

Answer c **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 006000K301 K3.01 **RO Value:** 4.1 **SRO Value:** 4.2 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Emergency Core Cooling System 006

KA Statement: Knowledge of the effect that a loss or malfunction of the Emergency Core Cooling System will have on the following: RCS

Explanation of Answers: Containment pressure is expected to rise to ~ 3 psig and temperature by 40°F as the RCS drains through the RCP seals. Time to core uncovery as shown on Figure 40 in lesson plan, best case, is <20 hours. RCS inventory will be released to containment, however, the containment is designed for a LBLOCA in which all the mass in the RCS is released to the containment and long term recovery is not affected.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of All AC Power Lesson Plan	NOS05LOPA00-04			4

L.O. Number

LOPA00E002

Objectives

Material Required for Examination

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

Question Source Comments DC Cook 2002 NRC Exam, modified to Salem conditions and replaced poor distracters.

Comment

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

Question Topic RO 36

Given the following condition:

- Unit 1 has initiated a Safety Injection while in MODE 3 in response to a LBLOCA.

Choose the set of valves which would prevent some portion of ECCS injection flow from occurring if they did NOT reposition upon the SI signal.

a. 1SJ12 AND 1SJ13, BIT Outlet.

b. 1CV40 AND 1CV41, VCT Outlet.

c. 11SJ49 AND 12SJ49, RHR Discharge to Cold Leg.

d. 11SJ44 AND 12SJ44, Containment Sump Isolation.

Answer a **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 006000K610 K6.10 **RO Value:** 2.6 **SRO Value:** 2.8 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Emergency Core Cooling System 006

KA Statement: Knowledge of the of the effect of a loss or malfunction on the following will have on the Emergency Core Cooling System: Valves

Explanation of Answers: 55.41.b(8) A is correct because BIT inlet (SJ4/5) and outlet valves (SJ12/13) are normally shut and receive an open signal from SSPS on a SI. B is incorrect because while the CV40 and 41 receive a close signal, their failure to position will not affect charging pump suction, since it automatically realigns with the SJ1 and SJ2 opening to provide suction from the RWST. C is incorrect because SJ49 valves are normally open at power, and do not re-position during a LOCA, but would expect to have ECCS injection flow from RHR pumps during LBLOCA. D is incorrect because SJ44 valves are opened in LOCA-3 during transfer to CL recirc, and do not provide any ECCS injection flow.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
ECCS Simplified Drawing	205250-SIMP			
Preparation of the Safety Injection system for O	S1.OP-SO.SJ-0001		28	14

L.O. Number

ECCS00E016

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 37

Which of the following describes Pressurizer Relief Tank (PRT) response when a bubble is being drawn in the PZR after a vacuum refill of the Reactor Coolant System IAW S2.OP-SO.RCS-0002, Vacuum Refill of the RCS?

PRT....

a. pressure will rise slowly as operators vent air and non-condensibles by opening the Pressurizer PORVs.

b. level will rise rapidly as the Pressurizer PORVs cycle automatically in response to the solid PZR expanding.

c. pressure will rise rapidly as the Pressurizer PORVs cycle automatically in response to the solid PZR expanding

d. level will rise slowly as operators maintain Pressurizer pressure during RCP bumps by opening the Pressurizer PORVs.

Answer a **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 007000K502 K5.02 **RO Value:** 3.1 **SRO Value:** 3.4 **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 operational implications of the following concepts as they apply to the Pressurizer Relief Tank/Quench Tank System:
Method of forming a steam bubble in the PZR

Explanation of Answers: 55.41.b(3) A is correct because operators will perform a 10-15 minute vent of the PZR while drawing a bubble (Step 5.3.28), with PZR level 40-60% (Step 5.3.5). There will be minimal liquid carryover, but venting will slowly raise PRT pressure. B and C are incorrect because the PORVs are controlled in manual. D is incorrect because the RCP bumps are performed prior to a vacuum being used in the RCS, and PORVs are in auto during bumps, but will be opened after the RCP is secured for venting.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Vacuum Refill of the RCS	S2.OP-SO.RC-0002			31

L.O. Number
PZRPRTE012

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

With Unit 2 in MODE 4, which one of the following describes the normal and loss-of-air positions of the Component Cooling Water Surge Tank Vent Valve 2CC-149?

2CC149 is normally _____ and fails _____ upon a total loss of its air supply.

a. shut; open.

b. open; open.

c. shut; shut.

d. open; shut.

Answer	d	**Exam Level**	R	**Cognitive Level**	Memory	**Facility:**	Salem 1 & 2	**ExamDate:**	12/3/2012

KA:	008000K408	K4.02	**RO Value:**	2.9	**SRO Value:**	2.7	**Section:**	SYS	**RO Group:**	1	**SRO Group:**	1	55.43

System/Evolution Title Component Cooling Water System 008

KA Statement: Knowledge of Component Cooling Water System design feature(s) and or interlock(s) which provide for the following:
Operation of the surge tank, including the associated valves and controls

Explanation of Answers: 55.41.b(7). 2CC149 is a normally open vent valve which automatically shuts on high radiation in the Surge tank from 2R17A, and fails shut on loss of air (and loss of control power.). The valve is AU (automatic operation) in ALL Modes of operation.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
No. 2 Unit Component Cooling	205331-1	Grid F-2		53
Component Cooling Lesson Plan	NOS05CCW000-07		20	7

L.O. Number

CCW000E006

Objectives

Material Required for Examination

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

Question Source Comments Vision Q39302 editorially modified to remove window dressing and common components found in all choices.

Comment

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

Question Topic RO 39

Following a loss of offsite power, 2A 4KV Vital Bus fails to reenergize.

Which of the following describes the PZR heater group(s) which are available, or will be made available, to maintain PZR pressure while responding IAW TRIP series EOPs?

a. Backup heater group 21 only.

b. Backup heater group 22 only.

c. Both backup heater groups only.

d. All backup and control heater groups.

Answer a **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 010000K201 K2.01 **RO Value:** 3.0 **SRO Value:** 3.4 **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:
PZR heaters

Explanation of Answers: 55.41.b(7) Control Group heaters are powered from 2G non vital bus, and does not have an emergency power supply. 21 Backup Heater Group is normally powered from 2G non vital bus, but has an emergency power supply from the 2C vital bus. 22 Backup Heater Group is normally powered from 2E non vital bus, but has an emergency power supply from the 2A vital bus.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
2EP 480V Pressurizer Heater Bus One-Line	601397			15
2GP 480V Pressurizer Heater Bus One-Line	601398			12

L.O. Number
PZRP&LE005

Objectives

Material Required for Examination

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

Question Source Comments Vision Q58200. Changed loss of 2B bus to loss of 2A bus which changes correct answer from both backup heater groups to only 22 backup heater group.

Comment

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

Question Topic: RO 40

Given the following conditions:

- Unit 2 is operating at 100% power.
- A power reduction from 100% to 20% Rx power will be performed at 1% per minute IAW S2.OP-AB.LOAD-0001, Rapid Load Reduction.
- Prior to initiating the down power, the Charging Master Flow Controller fails as is.

Which of the following is CLOSEST to what actual PZR level will be when the downpower is completed and RCS Tavg is exactly on program?

a. 22%.

b. 28%.

c. 51%.

d. 59%.

Answer	b	**Exam Level**	R	**Cognitive Level**	Comprehension	**Facility:**	Salem 1 & 2	**ExamDate:**	12/3/2012

KA:	011000K604	K6.04	**RO Value:**	3.1	**SRO Value:**	3.1	**Section:**	SYS	**RO Group:**	2	**SRO Group:**	2	55.43

System/Evolution Title: Pressurizer Level Control System | 011

KA Statement: Knowledge of the of the effect of a loss or malfunction on the following will have on the Pressurizer Level Control System:
Operation of PZR level controllers

Explanation of Answers: 55.41.b(7). Program PZR level is clipped at 59%. As the downpower occurs, there will be an outsurge from the PZR as the RCS contracts due to lowering Tavg. At 20% power, RCS Tavg exactly on program is 551.6°, (AB.ROD-3 Attachment 1) which would give a program level of 28.3%. (AB.ROD-3 Attachment 2). A is incorrect but plausible since it is the no load PZR program level. D is incorrect but plausible if the candidate thinks that with charging in manual PZR level remains at its current level. C is the PZR level for 80% Rx power (569.5°F)

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Continuous Rod Motion	S2.OP-AB.ROD-0003			21

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 41

With Unit 2 at 100% power, Containment Pressure Channel I (one) indication became erratic and the channel was removed from service IAW S2.OP-SO.RPS-0005, Placing Containment Pressure Channel in Tripped Condition.

What is the plant response if Containment Pressure Channel IV (four) subsequently fails high?

a. No response other than channel related alarms.

b. An AUTO Safety Injection actuation on 2/3 channels tripped.

c. Safety Injection, Containment Spray, Main Steamline Isolation and Phase B Isolation all actuate.

d. Main Steamline Isolation and Phase B Isolation. Containment Spray valves reposition but the pumps do not start.

Answer a **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 012000A301 A3.01 **RO Value:** 3.8 **SRO Value:** 3.9 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Reactor Protection System 012

KA Statement: Ability to monitor automatic operations of the Reactor Protection System including:
Individual channel

Explanation of Answers: 55.41.b(7) Cont press Channel I only feeds Cont Hi-Hi (Spray act) it does not feed the Cont Hi (SI) circuits. Containment Spray system bistables are energized to actuate, so when the failed channel is removed from service, its Spray actuation bistable is NOT tripped, it is removed from inputting to Spray coincidence to prevent one of the remaining channels from actuating cont spray if it fails. This leaves the SI circuitry still 2/3 on channels I, II, and III, and the containment spray actuation goes to 2/3 of the remaining channels

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
RPS Safeguards Actuation System	221057			22
Placing a Containment Pressure Channel in the	S2.OP-SO.RPS-0005			2

L.O. Number

RXPROTE012

Objectives

Material Required for Examination

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

Question Source Comments Vision Q134992

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 in MODE 2 during a startup.
- A LOCA causes containment pressure to exceed 15 psig.

Which of the following valves indicating OPEN in the control room means that it has failed to reposition properly?

a. 21SW122, CC HX SW INLET VALVE.

b. 22CC3, 21-23 HEADER X-OVER VALVE.

c. 23BF22, SG FW STOP CHECK VALVE.

d. 24MS167, MAIN STEAMLINE ISOLATION VALVE.

Answer d **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 013000A403 A4.03 **RO Value:** 4.5 **SRO Value:** 4.7 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Engineered Safety Features Actuation System 013

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

Explanation of Answers: 55.41.b(7) 21SW122 is a normally open valve that recieves a CLOSE signal upon a MODE III SEC initiation, SI plus Blackout. It's status is displayed on 2RP4. 22CC3 is a normally open valve which does not have any automatic action. It is plausible because other CCW system valves reposition on SI and/or Phase B, and the SJ113 valves also have "X-Over" designators, and they reposition on RWST lo lo level. 23BF22 does not receive a shut signal from the MSLI signal that occurs at 15 psig in containment. All MS167 valves receive a SHUT signal on the hi-hi containment pressure (15 psig)

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Safeguards Actuation Signals	221057			22

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 43

Given the following conditions:

- Unit 2 was tripped from 100% power about 16 minutes ago.
- IRNI 2N35 indicates 2.0 E-11 Amps.
- IRNI 2N36 indicates 2.0 E-10 Amps.
- Channel I SUR is -0.3 dpm
- Channel II SUR is -0.06.

Which of the following describes the condition present, and any action(s) required to be performed as a result of this condition?

Intermediate range NI's indicate that...

a. 2N35 is over compensated. Manually energize Source Range channels.

b. 2N36 is under compensated. Manually energize Source Range channels.

c. 2N35 is under compensated. Ensure Source Range channels automatically energize when 2N36 lowers to 7.0 E-11 Amps.

d. 2N36 is over compensated. Ensure Source Range channels automatically energize when 2N36 lowers to 7.0 E-11 Amps.

Answer b **Exam Level** R **Cognitive Level** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 015000A202 A2.02 **RO Value:** 3.1 **SRO Value:** 3.5* **Section:** SYS **RO Group:** 2 **SRO Group:** 2 55.43

System/Evolution Title Nuclear Instrumentation System 015

KA Statement: Ability to (a) predict the impacts of the following on the Nuclear Instrumentation System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation:
Faulty or erratic operation of detectors or compensating components

Explanation of Answers: 55.41.b(6,10) TRIP-2 step 38 asks if both IRNI channels are reading <7E-11 A. If they are not, it asks if under compensation is preventing proper operation. If yes then the operator is instructed to manually energize SR channels. IRNI channels normally continue to lower until off scale on control console. If the reading is higher that expected, and SUR is abnormally low as indicated in stem, this provides justification for an undercompensated instrument, which allows more lower energy gammas to be seen. on instrument

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Reactor Trip Response	2-EOP-TRIP-2		5	25

L.O. Number

EXCOREE009

EXCOREE010

Objectives

Material Required for Examination

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

Question Source Comments Vision Q61948. Added SUR for both channel as this would be available in CR and gives additional indication of compensation problem. Replaced 2 distracters with additional over/under compensated choices with wrong actions.

Comment

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

Question Topic RO 44

Given the following conditions:

- A LOCA is in progress.
- Operators have transitioned out of EOP-TRIP-1, Reactor Trip or Safety Injection.

Which of the following indicates a superheat condition exists in the core, and what CFST is applicable?

a. 5 or more CETs > 1200°F. RED path for Core Cooling.

b. 5 or more CETs > 1200°F. PURPLE path for Core Cooling.

c. ALL CETs 650°F with RVLIS Full Range 35%. RED path for Core Cooling.

d. ALL CETs 650°F with RVLIS Full Range 74%. PURPLE path for Core Cooling.

Answer	a	**Exam Level**	R	**Cognitive Level**	Application	**Facility:**	Salem 1 & 2	**ExamDate:**	12/3/2012

KA:	017000K503	K5.03	**RO Value:**	3.7	**SRO Value:**	4.1	**Section:**	SYS	**RO Group:**	2	**SRO Group:**	2	55.43

System/Evolution Title In-Core Temperature Monitor System 017

KA Statement: Knowledge of the operational implications of the following concepts as they apply to the In-Core Temperature Monitor System: Indication of superheating

Explanation of Answers: 55.41.b.(5,10)With CETs indicating >1200°F...."this temperature indicates that most liquid inventory has already been removed from the RCS and that core decay heat is superheating steam in the core."(page 6) This is a FRCC RED path entry to FRCC-1 Response to Inadequate Core Cooling. B is incorrect because its priority (PURPLE) is wrong. The 2 distracters with CETs at 650 °F are wrong first because CFST Basis Doc, page 10 states that at least 5 CETs have to be >700°F to indicate superheat is present at the core exit. With <700°F, there is still an entry into Core Cooling PURPLE path if RVLIS Full Rangfe is <39%. C is incorrect because of the lack of superheat and RVLIS level indicates PURPLE Path.. D is incorrect because it is not indicated that superheat exists, and a YELLOW path not PURPLE path.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Critical Safety Functions Status Trees Basis Do	2-EOP-CFST-1		6, 10, Fig	25

L.O. Number

FRCC00E001

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

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 21 Containment Spray pump.

Answer c **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 022000A102 A1.02 **RO Value:** 3.6 **SRO Value:** 3.8 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Containment Cooling System 022

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

Explanation of Answers: 5541.b.(8)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 21 CS pump will already be running..

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem FSAR		6, 15		

L.O. Number
CSPRAYE002
CONTMTE002

Objectives

Material Required for Examination

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

Question Source Comments Vision Q113269. Modified Distracter D from 22 to 21 CS pumps since 2 of the answers (A and D) had equipment that would not be available due to loss of 2C bus.

Comment

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

Question Topic RO 46

Given the following conditions:

- A loss of reactor coolant has occurred which results in containment pressure rapidly rising to 18 psig.

While walking down the control boards 25 minutes later to prepare for a crew brief, which of the following locked in Overhead alarms would be EXPECTED for these conditions?

a. E-5, SR DET VOLT TRBL.

b. D-43, SPRY ADD TK LVL LO.

c. C-29, 24 CFCU WTRFLO TRBL.

d. B-7, TURB AREA SW HDR PRESS HI.

Answer b **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 026000G431 2.4.31 **RO Value:** 4.2 **SRO Value:** 4.1 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Containment Spray System 026

KA Statement:

Knowledge of annunciator alarms, indications, or response procedures.

Explanation of Answers:

55.41.b(8) Spray eductor flow is nominally 75 gpm. Normal level 75%. Administratively max level 90% (3900 gal as shown in SC.CH-AD.CS-0415) Alarm occurs at 67%. Normal level 3,400 gallons. Alarm at 3,050 gallons. D-43 will occur ~ 5 minutes into event. Transition out of TRIP-1 ~ 15 minutes. E-5 is not expected to be in alarm 25 minutes after the trip because it is indication of the SR instruments being energized when they should not be with respect to turbine power above or below 15%. Source range automatically energize between 15-18 minutes following a trip. C-29 is not expected because it indicates CFCU SW valve alignment problem with the CFCU running. It is plausible because the CFCU Airflow Trouble alarm WILL be in alarm, as it occurs when the damper alignment is not correct for running in HIGH speed, and the CFCU will be running in LO speed following an accident. B-7 would not be in alarm as SW to the TGA is automatically isolated by the SECs.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Overhead Annunciators B,C,D,E	S2.OP-AR.ZZ-0002,3,4,5			35,17,26
Tank Curves	S2.OP-TM.ZZ-0002			8

L.O. Number

CSPRAYE008

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:

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

Which of the following identifies which Containment Iodine Removal Units (IRUs) can be started if required?

a. 11 IRU ONLY.

b. 12 IRU ONLY.

c. 11 or 12 IRUs.

d. NEITHER IRU is available.

Answer d **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 027000K201 K2.01 **RO Value:** 3.1* **SRO Value:** 3.4* **Section:** SYS **RO Group:** 2 **SRO Group:** 2 55.43

System/Evolution Title Containment Iodine Removal System 027

KA Statement: Knowledge of bus power supplies to the following:
Fans

Explanation of Answers: 55.41.b(9) Containment IRUs are powered from G and E non-vital 460VAC. With the loss of off-site power, none of the non vital busses are energized. The distracters are based on the operator knowing that the loading of a vital bus in Mode IV doesn't have any bearing on IRU operation.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
1E1 Aux Building 460-230V One line	207916			26
1G1 Aux Building 460-230V One line	207919			23

L.O. Number
CONTMTE004

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 how uncovering of the fuel in the Spent Fuel Pool (SFP) is prevented if a leak were to develop on the in-service Spent Fuel Pool Cooling Pump?

a. Automatic trip of the in-service SFP Cooling pump on low level in the SFP.

b. Automatic makeup to the SFP combined with the lo level alarm to alert the Control Room.

c. Locating the SFP Cooling pump suction line close to the surface of the pool, and an anti-siphon hole in the return line to the SFP.

d. Locating the SFP Cooling pump discharge line close to the surface of the pool and an anti-siphon hole in the suction line to the SFP Cooling pumps.

Answer c **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 033000K403 K4.03 **RO Value:** 2.6 **SRO Value:** 2.9 **Section:** SYS **RO Group:** 2 **SRO Group:** 2 55.43

System/Evolution Title Spent Fuel Pool Cooling System 033

KA Statement: Knowledge of Spent Fuel Pool Cooling System design feature(s) and or interlock(s) which provide for the following:
Anti-siphon devices

Explanation of Answers: 55.41.b(4) There are neither auto SFP pump trips nor auto M/U to the SFP. The suction line is located 4 ft below the surface to minimize level lost if a leak were to develop below the level of the pool in the SFP Cooling system, while the return to the SFP is located 6' above the fuel. The return line has a 1/2' hole drilled in it to prevent it from siphoning the level back to the SFP Cooling pumps on a leak.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Spent Fuel Pool Cooling	205233			26

L.O. Number
SFP000E013

Objectives

Material Required for Examination

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

Question Source Comments Vision Q60120 regarding when in service pump would lose suction

Comment

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

Question Topic RO 49

During a steam leak, the CRS directs the PO to FAST close 11MS167 from the 1CC3 bezel. The PO depresses the NORMAL close PB on 1CC2 instead, and the 11MS167 starts closing hydraulically.

Which choice describes what will happen if the operator then pushes the FAST close PB for 11MS167?

a. The vent valves11MS169 and 11MS171 immediately open, allowing hydraulic pressure to close valve against only atmospheric pressure.

b. The MSIV hydraulic pump immediately stops, depressurizing the hydraulic header, and allows main steam pressure to close the valve.

c. The hydraulic sequence will continue until the Valve Fully Closed (33CVO) contact is closed. All other operation of the valve is locked out until the hydraulic pump is deenergized.

d. A solenoid valve immediately opens, equalizing hydraulic pressure on both sides of the operating piston, and vent valves 11MS169 and 11MS171 open to allow main steam pressure to close the valve.

Answer d **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 039000G128 2.1.28 **RO Value:** 4.1 **SRO Value:** 4.1 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Main and Reheat Steam System 039

KA Statement: Knowledge of the purpose and function of major system components and controls.

Explanation of Answers: 55.41.b(4) Using Logic drawings 239916 and 239917: The Emergency Trip signal is generated from the (Fast) CLOSE PB, and acts just the same as a Safeguards Train MSLI or High Stm Line Flow SI signal. SV-1 closes (was open to direct hydraulic pressure to bottom of hydraulic piston.) SV-3 opens, equalizing hydraulic pressure on both sides of the hydraulic piston, and allows the hydraulic fluid to act as buffer to prevent 11MS167 from slamming closed. The solenoids for 11MS169 and 11MS171 open, venting air, and the valves open to allow MS pressure on the bottom of the lower operating piston to drive the disc up against atmospheric pressure. The hydraulic pump does immediately stop running.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Main Steam System Stop Valves Vent Valves	239916			7
Main Steam System 11MS167 Stop Valves Hyd	239917			12

L.O. Number
MSTEAME005

Objectives

Material Required for Examination

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

Question Source Comments Vision Q80671

Comment

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

Question Topic: RO 50

Given the following conditions:

- A Unit 2 plant startup is in progress.
- Reactor power is stable at 18%.
- The Main Generator is rolling unloaded at 1800 rpm.
- Main Steam Dumps are controlling in AUTO in MS Pressure control.

MS Dump Pressure setpoint is lowered 5 psig.

With no other operator action, several minutes later you will notice:

a. Reactor Power is <18%.

b. Reactor power is > 18%.

c. Control rods have stepped in.

d. Control rods have stepped out.

Answer: b **Exam Level**: R **Cognitive Level**: Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 039000K508 K5.08 **RO Value:** 3.6 **SRO Value:** 3.6 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Main and Reheat Steam System 039

KA Statement: Knowledge of the operational implications of the following concepts as they apply to the Main and Reheat Steam System:
Effect of steam removal on reactivity

Explanation of Answers: 55.41.b(5)With steam dumps open in MS pressure control auto, lowering the setpoint will cause steam dumps to open to reduce steam header pressure to setpoint pressure This will cause a higher steam flow and lower temperature, which causes higher Rx power. Control rods are not placed in auto until >P-2, which is 15% Turbine power, which is not online yet, so rods will be in manual and no operator action stated in stem.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision

L.O. Number
RXOPERE021

Objectives

Material Required for Examination

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

Question Source Comments: Vision Q67278 modified from rod pull to lowering MS dump setpoint.

Comment

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

Question Topic RO 51

Given the following conditions:

- Unit 1 is operating at 100% power when a Main Turbine trip causes a reactor trip.
- The Main Steam Dumps do NOT arm.

Which of the following describes the effect this failure to arm will have on the Reactor Coolant System over the next 5 minutes?

a. PZR PORVs will open to restore RCS pressure to 2235 psig.

b. RCS pressure will rise and PZR spray will keep pressure below 2335 psig.

c. RCS Tavg will stabilize at a temperature below 547°F based on reset curve of SG Safety Valves which have lifted.

d. RCS Tavg will stabilize at a temperature above 547°F based on 11-14MS10 operation in conjunction with at least one SG Safety Valve having opened.

Answer	b	Exam Level	R	Cognitive Level	Application	Facility:	Salem 1 & 2	ExamDate:	12/3/2012

KA:	041000K302	K3.02	RO Value:	3.8	SRO Value:	3.9	Section:	SYS	RO Group:	2	SRO Group:	2	55.43

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

KA Statement: Knowledge of the effect that a loss or malfunction of the Steam Dump System and Turbine Bypass Control will have on the following:
RCS

Explanation of Answers: 55.41.b(4,5,) With a reactor trip, core heat production will lower rapidly. The Steam Generator Atmospheric Reliefs, MS10s, will open to establish RCS temp ~551-552 °F. The RCS pressure will not rise enough to open the PORV's, much less the PZR Safeties, which are meant to relieve a loss of load with the Rx still at power. PZR Spray valves will open rapidly and fully as required to prevent PORV operation. The Tavg distracters will not occur as the Safeties will not open, and would reset well before lowering pressure <1005 psig (no load temp for 547°F)

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
PZR and PRT Lesson Plan	NOS05PZRPRT-06			6

L.O. Number
STDUMPE011

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 52

Of the following, choose the choice which contains ONLY actions that automatically occur on a Unit 2 Main Turbine trip from 100% power, with NO operator action.

I. Running EHC pumps trip
II. 500KV breakers 1-9 and 9-10 open.
III. Emergency Bearing Oil pumps start.
IV. 4KV Vital buses swap power supplies.
V. 4KV Group buses swap power supplies
VI. Main Generator Exciter Field Breaker opens.

a. I, II, III.

b. I, IV, VI.

c. II, V, VI.

d. III, IV, V.

Answer	c	**Exam Level**	R	**Cognitive Level**	Memory	**Facility:**	Salem 1 & 2	**ExamDate:**	12/3/2012

KA:	045000A311	A3.11	**RO Value:**	2.6*	**SRO Value:**	2.9*	**Section:**	SYS	**RO Group:**	2	**SRO Group:**	2	55.43

System/Evolution Title Main Turbine Generator System 045

KA Statement: Ability to monitor automatic operations of the Main Turbine Generator System including:
Generator trip

Explanation of Answers: 55.41.b(4) Running EHC pumps do not auto stop, but plausible because F-32 DEHC trip occurs on turbine trip. 1-9 and 9-10 are the Unit 2 Main Generator output breakers, and they open automatically on every turbine trip. Emergency bearing oil pumps do not start but plausible because aux bearing oil pump will start. 4 KV group buses are powered from APT when Main Generator is operating, an automatically swap to Station Power Transformers powered from off site power upon when the output breakers open. 4KV vital bus swap does not occur as vital buses are powered from off site source. Exciter Field breaker trips upon a Main Turbine trip

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Overhead Annunciators Windows F,G,H	S2.OP-AR.ZZ-0006,7,8			15,48,19
Generator Voltage regulator Exciter Field Break	601037			6

L.O. Number
MNTURBE006
EXCTR2E009

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 45% steady state power.
- All Heater Drain Pumps are O/S.
- All Steam Flows and Feed Flows are 40% and stable
- NI's indicate 45% on each channel and stable.
- RCS Tavg/Tref deviation is 0.0°F.

Which of the following is CLOSEST to the programmed value of SG Feed Delta-P IAW S2.OP-SO.CN-0002, Steam Generator Feed Pump Operation?

a. 50 psid.

b. 60 psid.

c. 80 psid.

d. 150 psid.

Answer c **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 059000A107 A1.07 **RO Value:** 2.5* **SRO Value:** 2.6* **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Main Feedwater System 059

KA Statement: Ability to predict and/or monitor changes in parameters associated with operating the Main Feedwater System controls including: Feed Pump speed, including normal control speed for ICS

Explanation of Answers: 55.41.b(4) SG Feed D/P (delta between feed pressure and SG pressure) is controlled by adjusting SGFP speed, and is programmed based on total % Steam Flow. Actual SGFP speed in rpm is only a result, not a controlled parameter. The K/A intent is met by asking how the feed pressure D/P is controlled, which itself controls SGFP speed. 50 is the minimum D/P from 0-15%. 150 psig is the 100% D/P. 60 psid is if candidate used linear scale from 0%-100% steam flow.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Steam Generator Feed Pump operation	S2.OP-SO.CN-0002	Exhibit 1	88	33

L.O. Number
CN&FDWE008

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

Which of the following identifies how over-cooling of the RCS is prevented on an uncomplicated manual Rx trip from 100% power?

a. P-10 actuates.

b. P-12 actuates.

c. Feedwater Isolation.

d. Feedwater Interlock.

Answer d **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 059000K105 K1.05 **RO Value:** 3.1* **SRO Value:** 3.2 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Main Feedwater System 059

KA Statement: Knowledge of the physical connections and/or cause-effect relationships between Main Feedwater System and the following: RCS

Explanation of Answers: 55.41.b(7)Feedwater interlock actuates when 3/4 RCS Tavgs <554°F and at least one Reactor Trip and associated bypass breaker open. This shuts the BF19's and BF40 Feed Reg Valves. Feedwater Isolation occurs when 2/3 SG NR levels on 1/4 SG's reaches 67% OR on a SI signal, and shuts BF19s, 40s, 13s, and trips the SGFPs. On an uncomplicated Rx trip this will not occur. P-10 is 3/4 PRNIs <10% power, and blocks the low power Rx trips. P-12 is 3/4 RCS Tavgs <543°F, and will shut the Steam Dump valves. On an uncomplicated trip, steam dumps will modulate to control Tavg at 547°, and temp will not reach 543

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Reactor Trip Response	2-EOP-TRIP-2	Basis Document	8	28

L.O. Number CN&FDWE006 **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 55

Given the following conditions:

- Salem Unit 2 is operating at 100% power.
- 21 AFW pump is C/T for pump oil bubbler repair.
- A 400 gpm tube rupture occurs on 23 SG.
- The Rx is tripped and a SI initiated successfully.
- 2A 4KV vital bus locks out on Bus Differential.

Which of the following describes how 23 AFW pump should be utilized IAW 2-EOP-SGTR-1, Steam Generator Tube Rupture?

a. Lower 23 AFW pump speed to minimum and trip 23 AFW pump regardless of MDAFW pump status to terminate the unmonitored radioactive release from its steam exhaust.

b. Lower 23 AFW pump speed to minimum and trip 23 AFW pump. Do not restart until 23MS45 23 SG TO AF PUMP TURB STOP VALVE is shut.

c. Continue running 23 AFW pump since 22 AFW pump will only be supplying feed to a single SG.

d. Continue running 23 AFW pump because it is the only source of feed flow to the SGs.

Answer b **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 061000K103 K1.03 **RO Value:** 3.5 **SRO Value:** 3.9 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Auxiliary / Emergency Feedwater System 061

KA Statement: Knowledge of the physical connections and/or cause-effect relationships between Auxiliary / Emergency Feedwater System and the following:

Main steam system

Explanation of Answers: 55.41.b(4,10,13) 23 Turbine Driven AFW pump is supplied from 21 and 23 Main steam lines. Each steam line has a tap upstream of the MSIV. Each line has its own isolation valve (21MS45 and 23MS45) and then its own check valve before the 2 lines combine into one line which feeds the TDAFW pump. During a SGTR, the TDAFW pump remains in service ONLY if it is the SOLE source of feed flow to the SG's. In the stem, 22 AFW pump will be running, since it is powered off of 2B 4KV vital bus, and it has received an auto start signal on SG level. A is incorrect but plausible because there IS an unmonitored release from 23 AFW pump since it exhausts directly to atmosphere, but is only secured if there is another source of feed. B is correct per Steps 4.4, 4.5, and 4.7 of SGTR-1, which state to lower speed and trip if it is not the sole source of feed, and to not restart until 23MS45 has been shut. C is incorrect because a single SG being fed is sufficient for heat sink status and 23 AFW pump will not continue to be run. D is incorrect because 22 AFW pump is powered from 2B 4KV vital bus and it remains energized. 21 AFW pump is powered from 2A 4KV vital bus which was lost.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Steam Generator Tube Rupture	2-EOP-SGTR-1			27
Unit 2 Main Steam	205303 Sheet 1	Grid G-3 and C-3		67

L.O. Number | Objectives

SGTR01E009

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 has tripped from 100% power from a faulty SSPS relay on the unaffected train during SSPS testing.
- No Safety Injection has occurred or is required.

Which of the following describes the effect if 21 AFW pump fails to start?

a. Operator action to throttle the 21-24AF11, S/G LEVEL CONTROL VALVES, will be directed to prevent overfeeding the SGs, since 23 AFW pump speed will NOT be lowered to minimum speed unless BOTH AFW pumps are running in EOP-TRIP-2, Rx Trip Response.

b. Operator action to throttle the 21-24AF11, S/G LEVEL CONTROL VALVES, will be directed to prevent overfeeding the SGs, since 23 AFW pump will NOT be secured unless BOTH AFW pumps are running in EOP-TRIP-1 Rx Trip or Safety Injection.

c. 21 and 22 SGs will receive more AFW flow than 23 and 24 SGs. With NO operator action, a Steamline D/P Safety Injection will actuate 21 / 22 SG pressures lower.

d. 23 and 24 SGs will receive more AFW flow than 21 and 22 SGs. With NO operator action, a Steamline D/P Safety Injection will actuate 23 / 24 SG pressures lower.

Answer a **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 061000K302 K3.02 **RO Value:** 4.2 **SRO Value:** 4.4 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Auxiliary / Emergency Feedwater System 061

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

Explanation of Answers: 55.41.b(4) 21 MDAFW pump supplies AFW flow to 23 and 24 SG. 23 TDAFW pp supplies all 4 SGs. Following a Rx trip, operators will transition to TRIP-2 after the Immediate Actions of TRIP-1 are performed and a SI is not required. After stopping the SGFPs in TRIP-2, step 3, 23 AFW pp speed is lowered to minimum or 22E4 lbm/hr. Since there would be no flow to 23 and 24 SGs if speed was lowered to minimum, operators will throttle the AF11s to balance flow to each of the SGs and maintain levels and pressures approximate. C and D are incorrect because overfeeding will NOT occur since operators are directed to lower AFW flow. B is incorrect because operators will have transitioned to TRIP-2.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Reactor Trip Response	2-EOP-TRIP-2			28

L.O. Number

AFW000E015

Objectives

Material Required for Examination

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

Question Source Comments Vision Q134732. Used on Salem 07-01 NRC RO exam.(Q52, 3 exams ago)

Comment

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

Question Topic RO 57

Which of the following describes how control room instrumentation will be affected if the 1C Vital Instrument Bus (VIB) Inverter were to experience a latched transfer?

Instrumentation powered from 1C VIB…

a. will be unaffected by the transfer since it occurs in milli-seconds.

b. must be declared INOPERABLE until the VIB inverter is restored to its normal power supply.

c. will indicate flashing low during the transfer (1-2 seconds), but return to full functional status.

d. AND 1D VIB will momentarily be lost during the transfer since their inverters are powered from the same 230 VAC source.

Answer a **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 062000A103 A1.03 **RO Value:** 2.5 **SRO Value:** 2.8 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title A.C. Electrical Distribution 062

KA Statement: Ability to predict and/or monitor changes in parameters associated with operating the A.C. Electrical Distribution controls including: Effect on instrumentation and controls of switching power supplies

Explanation of Answers: 55.41.b(7) B is incorrect because the VIB, and the instrumentation powered from it, remain OPERABLE as long as the inverter is powering the Vital Bus. (P&L 3.5) The transfer of a VIB inverter takes 2/3 of 1 cycle, which is 11.1 milli seconds, which will not give enough time for the lights to respond on the instrumentation. D is incorrect because indication won't be lost, and 1D VIB is powered from 1B bus.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
1C Vital Instrument Bus UPS System Operation	S1.OP-SO.115-0013			9
Overhead Annunciator Window B	S1.OP-AR.ZZ-0002			28

L.O. Number Objectives

115VACE004

115VACE005

Material Required for Examination

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

Question Source Comments Vision Q111931

Comment

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

Question Topic RO 58

Choose the one component below which does NOT receive power from the Unit 1 Vital 125 VDC system.

a. 1D Vital Instrument Bus Inverter.

b. 1H 4KV Group Bus control power.

c. Gland Sealing Steam Annunciator Panel Alarms.

d. Supervisory Control and Data Acquisition (SCADA) System.

Answer d **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 063000K201 K2.01 **RO Value:** 2.9* **SRO Value:** 3.1* **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title D.C. Electrical Distribution 063

KA Statement: Knowledge of bus power supplies to the following:
Major dc loads

Explanation of Answers: 55.41.b(4) The SCADA system is powered from the Circ Water 125 VDC system, not the vital 125VDC system. All the distracters are powered from the 125 VDC vital buses. 1D Vital Instrument Bus Inverter receives power from 1B 125 VDC bus. The 1H 4KV Group Bus receives its control power from 1A 125 VDC bus (reg) and 1B 125 VDC (emerg). The Gland Sealing Steam panel recieves power from the 1ADC Distribution Cabinet.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
No. 1 Unit 125 VDC One Line	203007			7
DC Electrical Systems Lesson Plan	NOS05DEELEC-07			7

L.O. Number
DCELECE007

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 59

Which of the following describes the Design Basis for the capacity of the EDG Diesel Fuel Oil Storage Tanks (DFOSTs) following a LOCA coincident with a LOOP?

_____ DFOST(s) are / is designed to supply _____ EDGs continuously for 4.5 days.

a. EACH; TWO.

b. EACH; THREE.

c. The COMBINED volume of BOTH; TWO

d. The COMBINED volume of BOTH; THREE.

Answer: c **Exam Level**: R **Cognitive Level**: Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 064000K103 K1.03 **RO Value:** 3.6 **SRO Value:** 4.0 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Emergency Diesel Generators 064

KA Statement: Knowledge of the physical connections and/or cause-effect relationships between Emergency Diesel Generators and the following: Diesel fuel oil supply system

Explanation of Answers: 55.41.b(8) Salem FSAR states....The combined volume of both 30,000 gallon fuel oil storage tanks contains sufficient fuel oil at the Technical Specification minimum volume to supply two diesel generators, operating at the most limiting accident mitigation profile for LOCA with loss of offsite power, for approximately 4.5 days."

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem UFSAR		Section 9.5.4	9.5-40	16

L.O. Number
EDG000E004
EDG000E002

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 60

If a leak were to develop on 21 RHR pump room cooler, which of the following tanks would show rising level because of the leak?

a. Auxiliary Building Sump Tank.

b. In-service Waste Hold Up Tank.

c. In-service CVCS Hold Up Tank.

d. Laundry, Hot Shower, and Chemical Drain Tank.

Answer b **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 068000K107 K1.07 **RO Value:** 2.7 **SRO Value:** 2.9 **Section:** SYS **RO Group:** 2 **SRO Group:** 2 55.43

System/Evolution Title Liquid Radwaste System 068

KA Statement: Knowledge of the physical connections and/or cause-effect relationships between Liquid Radwaste System and the following: Sources of liquid wastes for LRS

Explanation of Answers: 55.41.b(13) RHR pump rooms each have a sump for receiving drains and leakage in the room. Each RHR pump room sump is pumped to the inservice Waste Hold up Tank. A is incorrect because the Aux Building sump tank collects floor drains from locations above it, and it is located on 64'. C is incorrect because the CVCS HUT system receives influent which can be processed and recovered as CVCS quality water, not floor drains. D is incorrect because Laundry and Hot Shower drain collection points are provided for the contaminated laundry, showers, and sink utilized for protective clothing and personnel decontamination.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Floor Drains - Contaminated	205326 Sheet 2			26
Waste Disposal Liquid	205339 Sheet 2			37

L.O. Number

WASLIQE004

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 61

Given the following conditions:

- Salem Unit 1 is operating at 100% power, with no equipment out of service.
- Salem Unit 2 is in MODE 5, during a return from a refueling outage.
- Unit 2 is performing a normal Liquid Release from 21 CVCS Monitor Tank via 22 SW header to Unit 1 CW IAW S2.OP-SO.WL-0001, Release of Radioactive Liquid Waste from 21 CVCS monitor Tank.
- The Radwaste Overboard Discharge Flow Recorder 2FR-1064 is OPERABLE.
- The 2R18 Liquid Waste Disposal and the 2R41D Plant Vent Release Rate monitors are OPERABLE.
- After commencing the release, the field operator is recording the Initial Release Data.
- When recording the 2R18 reading, it reads 10 E6 cps.
- The 2R18 red alarm light is lit on the 104 panel.
- The 2WL51 Liquid Release Stop Valve indicates OPEN in the control room.

Which of the following describes what these indications mean, and how the operating crew should proceed?

a. The 2R18 is reading below the actual alarm setpoint. Continue with the liquid release and reset the alarm light at the 104 Panel.

b. With the 2FR-1064 and 2R41D OPERABLE, block the 2R18 input to the 2WL51 on 2RP1 prior to the time delay timing out and continue the liquid release.

c. The 2WL51 should have immediately automatically closed on the 2R18 high radiation alarm. The NCO in the control room should shut 2WL51.

d. The 2WL51 should have immediately automatically closed on the 2R18 high radiation alarm. The NEO should shut 2WL51 locally.

Answer c | **Exam Level** R | **Cognitive Level** Application | **Facility:** Salem 1 & 2 | **ExamDate:** 12/3/2012

KA: 073000K301 | K3.01 | **RO Value:** 3.6 | **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 effect that a loss or malfunction of the Process Radiation Monitoring System will have on the following: Radioactive effluent releases

Explanation of Answers: 55.41.b(13) 6.82E5 cps is the ALARM setpoint which will automatically shut the 2WL51 (S2.IC-CC.RM-0028). The current reading is above the setpoint at which the 2WL51 should have automatically shut, and the NCO should shut the valve remotely. The red alarm light for high radiation indicates the 2WL51 should have shut, memorization of alarm setpoint is not necessary. Additionally, S2.OP-SO.WL-0001 for releasing the tank, Step 5.5.9, says if the 2R18 alarms, then the NEO is to inform the NCO to shut the 2WL51. There is no provision for closing the valve locally. There is no time delay for 2WL51 closure, nor is there any provision for releasing a hot tank or is there an expected spike.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Release of Radioactive Liquid Waste	S2.OP-SO.WL-0001			25
2R18 Liquid Waste Disposal Process Radiation	S2.IC-CC.RM-0028			14

L.O. Number
RMS000E005

Objectives

Material Required for Examination	

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

Question Source Comments	Vision Q83676 modified to provide more info in stem about operable equipment and made answers more homogenous.

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 is operating at 100% power steady state.
- A field operator reports a SW leak in 2C EDG room, just upstream of 23SW39, 2C DIESEL CLG SW VLV.
- The RO reports Service Water pressure on both 21 and 22 headers has lowered from 112 to 101 psig and continues to lower.

Which of the following describes the expected SW system response, and how the operating crew will respond IAW S2.OP-AB.SW-0001, Loss of Service Water Header Pressure?

Assume SW header pressure can be restored.

The standby SW pump will start when SW header pressure lowers to…

a. 95.5 psig. Lock out 2C EDG and declare it INOPERABLE, shut 21SW21 AND 22SW21, DIESEL CLG SW INLET VALVES, to isolate the leak.

b. 99.5 psig. Lock out 2C EDG and declare it INOPERABLE, shut 21SW21 AND 22SW21, DIESEL CLG SW INLET VALVES, to isolate the leak.

c. 95.5 psig. Lock out 2C EDG and declare it INOPERABLE, isolate the leak by shutting 21SW37 AND 22SW37, 2C DIESEL CLG SW INLET VALVES.

d. 99.5 psig. Lock out 2C EDG and declare it INOPERABLE, isolate the leak by shutting 21SW37 AND 22SW37, 2C DIESEL CLG SW INLET VALVES.

Answer c **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 076000A202 A2.02 **RO Value:** 2.7 **SRO Value:** 3.1 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Service Water System 076

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

Service water header pressure

Explanation of Answers: 55.41.b(7, 10)Lock out the EDG(s) that will be affected and isolate the leak. Step 3.11 has operators isolate the leak. EDG must be locked out to prevent starting with no SW available. The only way to isolate the leak is to isolate both supplies from both SW headers by closing both SW37's. Cannot isolate both SW21s per Att 4 , Steps 4.0 B and C because it would render ALL EDGs inoperable. OHA for SW header pressure low states auto start for standby SW pumps is 95.5 psig.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Service Water Header Pressure	S2.OP-AB.SW-0001			16
Overhead Annunciators Window B	S2.OP-AR.ZZ-0002		28	35

L.O. Number

ABSW01E004

Objectives

Material Required for Examination	

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

Question Source Comments	Vision Q77578. Changed from what to do to isolate leak (4 choices) to what pressure auto pump will start and how to isolate (made into a "2 and 2" question.

Comment

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

Question Topic: RO 63

Which of the following identifies normal Control Air header pressure, and the pressure at which the Emergency Air Compressor will automatically start?

a. 100 psig; 85 psig.

b. 110 psig; 90 psig.

c. 100 psig; 90 psig.

d. 110 psig; 85 psig.

Answer: a **Exam Level**: R **Cognitive Level**: Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 078000A301 A3.01 **RO Value:** 3.1 **SRO Value:** 3.2 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title: Instrument Air System 078

KA Statement: Ability to monitor automatic operations of the Instrument Air System including:
Air pressure

Explanation of Answers: 55.41.b(7) AB.CA Basis Document states…"When supplied from SA through the dryers, CA pressure runs approximately 5 psig below SA pressure. CA pressure cycles along with the SA cycle. Thus, CA pressures normally run between 95 and 105 psig.The Emergency Control Air Compressor (ECAC), should auto start if CA pressure drops to 85 psig.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Control Air System Operation	S2.OP-SO.CA-0001		3	14
Loss of Control Air	S2.OP-AB.CA-0001	Basis Document	6-7	

L.O. Number: CONAIRE008

Objectives

Material Required for Examination

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

Question Source Comments: Vision Q42094 changed to normal pressure and auto start pressure, from a what starts the ECAC.

Comment

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

Question Topic RO 64

Given the following conditions:

- Unit 2 is operating at 100% power when the following occurs:
- OHA A-7, FIRE PROT FIRE.
- 2RP5 Fire Protection Panel, Zone 148 - Work Control Ops Ready Room lamp illuminates, as does the FIRE lamp for that row of alarms.
- The audible coded fire alarm is broadcast over the plant PA system.

For these conditions, which of the following identifies:
1. What these indications mean.
2. How the 2RP5 Fire Protection Panel is reset when the condition has cleared.

a. An active fire suppression system (water/CO2/Halon) has activated. Reset from the Control Room.

b. An active fire suppression system (water/CO2/Halon) has activated. Reset from the Relay Room.

c. A Fire alarm (smoke or heat) has activated. Reset from the Control Room.

d. A Fire alarm (smoke or heat) has activated. Reset from the Relay Room.

Answer	d	**Exam Level**	R	**Cognitive Level**	Application	**Facility:**	Salem 1 & 2	**ExamDate:**	12/3/2012

KA:	086000A402	A4.02	**RO Value:**	3.5	**SRO Value:**	3.5	**Section:**	SYS	**RO Group:**	2	**SRO Group:**	2	55.43

System/Evolution Title Fire Protection System | 086

KA Statement: Ability to manually operate and/or monitor in the control room:
Fire detection panels

Explanation of Answers: 55.41.b(4) 1)Early warning detectors provide the Control Room with early indication of fire, but do not cause a suppression system to actuate. Early warning Smoke Detectors and Fire Detectors installed in the plant are arranged to alarm to the Control Room by zone.a) If a detector on a zone actuates, the zone indicating light on Panel RP5 will illuminate along with the appropriate group "FIRE" light, and the coded fire alarm assigned to the zone will be broadcast over the station PA system.
Once a zone actuates, the alarm remains illuminated until the zone is manually reset from the fire protection panels in the Relay Room.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Fire Protection System Lesson Plan	NOS05FIREPRO-07		31-32	7

L.O. Number
FIRPROE008

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:

- Operators are performing a Unit 2 Containment Vacuum Relief IAW S2.OP-SO.CBV-0002, Containment Pressure - Vacuum Relief System Operation.
- 2VC5 and 2VC6 CONT VENT ISO DAMPERS are open.
- The Vacuum Relief Damper is open.

A valid Containment Ventilation Isolation signal from the RMS system occurs.

Which of the following identifies how this will affect the Containment Vacuum Relief in progress?

a. ONLY 2VC5 and 2VC6 will shut.

b. ONLY the Vacuum Relief Damper will shut.

c. 2VC5, 2VC6, and the Vacuum Relief Damper will shut.

d. 2VC5, 2VC6, and the Vacuum Relief Damper remain open (CVI blocked during Vacuum Relief).

Answer c **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 103000A409 A4.09 **RO Value:** 3.1* **SRO Value:** 3.7* **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Containment System 103

KA Statement: Ability to manually operate and/or monitor in the control room:
Containment vacuum system

Explanation of Answers: 55.41.b(11) RMS initiated CVI signals close the VC1,4,5,6 and the Pressure Relief and Vacuum Relief Dampers. The CVI can be blocked if present to allow the commencement of the relief, but is NOT present in initial conditions in stem until it occurs after vacuum relief has been started

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Containment Pressure-Vacuum Relief System	S1.OP-SO.CBV-0002		99-101	21
CONTAINMENT AND CONTAINMENT SUPPO	NOS05CONTMT-11			11

L.O. Number Objectives

CONTMTE007

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 66

The purpose of the Reactor Coolant Pump (RCP) Thermal Barrier is to...

a. limit loss of reactor coolant up the RCP shaft if the seal package fails.

b. cool seal injection flow to prevent overheating of the #1 seal.

c. protect the radial bearing and seals from the heat of the RCS.

d. protect the thrust bearing from damage due to excessive heat.

Answer c **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 194001G128 2.1.28 **RO Value:** 4.1 **SRO Value:** 4.1 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title GENERI

KA Statement:

Knowledge of the purpose and function of major system components and controls.

Explanation of Answers:

55.41.b.(3) The RCP thermal barrier prevents hot reactor coolant from flowing up the shaft to the radial bearing and RCP seal package when normal seal injection flow is lost. The normal flow of cool seal injection water past the radial barrier into the RCS normally performs that function. In the event of a loss of seal injection flow, reactor coolant would flow up across the tubes of the heat exchanger(cooled by CCW) and into the pump to provide the coolant and lubricant for the radial bearing and seals. A is incorrect because the thermal barrier is not designed as a flow limiter. B is incorrect because ther Thermal Barrier does not cool seal injection flow. D is incorrect because the thrust bearing is not in the controlled leakage seal package

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Reactor Coolant Pump Lesson Plan	NOS05RCPUMP-10		17	10

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 Q43989 made psychometrically balanced.

Comment

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

Question Topic RO 67

Which of the following conditions will REQUIRE the suspension of fuel movement in the Unit 2 Rx vessel?

a. Chemistry reports Rx Cavity boron concentration is 2499 ppm.

b. A NEO reports BOTH 100' elevation containment airlock doors are open.

c. The PO depresses Fire Outside Control Room on Unit 2 Control Area Ventilation.

d. Containment Radiation Monitor 2R12A fails causing a Containment Ventilation Isolation signal.

Answer	c	**Exam Level**	R	**Cognitive Level**	Application	**Facility:**	Salem 1 & 2	**ExamDate:**	12/3/2012

KA:	194001G140	2.1.40	**RO Value:**	2.8	**SRO Value:**	3.9	**Section:**	PWG	**RO Group:**	1	**SRO Group:**	1

55.43

System/Evolution Title GENERI

KA Statement:

Knowledge of refueling administrative requirements.

Explanation of Answers:

55.41.b(11) C is correct because operation in the recirculation mode requires suspension of fuel movement. (SO.CAV P&L 3.6.3 When aligned to FIRE OUTSIDE CONTROL AREA (Recirculation Mode),Core Alterations and movement of irradiated fuel is NOT permitted (T/S Bases 3/4.7.6)). D is incorrect because Containment Radiation monitors are not required to be operable for Mode 6 or Fuel Movement or Core Alts per Tech Specs. B is incorrect because the airlock doors are only required to be CAPABLE of being shut, and can be open (S2.OP-ST.CAN-0007, page 8). A is incorrect because the COLR limit for boron concentration is 2139

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem Tech Specs				
Refueling Operations-Containment Closure	S2.OP-ST.CAN-0007			27
Control Area Ventilation Operation	S2.OP-SO.CAV-0001			

L.O. Number

REFUELE012

Objectives

Material Required for Examination

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

Question Source Comments Vision Q110741

Comment

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

Question Topic RO 68

When performing a Surveillance Procedure, the operator encounters a step which has a "$" under the line where the operator initals completion of that step.

What is the significance of the "$" sign?

a. It identifies an item required to meet Salem UFSAR acceptance criteria, which if not satisfactorily completed should be brought to the attention of the SM/CRS upon completion of the surveillance.

b. It identifies an item required to meet Technical Specification acceptance criteria, which if not satisfactorily completed should be brought to the immediate attention of the SM/CRS.

c. It identifies a step which requires Independent Verification of its completion PRIOR to continuing to the next step.

d. It identifies a step which requires direct oversight by an assigned Reactivity Management SRO.

Answer b **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 194001G212 2.2.12 **RO Value:** 3.7 **SRO Value:** 4.1 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title GENERI

KA Statement:

Knowledge of surveillance procedures.

Explanation of Answers:

55.41.b(10) Each surveillance procedure which contains $ signs contains a Precaution and Limitation which states…"Steps identified with a dollar sign ($) are those items required to meet Technical Specification acceptance criteria. Such steps, if not satisfactorily completed, may have reportability requirements and should be brought to the immediate attention of the SM/CRS." The procedure writers guide also states" Step 4.5.4 DESIGNATE Technical Specification and UFSAR acceptance criteria as follows:- Technical Specification, use a dollar sign ($) or the Technical Specification number at the step where the value is given or where verification for that value is checked. - UFSAR, use a cent symbol (¢) or the UFSAR number at the step where the value is given or where verification for that value is checked.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
IMPLEMENTING PROCEDURE WRITERS GUI	AD-AA-101-1003		29	2

L.O. Number

SURV00E006

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 69

Given the following conditions:

- Unit 2 is operating at 100% power.
- Excess Letdown is in service due to a problem with the control circuit for 2CV35, VCT 3 WAY INLET V.
- I&C troubleshooting is in progress on 2CV35.
- The RO reports that 2CV35 has just swapped to the Flow to HUT position.
- The RO also reports that during the pre-job brief for the 2CV35 troubleshooting, it was stated that 2CV35 actual position would NOT be affected during the troubleshooting.

Which of the following identifies the FIRST action the crew should take?

a. Enter S2.OP-AB.CVC-0001, Loss of Charging to address the unanticipated CVCS system lineup.

b. Contact the WCC to initiate a tagout for 2CV35 since the troubleshooting needs to have the valve deactivated.

c. Contact the I&C Supervisor and stop work on 2CV35 based on being outside of Procedures, Parameters or Processes (OOPS) IAW HU-AA-101, Human Error Prevention.

d. Have the RO place 2CV35 in the Auto position to maintain status control since the Component Off Normal and Off Normal Tagged report does not reflect the valves current position.

Answer c **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 194001G220 2.2.20 **RO Value:** 2.6 **SRO Value:** 3.8 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title GENERI

KA Statement: Knowledge of the process for managing troubleshooting activities.

Explanation of Answers: 55.41.b(10) Excess letdown does not flow through 2CV35, so its movement will not affect RCS letdown, and AB.CVC-1 will not address the valve movement. While a tagout may need to be initiated, it would not happen without stopping the job in progress and finding out in more detail from I&C how the valve could be affected and what the blocking points needed to be. OOPS requires stopping the job because they system realignment was stated to NOT going to occur during troubleshooting. Status control does not require movement of components just to align with the Off Normal, the Off Normal position would be updated in SAP

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
HUMAN PERFORMANCE TOOLS AND VERIFI	HU-AA-101			8

L.O. Number

MISCAP007

Objectives

Material Required for Examination

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

Question Source Comments Vision Q125707

Comment

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

Question Topic RO 70

The Unit 2 control room receives a call from the Rad Waste Operator, who states that an isolated Gas Decay Tank in hold-up has lowered in pressure from 90 psig to 40 psig over the last 2 hours, and continues to lower slowly.

Which of the following would provide confirmation that tank pressure has lowered (vs instrument failure), and why is confirmation important?

a. Display the 2R41D trend reading on 2RP1. An unapproved release may be in progress.

b. Display the 2R41D trend reading on 2RP1. An unmonitored release may be in progress.

c. Direct Rad Pro to locally retrieve trend data for the Area Monitor closest to the GDT area. An unapproved release may be in progress.

d. Direct Rad Pro to locally retrieve trend data for the Area Monitor closest to the GDT area. An unmonitored release may be in progress.

Answer a **Exam Level** R **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 194001G244 2.2.44 **RO Value:** 4.2 **SRO Value:** 4.4 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title GENERI

KA Statement:

Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.

Explanation of Answers:

55.41.b(11) R41 (plant vent) monitors in control room have trend function which can display historical data. If a release is in progress it's being monitored, but is unapproved. Area Monitors do not have trend functions locally, but some of them are trended on P-250 computer (R4 and R34)in control room.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Radiation Monitoring System Operation	S2.OP-SO.RM-0001			37

L.O. Number RMS000E007

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 71

Given the following conditions:

- Unit 2 is operating at 100% power.
- 2R19A, STM GEN BLOWDOWN RAD MONITOR, rises to the ALARM setpoint and continues to rise.

Which of the following describes how the 21-24GB4s, SG B/D OUTLET ISOL VALVES respond, and why?

a. ONLY 21GB4 shuts to minimize the spread of contamination from a Steam Generator Tube Rupture (SGTR) on 21 Steam Generator to secondary systems.

b. 21-24GB4s shut to minimize the spread of contamination from a Steam Generator Tube Rupture (SGTR) on 21 Steam Generator to secondary systems.

c. ONLY 21GB4 shuts to prevent cross contamination from 21 Steam Generator to any other Steam Generator through the unaffected Steam Generators blowdown lines.

d. 21-24GB4s shut to prevent cross contamination from 21 Steam Generator to any other Steam Generator through the unaffected Steam Generators blowdown lines.

Answer a **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

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(11) B is incorrect because only the affected GB4 is automatically shut on the Hi Rad Alarm, it is plausible because ALL GB10s, GB185s, and 2GB50 shut on Hi Rad WARNING. Isolating the blowdown path from the S/G to the condenser will prevent the spread of contamination, and also will prevent any type of release from the main condenser to atmosphere. Each S/G has its own blowdown line, so backfeeding contamination is not possible through the blowdown lines.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Radiation Monitoring System Operation	S2.OP-SO.RM-0001			37

L.O. Number
ABSG01E003

Objectives

Material Required for Examination

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

Question Source Comments Q78166 modified to make a 2 and 2 vs just a why do we isolate blowdown

Comment

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

Question Topic RO 72

Which of the following Area Radiation Monitors is one that is checked in 2-EOP-LOCA-1, Loss of Reactor Coolant, when determining if a LOCA outside Unit 2 containment is occurring?

a. 2R10A, Personnel Hatch Containment 100'.

b. 2R34, Mechanical Penetration 100'.

c. 2R47, Electrical Penetration.

d. 2R52, Liquid PASS Room.

Answer b **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 194001G315 2.3.15 **RO Value:** 2.9 **SRO Value:** 3.1 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title GENERI

KA Statement: Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.

Explanation of Answers: 55.41.b(11) LOCA-1, step 16, checks for radiation outside containment by looking at 2R4, charging pump area, 2R41D plant vent process, 2R34, 1R3 Radio Chem lab area, 1R6A Sampling room, 1R20B counting room.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of Reactor Coolant	2-EOP-LOCA-1			28
S2.OP-SO.RM-0001	Radiation Monitoring System Oper	Attachment 1	32-34	37

L.O. Number | Objectives

RMS000E006

LOCA01E007

LOCA06E003

Material Required for Examination

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

Question Source Comments Vision Q125697, replaced distracter with 2R10A (used to assist in determining LOCA is occurring IN cont, not outside.

Comment

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

Question Topic RO 73

Given the following:

- The unit has been tripped and Safety Injection initiated due to a LOCA.
- The STA observes a PURPLE path displayed by SPDS for the CORE COOLING Status Tree, with no other RED or PURPLE paths on SPDS.
- The SMM is blinking dashes on both channels.
- SPDS is displaying question marks for all CET's.
- Plant Computer CET indication shows all CET's between 50-60°F.
- Local CET Display is unavailable.

Which of the following identifies how RCS saturation temperature will be determined IAW 2-EOP-CFST-1, Critical Safety Function Status Trees?

Wide Range RCS Thot and…

a. RCS pressure (PI-403 or PI-405) will be used in conjunction with Steam Tables.

b. RCS pressure (PI-403 or PI-405) will be used in conjunction with CFST Subcooling Tables.

c. PZR pressure channels (PI-455A, 456, 457 or 474A) will be used in conjunction with Steam Tables.

d. PZR pressure channels (PI-455A, 456, 457 or 474A) will be used in conjunction with CFST Subcooling Tables.

Answer b **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 194001G403 2.4.3 **RO Value:** 3.7 **SRO Value:** 3.9 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title GENERI

KA Statement:

Ability to identify post-accident instrumentation.

Explanation of Answers:

55.41.b(7,10) EOP-CFST Basis Document, page 2 of 18, "The SMM should be used to determine RCS subcooling. If the SMM is inoperable, then calculate and log RCS subcooling on Table D. The value of T-Sat is obtained by using Table A for Normal Containment or Table B for Adverse Containment." Table D footnote states..."*RCS temperature- Use CET's (WR Thot RTD's if CET's are not available)."

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Critical Safety Function Status Trees	2-EOP-CFST-1			

L.O. Number

LOCA01E008

Objectives

Material Required for Examination

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

Question Source Comments Vision Q81104. Used stem and expanded answer required from generic "what to do next" to how to determine RCS saturation temp.

Comment

Similar to DC Cook 4/29/2004 NRC Exam question.

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

Question Topic RO 74

When operating in the EOP network, which of the following describes conditional operator actions, including interprocedure transitions, that are applicable at all times while the procedure is being implemented?

a. Conditional Action Step.

b. Continuous Action Step.

c. Conditional Action Summary.

d. Continuous Action Summary.

Answer d **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 194001G419 2.4.19 **RO Value:** 3.4 **SRO Value:** 4.1 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title GENERI

KA Statement:

Knowledge of EOP layout, symbols, and icons.

Explanation of Answers:

55.41.b(10)4. EOPs have a Continuous Action Summary (CAS) in the upper left corner of each flowchart sheet. The continuous action summary contains conditional operator actions, including interprocedure transitions, that are applicable at all times while the procedure is being implemented.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
EMERGENCY/ABNORMAL OPERATING PRO	OP-SA-108-101-2000		28	0
REACTOR TRIP OR SAFETY INJECTION AND	NOS05TRP001-007		17	7

L.O. Number

TRP001E001

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 75

In which one of the following Unit 2 procedures are the Emergency Diesel Generator FIRE EMERGENCY BYPASS Keylock switches directed to be placed in BYPASS?

a. S2.OP-AB.FIRE-0001, Control Room Fire Response.

b. S2.OP-AB.FIRE-0002, Fire Damage Mitigation.

c. S2.OP-AB.CR-0001, Control Room Evacuation.

d. S2.OP-AB.CR-0002, Control Room Evacuation Due to Fire in the Control Room, Relay Room, 460/230V Switchgear Room, or 4KV Switchgear Room.

Answer d **Exam Level** R **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

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: 55.41.b(10) AB.CR-2, Attachment 4, Reactor Operator, pages 15, 19, and 22 place the keylock switches in bypass. The 3 distracters do not contain steps to perform this action. The bypass switches remove the SEC control from the EDG control, and are only operated when the control room has been evacuated due to a fire and SEC operation may be aberrant.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Control Room Evacuation Due to Fire in the Con	S2.OP-AB.CR-0002	Attachment 4	15,19,22	27

L.O. Number Objectives

ABCR02E003

Material Required for Examination

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

Question Source Comments

Comment

U.S. Nuclear Regulatory Commission
Site-Specific
Written Examination

Key

Applicant Information

Name:	Region: I
Date: 12/3/2012	Facility: Salem 1 & 2
License Level: SRO	Reactor Type: W
Start Time:	Finish Time:

Instructions

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

Applicant Certification

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

____
Applicant's Signature

Results

RO/SRO-Only/Total Examination Values	____ / ____ / ____	Points
Applicant's Score	____ / ____ / ____	Points
Applicant's Grade	____ / ____ / ____	Percent

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

Question Topic SRO 1

Given the following conditions:

- Unit 2 has performed a rapid downpower from 60% to 8% during a period of high Circ Water grassing.
- Control rods remain in automatic.
- The Main Turbine remains online.
- Control rods begin to withdraw in automatic.
- Rod speed is 16 spm with Tavg at 545°F.

Which of the following describes how should the CRS respond?

a. Enter S2.OP-AB.ROD-0003, Continuous Rod Motion, because control rod speed is higher than expected. Place control rods in manual and adjust Main Turbine load as necessary to return Tavg to within 1.5°F of program.

b. Enter S2.OP-AB.ROD-0003, because control rods should not be withdrawing. Place control rods in manual and adjust as necessary to return Tavg to within 1.5°F of program.

c. Lower turbine load to restore Tavg to within 1.0°F of program IAW S2.OP-AB.LOAD-0001, Rapid Load Reduction.

d. Trip the Main Turbine IAW S2.OP-AB.LOAD-0001.

Answer b **Exam Level** S **Cognitive Level** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 000001A203 AA2.03 **RO Value:** 4.5 **SRO Value:** 4.8 **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:
Proper actions to be taken if automatic safety functions have not taken place

Explanation of Answers: 55.43(2) Rod control would normally be placed in manual upon reaching 20% power in AB.LOAD. The stem states that is has nOT been placed in manual. Permissive P-2 actuates at <15% turbine laod, and prevents automatic rod withdrawal. Control rods should NOT b.e withdrawing. A is incorrect. Even if rod speed higher than expected (expected should be zero and its not), the action is incorrect because ROD-3 says to adjust control rods to restore Tavg, not adjust turbine load. B is correct. C and D are incorrect because the rod withdrawal is unexpected, and should be addressed with the abnormal rod withdrawl procedure, not the load reduction procedure. Additionally, taking actions to adjust or trip trip the turbine do not address the rod failure.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Continuous Rod Withdrawal	S2.OP-AB.ROD-0003			21
Rapid Load Reduction	S2.OP-AB.LOAD-0001			17

L.O. Number
ABROD3E002
RXPROTE013

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 was operating at 100% power, EOL.
- A 70 gpm RCS leak in containment was identified.
- Operators tripped the Rx and initiated a Safety Injection IAW S1.OP-AB.RC-0001, Reactor Coolant System Leak.
- While performing EOP-TRIP-1, Rx Trip or Safety Injection, Step 23, PZR PORV STATUS, the RO reports that PZR PORV 2PR1 indicates open.
- The RO reports 2PR1 will not manually shut.
- The RO reports that 2PR6 PZR PORV Block Valve will not shut.

Which of the following identifies how the CRS should proceed?

a. Continue in TRIP-1. The combined size of the PZR PORV and RCS leaks will allow a transition to TRIP-3, Safety Injection Termination.

b. Continue in TRIP-1. A transition to LOCA-1, Loss of Reactor Coolant will be made based on rising containment radiation monitors.

c. Transition to LOCA-1. A transition to TRIP-3 will be made after PZR PORV status is checked again in LOCA-1.

d. Transition to LOCA-1. SI Termination criteria cannot be met with either PORV not fully shut.

Answer: c **Exam Level:** S **Cognitive Level:** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 000007G120 2.1.20 **RO Value:** 4.6 **SRO Value:** 4.6 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43 ☑

System/Evolution Title: Reactor Trip 007

KA Statement:

Ability to interpret and execute procedure steps.

Explanation of Answers:

55.43.(5) A 70 gpm leak would require SI as stated in the stem, but charging pump flow would be able to maintain both PZR level and RCS pressure. If a PORV is open in TRIP-1 and it or its block valve cannot be shut, a transition is made to LOCA-1 because the EOP doesn't know how big the PORV leak is. Once in LOCA-1, there are steps redundant to those performed in TRIP-1 to attempt to close the PORV or its block valve, then it continues(there is no transition to another procedure based on PORV/block valve status.) Immediately after the PORV Status step in LOCA-1, SI Flow Reduction criteria are checked. All conditions should be met which are: Subcooling >0°F, AFW flow/Adequate SG NR level, RCS pressure stable or rising, PZR level >11%. A is incorrect because while a transition WILL be made to TRIP-3, it is not made in TRIP-1, it is made in LOCA-1. B is incorrect because while a transition to LOCA-1 might be made based on rising containment radiation levels, the transition must be made now. D is incorrect because the small size of the RCS leak combined with the small size of the PORV opening(as shown by normal RCS pressure), SI termination criteria can be met.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Rx Trip or Safety Injection	1-EOP-TRIP-1			27
Loss of Reactor Coolant	1-EOP-LOCA-1			25

L.O. Number

TRP001E009

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 3

Given the following conditions:

- Unit 1 was tripped from 100% power when a SBLOCA occurred.
- While performing EOP-TRIP-1, 11 SG was identified as being faulted.
- All actions have been completed to isolate 11 SG.
- After transitioning to EOP-LOCA-1, the crew is performing the Faulted SG Evaluation steps.
- 11 SG pressure is 740 psig and lowering.
- 12-14 SG pressures are all 960 psig and lowering very slowly.

Which of the following identifies how the CRS should respond, and why?

a. Transition first to EOP-LOSC-1, then LOSC-2 because all SGs are now faulted. Faulted SGs require isolation because they may be masking other accidents (or their severity) in progress.

b. Continue in LOCA-1 since the ECCS injection is cooling the RCS and causing the unisolated SG pressures to lower. Going to LOSC-1 would only perform steps which have already been performed.

c. Continue in LOCA-1 since the ECCS injection is cooling the RCS and causing the unisolated SG pressures to lower. The additional subcooling provided will allow an earlier transition to TRIP-3 during SI Flow Reduction steps.

d. Transition directly to EOP-LOSC-2 because all SGs are now faulted. Steps to determine if SI termination can be performed will be adversely affected due to the lowering RCS pressure from the SG fault(s), and cause unnecessary procedure performance.

Answer b **Exam Level** S **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 000009G244 2.2.44 **RO Value:** 4.2 **SRO Value:** 4.4 **Section:** EPE **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Small Break LOCA 009

KA Statement:

Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.

Explanation of Answers:

55.43(5) The procedure transition to LOSC-1 is made before LOCA-1 when in TRIP-1. The stem says all actions have been completed to isolated the faulted SG. These actions would have to be performed in LOSC-1. The transition out of LOSC-1 is SGTR-1 if there is a rupture or to LOCA-1. The first step in LOCA-1 is to check for faulted SG's that have not been isolated. C is incorrect because RCS pressure will still be lowering (not stable or rising) based on the faulted SG. A is incorrect because the other SGs are not faulted, they are reacting to the cool ECCS water being pumped into the RCS, but the reason is plausible. D is incorrect because there is no direct transition to LOSC-2, you first have to enter LOSC-1.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Reactor Trip or Safety Injection	1-EOP-TRIP-1			28
Loss of Reactor Coolant	1-EOP-LOCA-1			25
Loss of Secondary Coolant	1-EOP-LOSC-1			22

L.O. Number Objectives

LOCA01E009

LOSC01E004

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 4

Given the following conditions:

- Unit 2 is in MODE 5 after refueling the Rx.
- The Rx was shutdown 20 days ago.
- 21 RHR loop is providing shutdown cooling.
- 22 RHR loop is aligned for ECCS.
- 21 RHR HX inlet temperature is 105°F and stable.
- RCS pressure is 205 psig.
- 21 RHR pump begins cavitating due to a valve being mispositioned during a tagging release.
- The CRS enters S2.OP-AB.RHR-0001, Loss of RHR, and stops 21 RHR pump.
- During performance of S2.OP-AB.RHR-0001, the crew has time for normal restoration and local venting of the RHR system.
- 1 hour after the initial loss of RHR, 22 RHR pump is started.
- The RO reports RHR flow is oscillating between 1,500-3,000 gpm.
- The highest CET temperature is 184°F.

Which of the following describes how the CRS should proceed?

a. Start 21 RHR pump and initiate Attachment 7, Hot Leg Injection.

b. Start 21 RHR pump and initiate Attachment 8, Cold Leg Injection.

c. Stop 22 RHR pump and initiate Attachment 7, Hot Leg Injection.

d. Stop 22 RHR pump and initiate Attachment 8, Cold Leg Injection.

Answer	d	**Exam Level**	S	**Cognitive Level**	Application	**Facility:**	Salem 1 & 2
ExamDate:	12/3/2012						

KA:	000025A205	AA2.05	**RO Value:**	3.1*	**SRO Value:**	3.5*	**Section:**	EPE	**RO Group:**	1	**SRO Group:**	1	55.43 ✔

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

KA Statement: Ability to determine and interpret the following as they apply to Loss of Residual Heat Removal System:
Limitations on LPI flow and temperature rates of change

Explanation of Answers: 55.43(5) The conditions given in the stem indicate a RCS heatup rate of ~1.3 deg per minute. With the initial temp of 105, this will add 78 degrees and when the RHR pump is started RCS temp will be 183°. RHR flow is required to be stable between 1800-3000 after the venting and starting of the RHR pump to allow exiting the procedure with all other RHR system parameters normal.(page 12) With 1,500 gpm flow swings, this will be answered NO. Step 3.30 states to stop any running RHR pump. Step 3.32 (page 18)states to initiate an alternate method of Decay Heat Removal. With CET temps <200°F, the preferred method is Attachment 8 Cold Leg injection. Attachment 7 Hot leg injection is not preferred due to RCS being intact and <200°F. With the procedure stating to stop all RHR pumps, starting 21 is not directed.

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

L.O. Number
ABRHR1E004

Objectives

Material Required for Examination					
Question Source:	Facility Exam Bank	**Question Modification Method:**	Concept Used	**Used During Training Program**	☐
Question Source Comments	Vision Q80328 concept used, expanded to make SRO level. Changed 2 distracters to start idle RHR pump.				

Comment

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

Question Topic: SRO 5

Given the following conditions:

- Unit 2 is operating at 100% power.
- The RO reports that the PZR Cold Cal level channel (LI-462) is indicating 0%.

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

a. Enter TSAS 3.3.1.1 Reactor Trip System Instrumentation. This Tech Spec is based on being able to provide the overall reliability, redundancy, and diversity assumed available in the facility design for the protection and mitigation of accident and transient conditions. Place a single piece of red translucent tape across LI-462.

b. Enter TSAS 3.3.3.7 Accident Monitoring Instrumentation. This Tech Spec is based on ensuring sufficient information is available on selected plant parameters to monitor and assess these variables following an accident. Place an INFO sticker on LI-462.

c. No Tech Spec entry will be made since TSAS 3.3.1.1 and TSAS 3.3.3.7 are applicable to this instrument ONLY in MODES 4-6 and during movement of irradiated fuel. Place a single piece of red translucent tape across LI-462.

d. No Tech Spec entry will be made since TSAS 3.3.1.1 and TSAS 3.3.3.7 are not applicable to this instrument. Place an INFO sticker on LI-462.

~~Answer: d~~ ~~Exam Level: S~~ ~~Cognitive Level: Memory~~ **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 000028G243 | 2.2.43 | **RO Value:** 3.0 | **SRO Value:** 3.3 | **Section:** EPE | **RO Group:** 2 | **SRO Group:** 2 | 55.43 ☑

System/Evolution Title: Pressurizer Level Control Malfunction | 028

KA Statement:

Knowledge of the process used track inoperable alarms.

Explanation of Answers:

55.43(2)(5) The PZR cold cal channel is not included in the Rx Trip Instrumentation or the Accident Monitoring Tech Specs. It is used when RCS temperature is <200°F as directed in S2.OP-IO.ZZ-0006, Hot Standby to Cold Shutdown. A is incorrect because TS 3.3.1.1 is not entered, although the Bases is correct. Also, the red translucent tape is used to identify an inoperable alarm.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem Tech Specs		3.3.1.1, 3.3.3.7		
Control Room Instrumentation and Alarms	SC.OP-DL.ZZ-0010			10
Hot Standby to Cold Shutdown	S2.OP-IO.ZZ-0006			

L.O. Number

PZRP&LE010

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 6

Given the following conditions:

- Unit 1 is operating at 45% power.
- 12 SG NR Channel I has been removed from service while undergoing a Channel Calibration IAW S1.IC-CC.RCP-0045, 1LT-529 #12 Steam Generator Level Protection Channel I.
- 12 SG NR Channel IV fails high.

Which of the following describes how the CRS should respond?

a. Enter S2.OP-AB.TRB-0001, Turbine Trip <P-9. Place control rods in manual and insert to lower Rx power <5%.

b. Enter S2.OP-AB.LOAD-0001, Rapid Load Reduction. Initiate load reduction to less than 50 Mwe.

c. Enter S2.OP-AB.CN-0001, Main Feedwater / Condensate System Abnormality. Trip the Rx.

d. Enter 2-EOP-TRIP-1, Reactor Trip or Safety Injection. Verify the Rx has tripped.

Answer	c	Exam Level	S	Cognitive Level	Application	Facility:	Salem 1 & 2	ExamDate:	12/3/2012

KA:	000054A205	AA2.05	RO Value:	3.5	SRO Value:	3.7	Section:	EPE	RO Group:	1	SRO Group:	1	55.43	☑

System/Evolution Title Loss of Main Feedwater | 054

KA Statement: Ability to determine and interpret the following as they apply to Loss of Main Feedwater:
Status of MFW pumps, regulating and stop valves

Explanation of Answers: A P-14 signal is generated by 2/3 NR level channels on 12 SG being >67%, The P-14 signal trips the Main Turbine, trips the Main Feed pumps, and shuts the BF19s and 40s and 13s. (FW Isolation signal) The reactor does NOT trip on the Main Turbine trip <P-9 (49% power) A is incorrect because AB.TRB does not direct a Rx trip is both SGFPs are tripped, only states to lower power <5%. This is an incorrect action because it would force an automatic Rx on lo lo SG NR level. B is incorrect because the turbine is already tripped. C is correct because AB.CN directs a Rx trip if power is >P-10 (10%) and a loss of both SGFPs has occurred which it has from the P-14 (2/3 SG NR level channels on 1 SG > 67%). D is incorrect because below P-9 the Rx has not tripped.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Main Feedwater / Condensate System Abnorma	S2.OP-AB.CN-0001			26

L.O. Number
ABCN01E004

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 7

Given the following conditions:

- Unit 2 is at 40% power performing a shutdown.
- 4 SW Bay is isolated due to a leak on the 25SW3, 25 SW Pump Discharge Isolation Valve.
- Operators are performing the shutdown to comply with TSAS 3.7.4 because difficulties arose during the leak repair of the 25SW3.
- 2A EDG is supplying 2A 4KV vital bus for a scheduled surveillance.
- 21 and 23 SW pumps are in service.

Which of the following describes how the control room crew will respond if 2A EDG output breaker trips on Bus Differential, and 23 SW pump trips 1 minute later on over current when supplying SW flow at runout conditions?

a. Trip the Main Turbine to reduce Rx power and heat input to the RCS, and enter S2.OP-AB.TRB-0001, Turbine Trip <P-9.

b. Enter S2.OP-AB.SW-0001, Loss of Service Water Header Pressure. Trip the Main Turbine, and reduce Rx power <5% in order to place AFW in service.

c. Enter S2.OP-AB.SW-0005, Loss of All Service Water. Trip the Rx, confirm the trip, and stop RCPs to limit the heat input to the CCW system, and preserve RCP seal packages.

d. Trip the Rx and go to TRIP-1, Reactor Trip or Safety Injection. After exiting TRIP-2, Reactor Trip Response, enter S2.OP-AB.SW-0005 to perform compensatory actions for no service water pumps operating.

Answer: c | **Exam Level:** S | **Cognitive Level:** Application | **Facility:** Salem 1 & 2 | **ExamDate:** 12/3/2012

KA: 000062G406 | 2.4.6 | **RO Value:** 3.7 | **SRO Value:** 4.7 | **Section:** EPE | **RO Group:** 1 | **SRO Group:** 1 | 55.43 ☑

System/Evolution Title: Loss of Nuclear Service Water | 062

KA Statement:
Knowledge of EOP mitigation strategies.

Explanation of Answers:
55.43(5) A is incorrect because even if the actions are (some of those) performed in AB.SW-5, the next procedure entry to AB.TRB is incorrect since the Rx is tripped in AB.SW-5. B is incorrect because AB.SW-1 doesn't perform those actions. C is correct. D is incorrect because AB.SW-5 should be entered before exiting the TRIP series.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Loss of All Service Water	S2.OP-AB.SW-0005			4
Loss of Service Water Header Pressure	S2.OP-AB.SW-0001			16

L.O. Number: ABSW04E005

Objectives

Material Required for Examination:

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

Question Source Comments: Vision 88855. Added procedure entry.

Comment

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

Question Topic SRO 8

Given the following conditions:

- Salem Unit 2 was operating at 100% power when a LOCA occurred.
- Operators are performing actions in 2-EOP-LOCA-1.
- 20 minutes after the Rx was tripped:
  - RWST level is 19 feet and lowering
  - RCS pressure is 350 psig and stable.
  - Containment pressure peaked at 16 psig, and is now 13 psig and dropping slowly.
  - Containment radiation monitors read < 1R / hr.
  - RVLIS Full Range is 100%.
- 26 minutes after the Rx was tripped, the RWST lo-lo level alarm is received.
- When checking containment sump level at the beginning of 2-EOP-LOCA-3, the RO reports that containment pressure is now reading 1.5 psig.

Which of the following identifies the HIGHEST ECG classification for these conditions?

a. 4 point Alert.

b. 5 point Alert.

c. 7 point Site Area Emergency.

d. 8 point Site Area Emergency.

Answer	d	**Exam Level**	S	**Cognitive Level**	Application	**Facility:**	Salem 1 & 2	**ExamDate:**	12/3/2012

KA:	000069A201	AA2.01	**RO Value:**	3.7	**SRO Value:**	4.3	**Section:**	EPE	**RO Group:**	2	**SRO Group:**	2	55.43 ☑

System/Evolution Title Loss of Containment Integrity | 069

KA Statement: Ability to determine and interpret the following as they apply to Loss of Containment Integrity:
Loss of containment integrity

Explanation of Answers: 55.43(1,5) A LOCA which results in RCS pressure lowering to 350 psig will result in subcooling being lost. This yields 5 points due to the loss of the reactor Coolant System Barrier. Containment pressure rise followed by rapid, unexplained pressure drop (13 psig to 1.5 psig during a LOCA over 6 minutes) is 3 points for the loss of the containment barrier. The 4 point alert is if the loss of subcooling was not recognized and the loss of containment not recognized. The 5 point alert is if only the loss of the RCS barrier is recognized. The 7 point SAE is if the rCS barrier loss is only thought to be potential and not actual

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem ECG				

L.O. Number

Objectives

Material Required for Examination	SRO 8 Salem ECG

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 9

Given the following conditions:

- Unit 2 has experienced a MSLB at the Mixing Bottle.
- All attempts at MSLI have failed, and 21-24MS167s remain open.
- Operators have just completed SI termination steps in EOP-LOSC-2, Multiple Steam Generator Depressurization, and PZR level is being maintained stable.
- AFW flow to each SG is 1.0E4 lbm/hr.
- The RO reports rising pressure in 22 SG.

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

a. Transition to EOP-LOSC-1 and stop RCPs if RCS pressure is <1350 psig, since RCPs cannot be stopped in LOSC-2.

b. Transition to EOP-LOSC-1, Loss of Secondary Coolant, since one SG is now available for subsequent recovery actions.

c. Remain in EOP-LOSC-2 since returning to EOP-LOSC-1 will require a transition to EOP-LOCA-1 upon completion.

d. Remain in EOP-LOSC-2 until positive control can be established over the cooldown after the remaining Steam Generators have fully depressurized, then transition to EOP-LOSC-1.

Answer b **Exam Level** S **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 00WE12A201 EA2.1 **RO Value:** 3.2 **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: Ability to determine and interpret the following as they apply to Uncontrolled Depressurization of all Steam Generators: Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

Explanation of Answers: 55.43(5) LOSC-2 CAS states that upon a pressure rise in any SG except when performing SI termination in Steps 8-20, GO TO EOP- LOSC-1. The stem states that it is after Step 20. LOSC-1 Basis Document, page 7, states that.."Any cooldown operations that are performed as subsequent recovery actions will require at least one nonfaulted SG."

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
LOSC02E005

Objectives

Material Required for Examination

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

Question Source Comments Vision Q57956 concept used, and added the "why" to question.

Comment

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

Question Topic SRO 10

Given the following conditions:

- Salem Unit 2 was performing a Rx shutdown due to indications of failed fuel after chemistry reported reactor coolant activity to be 500 uCi/gm dose equivalent I-131.
- During the shutdown, the RO reports lowering PZR pressure and level.
- With 21 charging pump in service, PZR level continues to rapidly lower, and the RO reports containment pressure is also rising.
- The RO trips the Rx and initiates a Safety Injection, and all equipment responds as expected for the SI.
- RCS pressure continues to lower rapidly to 35 psig.
- The SM declares a Site Area Emergency, and all notifications associated with the SAE have been made.

Which of the following identifies a condition which would require a subsequent notification of the NRC, and the correct time for that notification?

a. The wind direction shifts from 0° to 180°. 15 minutes.

b. Containment radiation level exceeds 2,000 R / hr. 60 minutes.

c. Containment sump level indicated on 2CC1 has remained stable at 46%. 15 minutes.

d. The control room must be evacuated and operators cannot access the Auxiliary Building due to high radiation. 60 minutes.

Answer b **Exam Level** S **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 00WE16G430 2.4.30 **RO Value:** 2.7 **SRO Value:** 4.1 **Section:** EPE **RO Group:** 2 **SRO Group:** 2 55.43 ✔

System/Evolution Title High Containment Radiation E16

KA Statement:

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

Explanation of Answers:

55.43(1,2) The 15 minute times in the question are from the 15 minute notifications required during emergencies to the states. The NRC is not required to be notified for 60 minutes. The second knowledge part of the question is what would cause a notification to be required, i.e. a more sever E plan classification is made. The radiation levels > 2,000 R/hr adds 2 points from the containment barrier. The stem states that the SM declared a SAE, which would have been under FB4.L and RB2.L each of which is 5 points. The 2 additional points would put the unit in a GE. The wind shift while in a SAE would not require a notification because no PAR would have been made for the SAE. The containment sump level is NOT expected, with containment pressure at 35 psig, the entire contents of the RCS are on the floor and level would have risen, as is seen for LBLOCAs. The 15 minute time for this condition is wrong, however. The CR evac and inability to establish control of the plant in 15 minutes is a SAE, and the plant is already in a SAE.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem ECG				

L.O. Number

Objectives

Material Required for Examination	SRO 10 Salem ECG				
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 condition:

- Unit 1 is in MODE 5 during a plant startup.
- 11 RHR loop is in service.
- 12 RHR loop is aligned for ECCS.
- 13 RCP is in service.
- 11 charging pump is in service.
- RCS Tavg is 175°.
- RCS pressure is 310 psig.
- PZR level is 60%.

When placing the second RCP in service, RCS pressure momentarily rises to 390 psig.

Which of the following describes the RHR system response, and how the CRS should proceed?

a. The 1RH3, RHR SAF RLF VLV TO CONTAINMENT SUMP opens. Enter S2.OP-AB.PZR-0001, PZR Pressure Malfunction, and ensure that any PZR PORV that opened in response to the RCS pressure has shut.

b. The 1RH2, RHR COMMON SUCT MOV automatically shuts. Enter S2.OP-AB.PZR-0001 and ensure that any PZR PORV that opened in response to the RCS pressure has shut.

c. The 1RH3 opens. Enter S2.OP-AB.LOCA-0001, Shutdown LOCA, and isolate letdown to minimize RCS inventory loss.

d. The 1RH2 automatically shuts. Enter S2.OP-AB.LOCA-0001 and isolate letdown to minimize RCS inventory loss.

Answer a **Exam Level** S **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 005000A202 A2.02 **RO Value:** 3.5 **SRO Value:** 3.7 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43 ☑

System/Evolution Title Residual Heat Removal System 005

KA Statement: Ability to (a) predict the impacts of the following on the Residual Heat Removal System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation:
Pressure transient protection during cold shutdown

Explanation of Answers: 55.43(5) With RHR in service both the PZR PORVs and the 1RH3 will open at their 375 psig setpoints. The RH3 opening will not be apparent to the control room, but the PORV opening will. AB.PZR, Attachment 3, will ensure the PORV has shut. The 1RH2 has an OPENING interlock that requires RCS pressure to be <375 psig, then a keyswitch opens the valve. There is no automatic closure associated with this valve on high pressure. AB.LOCA is used in MODE 3 and MODE 4 with the accumulators isolated, and with the unit in MODE 5 as described in the stem, would not be entered.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
PZR Pressure Malfunction	S1.OP-AB.PZR-0001			16
Shutdown LOCA	S1.OP-AB.LOCA-0001			6
Residual Heat Removal	205232 Sheets 1 and 2			43,40

L.O. Number
RHR000E004

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 15% power, performing a power ascension IAW S2.OP-IO.ZZ-0003, Hot Standby to Minimum Load, prior to rolling the Main Turbine.
- The RO reports the Bistable for Intermediate Range Channel I on 2RP4 has just illuminated.
- The reactor remains at power.

Which of the following describes how this bistables current condition will affect the power ascension?

a. This bistable illumination is NOT expected at this point in the power ascension. Power ascension may continue while investigating cause of faulty bistable operation.

b. An ATWT has occurred, attempt to trip the reactor manually. If the reactor does NOT trip, verify the turbine is tripped and initiate rod insertion, then go to FRSM-1.

c. This bistable illumination is expected during a power ascension. BLOCK both intermediate range channels by depressing the BLOCK INTERMEDIATE RANGE A and B PBs IAW OHA F-17 ARP. Continue the power ascension.

d. A failure of the IR high flux trip block has occurred. Lower Rx power to less than 5% and depress BLOCK INTERMEDIATE RANGE B pushbutton to block Train B IAW S2.OP-IO.ZZ-0004 POWER OPERATION.

Answer a **Exam Level** S **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 012000A201 A2.01 **RO Value:** 3.1 **SRO Value:** 3.6 **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:

Faulty bistable operation

Explanation of Answers: 55.43(5)A is correct because the alarm setpoint is 25%. The action is correct because the IR hi flux trip was blocked when Rx power was >P-10. TSAS 3.3.1.1, Functional Unit 5, Action 3.c states above 5% power power operation may continue. B is incorrect because the IR Hi Flux trip is blocked and a Rx trip is not expected. The actions are correct for an ATWT IAW EOP-TRIP-1. Distracter C is incorrect because it is not expected to occur at this power level. While the light WILL light at 25% power, its output is already blocked. Distracter D is incorrect because a failure has NOT occurred of the block, and power is not required to be lowered.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Hot Standby to Minimum Load	S2.OP-IO.ZZ-0003		37	37

L.O. Number
RXPROTE012
IOP003E004
IOP003E005

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

Given the following conditions:

- Unit 1 is performing a Reactor startup IAW S1.OP-IO.ZZ-0003 Hot Standby to Minimum Load.
- All Shutdown Bank control rods have been fully withdrawn.
- Control Bank A is fully withdrawn.
- As Control Bank B is withdrawn past 20 steps, the RO reports OHA E-48, ROD BOTTOM has just alarmed and remains locked in.
- No other alarms are received.

Which of the following describes how the system is operating, and how the CRS should proceed?

a. The Rod Bottom Bistable causes OHA E-48 to alarm as each control bank is withdrawn past 20 steps and is expected. The CRS should direct the reset of the Non-Urgent Failure to reset the alarm, then continue the startup.

b. The Rod Bottom Bistable causes OHA E-48 to alarm as each control bank is withdrawn past 20 steps and is expected. The CRS should direct the RO to depress the STARTUP pushbutton on 1CC2 to reset the alarm, and continue the startup.

c. The Rod Bottom Bistable cleared when Control Bank A was withdrawn past 20 steps and OHA E-48 is unexpected at this time. The CRS should enter S1.OP-AB.ROD-0002 Dropped Rod and direct the opening of the Reactor Trip Breakers to terminate the Rx startup.

d. The Rod Bottom Bistable cleared when Control Bank A was withdrawn past 20 steps and OHA E-48 is unexpected at this time. The CRS should place the startup on hold and initiate S1.OP-AB.ROD-0002, Dropped Rod, or S1.OP-AB.ROD-0004, Rod Position Indication Failure, to determine what malfunction has occurred.

Answer: d **Exam Level:** S **Cognitive Level:** Comprehension **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 016000G237 | 2.2.37 **RO Value:** 3.6 **SRO Value:** 4.6 **Section:** SYS **RO Group:** 2 **SRO Group:** 2 55.43 ✔

System/Evolution Title Non-Nuclear Instrumentation System 016

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

Explanation of Answers: The Rod Bottom alarm CLEARS when CB A is withdrawn past 20 steps. This is because a Rod Bottom Bistable Bypass for each of the other three control banks B,C,D bypass the alarm for their respective bank when all rods in that group are below 35 steps. This means that the alarm was CLEAR when it alarmed, it did not reflash. Since no other alarms occurred, the CRS should place the startup on hold and enter AB.ROD-2 (which will direct entry into AB.ROD-4) or enter AB.ROD-4 directly to investigate the failure. There is a 4 hour window for having to terminate the startup (IOP-3, step 5.2.19) so opening the trip breakers is not required.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Rod Control and Position Indicating Systems Le	NOS05RODS00-11			11
Dropped Rod	S1.OP-AB.ROD-0002			
Rod Position Indication Failure	S1.OP-AB.ROD-0004			

L.O. Number
RODS00E006

Objectives

Material Required for Examination

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

Question Source Comments Vision Q60249 expanded from rod bottom bistable question to whether alarm is expected and what CRS should do.

Comment

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

Question Topic SRO 14

Given the following conditions:

- Unit 2 is operating at 100% power.
- Technicians are performing a sensor calibration of Containment Pressure Channel IV IAW S2.IC-SC.RCP-0066, 2PT-948A CONTAINMENT PRESSURE PROTECTION CHANNEL IV.
- All bistables and test switches are in their proper alignment for the calibration.
- While I&C Technicians are performing the calibration, the control room receives OHA C-16, PHASE B CNTMT ISOL ACT.

Which of the following identifies what will occur, and how the CRS should respond to this alarm?

a. Phase B isolation valves will shut ONLY. The isolation will not be able to be reset until I&C returns their bistables and test switches to normal. Trip the Rx, stop all RCPs, and GO TO EOP-TRIP-1.

b. Phase B isolation valves will shut and Containment Spray valves will open. Attempt to reset and open the Phase B isolation valves IAW OHA C-16 ARP. If unable to reset Phase B, GO TO S2.OP-AB.RCP-0001, RCP Abnormality.

c. Phase B isolation valves will shut and Containment Spray valves will open. The isolation will not be able to be reset until I&C returns their bistables and test switches to normal. Trip the Rx, stop all RCPs, and GO TO EOP-TRIP-1.

d. Phase B isolation valves will shut ONLY. Attempt to reset and open the Phase B isolation valves IAW OHA C-16 ARP. If unable to reset Phase B, GO TO S2.OP-AB.RCP-0001, RCP Abnormality.

Answer b **Exam Level** S **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 026000G450 2.4.50 **RO Value:** 4.2 **SRO Value:** 4.0 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43

System/Evolution Title Containment Spray System 026

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

Explanation of Answers:
55.43(5) This alarm is not expected to occur during the sensor cal, as it requires 2/4 containment pressure channels to see 15 psig. The ARP says if cont pressure is <15 psig, attempt to reset and open Phase B isolation valves, and if unsuccessful go to AB.RCP based on the loss of CCW to the RCPs. The CS valves will reposition.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Overhead Annunciators Window C	S2.OP-AR.ZZ-0003		19	17

L.O. Number Objectives
CSPRAYE008

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:

- Fuel handling is in progress in the Unit 2 Spent Fuel Pool when a fuel assembly in the Spent Fuel Handling Tool is dropped.
- Gas bubbles are observed in the vicinity of the dropped fuel assembly.
- 2R5, Fuel Handling Building (FHB) radiation monitor goes into alarm and stabilizes at 25 mR/hr.

Which of the following describes the effect of this event, and contains actions that will be performed IAW S2.OP-AB.FUEL-0001, Fuel Handling Incident?

a. ALL Fuel Handling Crane motion is locked out to prevent further damage to an affected fuel assembly. Ensure all available FHB Exhaust fans are in service.

b. ALL Fuel Handling Crane motion EXCEPT downward movement is locked out to prevent raising a damaged fuel assembly. Ensure the FHB Truck Bay Roll Up Door is closed.

c. The FHB Evacuation alarm actuates to alert all personnel of the FHB high radiation condition. Evacuate ALL personnel from the FHB until Radiation Protection has performed area surveys.

d. FHB ventilation automatically swaps to place the Charcoal Filter in service to prevent a release to the environment. Ensure the FHB Watertight Door remains closed except for normal personnel passage.

Answer d **Exam Level** S **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 034000A201 A2.01 **RO Value:** 3.6 **SRO Value:** 4.4 **Section:** SYS **RO Group:** 2 **SRO Group:** 2 55.43 ☑

System/Evolution Title Fuel Handling Equipment System 034

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

Dropped fuel element

Explanation of Answers: 55.43(7) The 2R5 in alarm (11 mR/hr alarm, 7mR/hr warning) swaps the FHB exhaust ventilation to the Charcoal Filter and starts both FHB Exhaust Fans. The normal configuration for FHB ventilation is the single Supply Fan running, and BOTH Exhaust Fans running. C is incorrect because non-essential personnel are evacuated, as actions are required to be performed prior to evacuating ALL personnel. The alarm will actuate. A and B are incorrect because the FH crane only locks out as described in B with the 2R32A rad monitor on the crane itself in alarm, not the 2R5 area monitor, and the action is correct. D contains a correct auto actuation and a correct action.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Fuel Handling Incident	S2.OP-AB.FUEL-0001			5
Radiation Monitoring System Lesson Plan	NOS05RMAS000-14			14

L.O. Number

ABFUEL01E002

Objectives

Material Required for Examination

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

Question Source Comments Vision Q109317. Added why and action to be performed in AB.Fuel-2.

Comment

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

Question Topic SRO 16

Given the following conditions:

- Unit 2 is stable in MODE 3 at NOT, NOP, IAW S2.OP-IO.ZZ-0003, Hot Standby to Minimum Load.
- Rod Control is energized.
- 23 charging pump is in service.
- 21-24MS10 Atmospheric Relief Valves are in Auto controlling SG pressures at 990 psig.
- Main Steam Dumps are in MS Pressure Control - Manual with 0% demand.
- 23TB40 fails full open.

Which of the following describes the initial plant response to this failure, and how should the CRS proceed?

a. 23 Main Steamline flow will rise. Direct the PO raise the setpoints of 21-24MS10s IAW S2.OP-IO.ZZ-0003 to restore Tavg to 547°F.

b. ALL Main Steamline flows will rise. Enter S2.OP-AB.STM-0001, Excessive Steam Flow, and direct the PO to initiate a Main Steamline Isolation.

c. ALL Main Steamline pressures will lower. Enter S2.OP-AB.STM-0001, Excessive Steam Flow, and direct the PO to depress the Train A and Train B Off & Reset Bypass Tavg pushbuttons on 2CC3.

d. 23 Main Steamline pressure will lower until 23MS10 is fully shut, then stabilize. Initiate S2.OP-IO.ZZ-0006, Hot Standby to Cold Shutdown and direct the PO commence a cooldown at <100°F / hr using the 21-24MS10s.

Answer c **Exam Level** S **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 039000A204 A2.04 **RO Value:** 3.4 **SRO Value:** 3.7 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43 ☑

System/Evolution Title Main and Reheat Steam System 039

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

Malfunctioning steam dump

Explanation of Answers: 55.43(5) The steam dump valve are arranged by condenser, not steamlines. 23TB40 goes into 23 condenser. The distracters with 23 Main steamline flow and pressure will occur, but the actions would not be performed per the IOP in effect. With the Rx trip breakers shut, entry into the Excessive Steam flow AB is correct, and the action in AB.STM with a malfunctioning Steam Dump Valve is to turn off both Trains of Steam Dumps. The action to initiate a MSLI would occur if a Rx trip were required based on power rising uncontrollably

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Excessive Steam Flow	S2.OP-AB.STM-0001			9

L.O. Number

MSTEAME015

Objectives

Material Required for Examination

Question Source: Facility Exam Bank **Question Modification Method:** Significantly Modified **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:

- Unit 2 is in MODE 2 with a startup in progress.
- Welding in the Unit 2 Turbine Building has caused an actual deluge actuation to occur in the Unit 2 Turbine Building.
- The control room receives the following alarms:
  - OHA A-7 FIRE PROT FIRE
  - OHA A-15 FIRE PUMP 1/2 RUN
  - Coded Fire alarm 2-2-1 TURBINE GEN AREA -88' ELEV

Which of the following identifies how the Fire Protection system has responded, and how should the CRS proceed?

a. ONLY one diesel fire pump has started. Enter S2.OP-AB.FIRE-0001, Control Room Fire Response. Place BOTH Unit 1 and Unit 2 CAV in Fire Outside Control Area.

b. ONLY one diesel fire pump has started. Enter S2.OP-AB.FP-0001, Fire Protection System Malfunction. The Unit startup will be have to be stopped due to the current capability of the Fire Protection system being degraded.

c. BOTH diesel fire pumps have started. Enter S2.OP-AB.FIRE-0001, Control Room Fire Response. Place BOTH Unit 1 and Unit 2 CAV in Fire Outside Control Area.

d. BOTH diesel fire pumps have started. Enter S2.OP-AB.FP-0001, Fire Protection System Malfunction. The Unit startup will be have to be stopped due to the current capability of the Fire Protection system being degraded.

Answer a **Exam Level** S **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 086000A203 A2.03 **RO Value:** 2.7 **SRO Value:** 2.9 **Section:** SYS **RO Group:** 2 **SRO Group:** 2 55.43 ☑

System/Evolution Title Fire Protection System 086

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

Inadvertent actuation of the FPS due to circuit failure or welding

Explanation of Answers: 55.43(5) A deluge valve opening as stated in stem will cause FP system header pressure to lower to the point that #1 Fire pump will start at 85 psig, and will restore header pressure. Each Fire Pump is rated to supply all fire protection needs. The second Fire Pump will NOT start, as its auto start pressure is set at 75 psig. When the deluge occurs, the CRS will not know it is inadvertent. The CRS will respond to the auto start of the pump IAW ARP for A-7 FIRE PROT FIRE and A-15 based on the deluge valve opening. This directs implementation of AB.FIRE, which checks if the CR is affected, then directs placing CR ventilation in fire

outside the CR. AB.FP is NOT entered, because there is no indication of a malfunction, but indication of a valid deluge valve actuation. The shutdown distracter is plausible because it is the action required in AB.FP if both normal and backup fire protection systems are unavailable. OHA A-15 annunciates when EITHER (or both)Fire Pumps start.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Control Room Fire Response	S2.OP-AB.FIRE-0001			7
Fire Protection System Lesson Plan	NOS05FIRPRO-07			7
Fire Protection System Malfunction	S2.OP-AB.FP-0001			2

L.O. Number

FIRPROE004

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 2 has experienced a LOCA.
- 21 RHR pump has been C/T for the last 2 days.
- Containment pressure is 14 psig and rising slowly.
- 22 RHR pump trips after performing Safeguards Reset actions in EOP-LOCA-1, Loss of Reactor Coolant.
- The CRS transitions to LOCA-5, Loss of Emergency Recirculation.
- The STA reports a valid PURPLE path on Containment Environment with containment pressure at 15 psig and rising slowly, and no higher PURPLE or any RED paths present.

Which of the following describes how the CRS should use Containment Spray pumps?

The CRS should start/stop Containment Spray pumps in.....

a. EOP-FRCE-1, Response to Excessive Containment Pressure, because Containment Spray pumps will not auto start with the SECs reset.

b. EOP-FRCE-1 because at least one Containment Spray pump is required to be running whenever containment pressure is >15 psig.

c. EOP-LOCA-5 to establish minimum required CS flow in order to conserve RWST inventory.

d. EOP-LOCA-5 since FRPs are not in effect when LOCA-5 is in effect.

Answer c **Exam Level** S **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 103000G422 2.4.22 **RO Value:** 3.6 **SRO Value:** 4.4 **Section:** SYS **RO Group:** 1 **SRO Group:** 1 55.43 ✓

System/Evolution Title Containment System 103

KA Statement: Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.

Explanation of Answers: 55.43(5) The transition to FRCE-1 is required upon a valid PURPLE path (15 psig containment). A is incorrect because FRCE-1 specifically asks if LOCA-5 is in effect, and if so, direct CS pumps to be operated IAW LOCA-5. B is incorrect because of the above reason, and additionally, using the table found in LOCA-5 as the bases, there are conditions with cont press>15 psig that NO CS pumps will be directed to be started. C is correct. D is incorrect because FRPs are in effect after the transition out of TRIP-1, and there is no direction to suspend FRPs either in LOCA-1 or LOCA-5

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

- CONTMTE012
- LOCA05E006
- FRCE00E006

Objectives

Material Required for Examination

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

Question Source Comments Vision Q77740 modified to ask what procedure 08-01 NRC Exam

Comment

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

Question Topic: SRO 19

Given the following conditions:

- Unit 2 is in MODE 3 preparing for a startup.
- 21 RDMG set motor AND generator breakers are closed, and BOTH Reactor Trip Breakers A and B are shut for rod control testing.

Which of the following identifies how many Reactor Coolant loops are REQUIRED to be in operation IAW Salem Tech Spec 3.4.1.2.c, Reactor Coolant System, Hot Standby, and correctly reflects its Bases?

a. Four, because single failure considerations require all loops in operation when rod control is energized.

b. One, because it is sufficient to provide positive pressure control of the RCS with a bubble established in the PZR.

c. Four, because it ensures DNB criteria are satisfied for any conditions under which control rods are not fully inserted.

d. One, because it provides adequate flow to ensure mixing, prevent stratification, and produce gradual reactivity changes during boron concentration reductions in the Reactor Coolant System.

Answer: a **Exam Level**: S **Cognitive Level**: Memory **Facility**: Salem 1 & 2 **ExamDate**: 12/3/2012

KA: 194001G132 2.1.32 **RO Value**: 3.8 **SRO Value**: 4.0 **Section**: PWG **RO Group**: 1 **SRO Group**: 1 55.43 ☑

System/Evolution Title: GENERI

KA Statement: Ability to explain and apply all system limits and precautions.

Explanation of Answers: 55.43(2) All of the choices have their reasons pulled from the Bases section of Tech Spec for RCP operation. The conditions in the stem indicate that Rod Control is energized. With rod control energized, 4 RCPs must be in operation. As per the Bases on page B3/4 4-1, it is for single failure criteria. B is incorrect because 4 loops are required. C is incorrect because DNB is not a bases for Mode 3 RCP operation, it is a Mode 1 and 2 bases.. D is incorrect because it is one RCP, but has the correct bases for when only one RCP is required

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem Tech Specs		3.4.1.2	3/4 4-2	44
Salem Tech Specs Bases		3/4.4.1	B3/4 4-1	197

L.O. Number: RCPUMPE010 — Objectives

Material Required for Examination:

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

Question Source Comments: Q27905 Question originally asked why all RCPs had to be running with energized rod control. Modified so that candidate had to determine rod control is energized, then decide how many RCPs had to be running, in addition to

Comment:

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

Question Topic SRO 20

Given the following conditions:

- Both units are operating at 100% power.
- Reactor Engineering has determined that a single fuel assembly in the Spent Fuel Pool must be moved to a new storage location.
- A Notification has been submitted.
- The assembly has been in the SFP for 100 months.
- The SM has given permission, and Radiation Protection has been notified of the movement.

Which of the following describes the Operations Department requirements for this evolution IAW S2.OP-IO.ZZ-0010, SPENT FUEL POOL MANIPULATIONS?

A qualified Senior Reactor Operator...

a. must directly monitor the fuel movement from the crane trolley.

b. is NOT required if SFP boron concentration is verified >2000 ppm.

c. must be present in the Fuel Handling Building during the fuel movement.

d. is NOT required to observe the fuel movement if a Qualified Reactor Engineer is present.

Answer d **Exam Level** S **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 194001G135 2.1.35 **RO Value:** 2.2 **SRO Value:** 3.9 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43 ☑

System/Evolution Title GENERI

KA Statement: Knowledge of the fuel-handling responsibilities of SROs.

Explanation of Answers: 55.43(7) S2.OP-IO.ZZ-0010, Precautions and Limitiations, 2.2 states a Reactor Engineer OR SRO must be assigned for Spent Fuel Pool manipulations. A is incorrect because even if a SRO was assigned, they are only required to supervise from the area, not specifically on the trolley. B is incorrect because SFP boron concentration is not a pre-requisite to who is required to supervise fuel movment. C is incorrect and D is correct because a RE OR SRO is required.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Spent fuel Pool Manipulations	S2.OP-IO.ZZ-0010			31

L.O. Number

REFUELE012

Objectives

Material Required for Examination

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

Question Source Comments Vision Q80747 editorially modified choices

Comment

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

Question Topic SRO 21

Of the following, which identifies who will APPROVE the installation of a Temporary Configuration Change IAW CC-AA-112-1001, Attachment 5, Temporary Configuration Change Package Installation?

a. Plant Operations Review Committee (PORC) Chairman.

b. System Manager(s) for affected system(s).

c. Operations Manager.

d. Shift Manager / CRS.

Answer d **Exam Level** S **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 194001G211 2.2.11 **RO Value:** 2.3 **SRO Value:** 3.3 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43 ☑

System/Evolution Title GENERI

KA Statement:

Knowledge of the process for controlling temporary design changes.

Explanation of Answers:

55.43(3) CC-AA-112 and associated T&RM delineate who approves Temporary Configuration changes. A is incorrect because the System Manager (SM) performs a review of the TCCP. The SM is also responsible for reviewing the limited duration requirements for temporary changes installed per Maintenance Rule (a)(4). SM is responsible for assisting the RE with post installation testing. SM is also responsible for ensuring that TCCP Extended Installation Justification is approved. A is incorrect because the PORC is a multi-disciplined committee responsible for review of activities that have

the potential to affect nuclear safety. C is incorrect because the Ops Manager is not required to approve TCCs.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
TEMPORARY CONFIGURATION CHANGES	CC-AA-112	Section 3		12
Temporary Configuration Change Implementatio	CC-AA-112-1001	Attachment 5		1

L.O. Number

MISCAPE001

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 22

Given the following conditions:

- Unit 2 is operating at 100% power.
- 2B EDG is C/T for scheduled maintenance, with a scheduled return to service in 24 hours.
- It is discovered that 2A EDG monthly surveillance was not performed within its 31 day required periodicity.
- The required 2A EDG surveillance was last performed 33 days ago.

Which of the following identifies the status of 2A EDG IAW Tech Specs, and why?

2A EDG is ...

a. INOPERABLE because it has exceeded its 31 day surveillance requirement.

b. INOPERABLE since the 24 hour delay time past the 31 day requirement has been exceeded.

c. OPERABLE because the normal surveillance interval plus 25% extension has not been exceeded.

d. OPERABLE because the surveillance can be performed within the 24 hour delay time which starts upon discovery of the missed surveillance.

Answer c **Exam Level** S **Cognitive Level** Application **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 194001G237 2.2.37 **RO Value:** 3.6 **SRO Value:** 4.6 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43 ☑

System/Evolution Title GENERI

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

Explanation of Answers:
55.43(2) Tech Spec 4.0.2 states..."Each Surveillance Requirement shall be performed within the specified surveillance interval with a maximum allowable extension not to exceed 25 percent of the specified surveillance interval." Since the 25% of 31 days has not been exceeded, the EDG remains OPERABLE, since its surveillance is not required to be performed until 31+7.75 days. A is incorrect because of the 25% time. B is incorrect because the 24 hour delay time is not applicable until after the 25% extension expires, and since it is a 31 day frequency could be allowed to go to 31 days (per Tech Spec 4.0.3). D is incorrect because the 24 hour delay time is N/A first because the allowable time would be longer, and second because it is not applicable yet. 2B EDG being inoperable does not affect the question since 2A is not out of periodicity yet, and is still considered operable.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem Tech Specs		Surveillance Requirem	3/4 0-3	

L.O. Number
TECHSPE011
TECHSPE014

Objectives

Material Required for Examination

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

Question Source Comments Vision 60376 made into a specific operability question.

Comment

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

Question Topic SRO 23

Given the following condition:

- Unit 2 was manually tripped at 20:00:00 on January 21st to enter a refueling outage

If all other requirements are met, which of the following is the EARLIEST time that movement of fuel in the Rx vessel could occur IAW Tech Specs?

a. 2000 on January 24th.

b. 0400 on January 25th.

c. 0400 on January 26th.

d. 2000 on January 28th.

Answer	b	**Exam Level**	S	**Cognitive Level**	Application	**Facility:**	Salem 1 & 2	**ExamDate:**	12/3/2012

KA:	194001G313	2.3.13	**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 radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.

Explanation of Answers:

55.43(7,2) TSAS 3.9.3.a states that for refueling outages between Oct. 15- May 15th, the reactor shall be subcritical for 80 hours. 80 hours from 2000 on January 21 is 0400 on January 25th. Per Tech Specs Bases, the minimum requirement for Rx subcriticality prior to movement of irradiated fuel assemblies in the Reactor Pressure Vessel ensures sufficient decay time has elapsed to allow the radioactive decay of the short lived fission products. The 80 hour decay time (LAR S08-01) is consistent with the assumptions used in the fuel handling accident analysis. When outside these months, 168 hour decay is required, which is Jan 28th 2000 distracter. The 0400 on Jan 26th is correct time of day but one day late.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem Tech Specs		Decay Time 3.9.3	3/4 9-3	273

L.O. Number
REFUELE012

Objectives

Material Required for Examination

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

Question Source Comments Vision Q84937

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. SM / Emergency Duty Officer (EDO).

d. Radiological Assessment Coordinator (RAC).

Answer c **Exam Level** S **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 194001G426 2.4.26 **RO Value:** 3.1 **SRO Value:** 3.6 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43 ☑

System/Evolution Title GENERI

KA Statement: Knowledge of facility protection requirements, including fire brigade and portable fire fighting equipment usage.

Explanation of Answers: 55.43(7)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) B 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

FIRPROE007

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 08-01 SRO NRC exam (5/17/2010)

Comment

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

Question Topic SRO 25

Given the following conditions:

- 22 CVCS Monitor Tank was released to the Delaware River earlier this shift.
- The release was secured 2 hours ago during the performance of S2.OP-SO.WL-0002, Radioactive Release from 22 CVCS Monitor Tank.
- During a sample review after the release was secured, the Chemistry Department recognized that a Radioactive Liquid Release to the Delaware River was performed with an isotopic concentration which exceeded the ECG EAL RU1.3 Unusual Event threshold of 2X the ODCM for >60 minutes.

Which of the following describes how this should be addressed?

a. Initiate a non-emergency one hour report for this After-the-Fact event.

b. Notify the NJ DEP within one hour of the report by Chemistry Department that the release rate exceeded the ODCM.

c. Declare an Unusual Event based on exceeding the EAL at the time of the event, then terminate the UE because the EAL threshold is no longer being exceeded.

d. Declare an Unusual Event based on exceeding the EAL at the time of the event, then retract the UE because the EAL threshold was NOT exceeded when the declaration was made.

Answer a **Exam Level** S **Cognitive Level** Memory **Facility:** Salem 1 & 2 **ExamDate:** 12/3/2012

KA: 194001G429 2.4.29 **RO Value:** 3.1 **SRO Value:** 4.4 **Section:** PWG **RO Group:** 1 **SRO Group:** 1 55.43 ☑

System/Evolution Title GENERI

KA Statement:

Knowledge of the emergency plan.

Explanation of Answers:

55.43.(5) Salem ECG, Introduction and Usage, Section 8.6, Conditions Discovered After-the-Fact, describes an after-the-fact event as an event that exceeded an EAL threshold and was not recognized at the time of occurrence but is identified greater than one hour after the conditions has occurred and the condition no longer exists. The stem identifies that the liquid release was terminated 2 hours ago, which terminates the release exceeding the ODCM. After the Fact events that occur will be assessed and evaluated to ensure that no EAL currently applies. An emergency declaration is NOT required and a non-emergency One-Hour Report should be initiated. The NJ DEP notification is required for spills, not discharges normally performed.

Reference Title	Facility Reference Number	Reference Section	Page No.	Revision
Salem ECG	EP-SA-111-101	Intro and Usage	13	00

L.O. Number

Objectives

Material Required for Examination

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

Question Source Comments Objective from VISION is EPTRAININGE1, Given EP related issues and topics, analyze the issue, classify events and communicate to the States, IAW approved station procedures. Not listed in drop down menu.

Comment