Facility: Salem Printed: 09/07/2015

Date Of Exam: 12/21/2015

Tier	Group	RO K/A Category Points												SRO-Only Points				
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	A2			G*	Total
1. Emergency & Abnormal Plant Evolutions	1	3	3	3	N/A			3	3	N/A		3	18	0			0	0
	2	2	2	1				2	2			0	9	0			0	0
	Tier Totals	5	5	4				5	5			3	27	0			0	0
2. Plant Systems	1	3	2	3	3	2	2	3	3	2	3	2	28	0			0	0
	2	1	1	1	1	1	1	1	1	1	1	0	10	0		0	0	0
	Tier Totals	4	3	4	4	3	3	4	4	3	4	2	38	0			0	0
3. Generic Knowledge And Abilities Categories		1			2			3			4		10	1	2	3	4	0
		3			3			2			2			0	0	0	0	

Note:

1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).

2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.

3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.

4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.

5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.

6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.

7.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.

8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.

9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

PWR RO Examination Outline

Printed: 09/07/2015

Facility: Salem

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1** **Form ES-401-2**

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
000007 Reactor Trip - Stabilization - Recovery / 1			X				EK3.01 - Actions contained in EOP for reactor trip	4.0	1
000008 Pressurizer Vapor Space Accident / 3	X						AK1.02 - Change in leak rate with change in pressure	3.1	1
000009 Small Break LOCA / 3		X					EK2.03 - S/Gs	3.0	1
000022 Loss of Rx Coolant Makeup / 2			X				AK3.02 - Actions contained in SOPs and EOPs for RCPs, loss of makeup, loss of charging, and abnormal charging	3.5	1
000025 Loss of RHR System / 4		X					AK2.01 - RHR heat exchangers	2.9	1
000027 Pressurizer Pressure Control System Malfunction / 3						X	2.1.7 - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.4	1
000029 ATWS / 1	X						EK1.03 - Effects of boron on reactivity	3.6	1
000038 Steam Gen. Tube Rupture / 3						X	2.4.16 - Knowledge of EOP implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, and severe accident management guidelines.	3.5	1
000054 Loss of Main Feedwater / 4	X						AK1.01 - MFW line break depressurizes the S/G (similar to a steam line break)	4.1	1
000055 Station Blackout / 6					X		EA2.01 - Existing valve positioning on a loss of instrument air system	3.4	1
000057 Loss of Vital AC Inst. Bus / 6				X			AA1.01 - Manual inverter swapping	3.7*	1
000058 Loss of DC Power / 6				X			AA1.01 - Cross-tie of the affected dc bus with the alternate supply	3.4*	1
000062 Loss of Nuclear Svc Water / 4			X				AK3.02 - The automatic actions (alignments) within the nuclear service water resulting from the actuation of the ESFAS	3.6	1
000077 Generator Voltage and Electric Grid Disturbances / 6					X		AA2.01 - Operating point on the generator capability curve	3.5	1
W/E04 LOCA Outside Containment / 3		X					EK2.2 - Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility	3.8	1

PWR RO Examination Outline

Printed: 09/07/2015

Facility: Salem

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1** **Form ES-401-2**

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4						X	2.4.20 - Knowledge of operational implications of EOP warnings, cautions, and notes.	3.8	1
W/E11 Loss of Emergency Coolant Recirc. / 4				X			EA1.3 - Desired operating results during abnormal and emergency situations	3.7	1
W/E12 - Steam Line Rupture - Excessive Heat Transfer / 4					X		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.4	1
K/A Category Totals:	**3**	**3**	**3**	**3**	**3**	**3**	**Group Point Total:**		**18**

PWR RO Examination Outline

Printed: 09/07/2015

Facility: Salem

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2** **Form ES-401-2**

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
000001 Continuous Rod Withdrawal / 1	X						AK1.05 - Effects of turbine-reactor power mismatch on rod control	3.5	1
000028 Pressurizer Level Malfunction / 2	X						AK1.01 - PZR reference leak abnormalities	2.8*	1
000037 Steam Generator Tube Leak / 3					X		AA2.01 - Unusual readings of the monitors; steps needed to verify readings	3.0	1
000067 Plant Fire On-site / 9			X				AK3.02 - Steps called out in the site fire protection plan, FPS manual, and fire zone manual	2.5	1
000074 Inad. Core Cooling / 4		X					EK2.03 - AFW pump	4.0	1
000076 High Reactor Coolant Activity / 9					X		AA2.03 - RCS radioactivity level meter	2.5	1
W/E03 LOCA Cooldown - Depress. / 4				X			EA1.3 - Desired operating results during abnormal and emergency situations	3.7	1
W/E13 Steam Generator Over-pressure / 4		X					EK2.2 - Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility	3.0	1
W/E14 Loss of CTMT Integrity / 5				X			EA1.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.7	1
K/A Category Totals:	**2**	**2**	**1**	**2**	**2**	**0**	**Group Point Total:**		**9**

PWR RO Examination Outline

Printed: 09/07/2015

Facility: Salem

ES - 401 **Plant Systems - Tier 2 / Group 1** **Form ES-401-2**

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
003 Reactor Coolant Pump										X		A4.07 - RCP seal bypass	2.6*	1
003 Reactor Coolant Pump	X											K1.01 - RCP lube oil	2.6	1
004 Chemical and Volume Control				X								K4.13 - Interlock between letdown isolation valve and flow control valve	3.2*	1
004 Chemical and Volume Control					X							K5.49 - Purpose and method of hydrogen removal from RCS before opening system: explosion hazard, nitrogen purge	2.7	1
005 Residual Heat Removal			X									K3.05 - ECCS	3.7*	1
006 Emergency Core Cooling											X	2.2.42 - Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	3.9	1
007 Pressurizer Relief/Quench Tank	X											K1.01 - Containment system	2.9	1
008 Component Cooling Water								X				A2.05 - Effect of loss of instrument and control air on the position of the CCW valves that are air operated	3.3*	1
010 Pressurizer Pressure Control										X		A4.02 - PZR heaters	3.6	1
010 Pressurizer Pressure Control				X								K4.01 - Spray valve warm-up	2.7	1
012 Reactor Protection										X		A4.01 - Manual trip button	4.5	1
012 Reactor Protection		X										K2.01 - RPS channels, components, and interconnections	3.3	1
013 Engineered Safety Features Actuation	X											K1.12 - ED/G	4.1	1
022 Containment Cooling									X			A3.01 - Initiation of safeguards mode of operation	4.1	1
026 Containment Spray			X									K3.02 - Recirculation spray system	4.2*	1
039 Main and Reheat Steam								X				A2.05 - Increasing steam demand, its relationship to increases in reactor power	3.3	1
059 Main Feedwater							X					A1.07 - Feed Pump speed, including normal control speed for ICS	2.5*	1
061 Auxiliary/Emergency Feedwater					X							K5.03 - Pump head effects when control valve is shut	2.6	1
061 Auxiliary/Emergency Feedwater						X						K6.02 - Pumps	2.6	1
062 AC Electrical Distribution			X									K3.03 - DC system	3.7	1
062 AC Electrical Distribution							X					A1.01 - Significance of D/G	3.4	1

PWR RO Examination Outline

Printed: 09/07/2015

Facility: Salem

ES - 401 **Plant Systems - Tier 2 / Group 1** **Form ES-401-2**

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic load limits	Imp.	Points
063 DC Electrical Distribution				X								K4.01 - Manual/automatic transfers of control	2.7	1
064 Emergency Diesel Generator						X						K6.08 - Fuel oil storage tanks	3.2	1
073 Process Radiation Monitoring							X					A1.01 - Radiation levels	3.2	1
076 Service Water		X										K2.01 - Service water	2.7*	1
078 Instrument Air									X			A3.01 - Air pressure	3.1	1
103 Containment								X				A2.03 - Phase A and B isolation	3.5*	1
103 Containment											X	2.2.40 - Ability to apply Technical Specifications for a system.	3.4	1
K/A Category Totals:	**3**	**2**	**3**	**3**	**2**	**2**	**3**	**3**	**2**	**3**	**2**	**Group Point Total:**		**28**

PWR RO Examination Outline

Printed: 09/07/2015

Facility: Salem

ES - 401 **Plant Systems - Tier 2 / Group 2** **Form ES-401-2**

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
001 Control Rod Drive									X			A3.02 - Rod height	3.7	1
002 Reactor Coolant							X					A1.11 - Relative level indications in the RWST, the refueling cavity, the PZR and the reactor vessel during preparation for refueling	2.7	1
011 Pressurizer Level Control										X		A4.04 - Transfer of PZR LCS from automatic to manual control	3.2	1
016 Non-nuclear Instrumentation					X							K5.01 - Separation of control and protection circuits	2.7*	1
017 In-core Temperature Monitor				X								K4.02 - Sensing and determination of location core hot spots	3.1	1
027 Containment Iodine Removal		X										K2.01 - Fans	3.1*	1
028 Hydrogen Recombiner and Purge Control								X				A2.01 - Hydrogen recombiner power setting, determined by using plant data book	3.4*	1
033 Spent Fuel Pool Cooling			X									K3.03 - Spent fuel temperature	3.0	1
035 Steam Generator						X						K6.03 - S/G level detector	2.6	1
086 Fire Protection	X											K1.03 - AFW System	3.4*	1
K/A Category Totals:	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**Group Point Total:**		**10**

Generic Knowledge and Abilities Outline (Tier 3)

PWR RO Examination Outline

Printed: 09/07/2015

Facility: Salem

Form ES-401-3

Generic Category	KA	KA Topic	Imp.	Points
Conduct of Operations	2.1.3	Knowledge of shift or short-term relief turnover practices.	3.7	1
	2.1.25	Ability to interpret reference materials, such as graphs, curves, tables, etc.	3.9	1
	2.1.36	Knowledge of procedures and limitations involved in core alterations.	3.0	1
		Category Total:		**3**
Equipment Control	2.2.3	(multi-unit license) Knowledge of the design, procedural, and operational differences between units.	3.8	1
	2.2.14	Knowledge of the process for controlling equipment configuration or status.	3.9	1
	2.2.23	Ability to track Technical Specification limiting conditions for operations.	3.1	1
		Category Total:		**3**
Radiation Control	2.3.12	Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.	3.2	1
	2.3.15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	2.9	1
		Category Total:		**2**
Emergency Procedures/Plan	2.4.1	Knowledge of EOP entry conditions and immediate action steps.	4.6	1
	2.4.29	Knowledge of the emergency plan.	3.1	1
		Category Total:		**2**
		Generic Total:		**10**

Facility: Salem Printed: 09/07/2015

Date Of Exam: 12/21/2015

Tier	Group	RO K/A Category Points												SRO-Only Points					
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	A2			G*	Total	
1. Emergency & Abnormal Plant Evolutions	1	0	0	0	N/A			0	0	N/A		0	0	3			3	6	
	2	0	0	0				0	0			0	0	2			2	4	
	Tier Totals	0	0	0				0	0			0	0	5			5	10	
2. Plant Systems	1	0	0	0	0	0	0	0	0	0	0	0	0	3			2	5	
	2	0	0	0	0	0	0	0	0	0	0	0	0	0		2	1	3	
	Tier Totals	0	0	0	0	0	0	0	0	0	0	0	0	5			3	8	
3. Generic Knowledge And Abilities Categories		1			2			3			4		0	1	2	3	4	7	
		0			0			0			0			1	2	2	2		

Note:

1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).

2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.

3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.

4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.

5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.

6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.

7.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.

8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.

9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

PWR SRO Examination Outline

Printed: 09/07/2015

Facility: Salem

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1** **Form ES-401-2**

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
000022 Loss of Rx Coolant Makeup / 2						X	2.2.22 - Knowledge of limiting conditions for operations and safety limits.	4.7	1
000025 Loss of RHR System / 4						X	2.1.20 - Ability to interpret and execute procedure steps.	4.6	1
000038 Steam Gen. Tube Rupture / 3					X		EA2.17 - RCP restart criteria	4.4	1
000062 Loss of Nuclear Svc Water / 4						X	2.4.45 - Ability to prioritize and interpret the significance of each annunciator or alarm.	4.3	1
W/E04 LOCA Outside Containment / 3					X		EA2.1 - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	4.3	1
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4					X		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	4.3	1
K/A Category Totals:	**0**	**0**	**0**	**0**	**3**	**3**	**Group Point Total:**		**6**

PWR SRO Examination Outline

Printed: 09/07/2015

Facility: Salem

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2** **Form ES-401-2**

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
000003 Dropped Control Rod / 1						X	2.4.9 - Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.	4.2	1
000068 Control Room Evac. / 8					X		AA2.07 - PZR level	4.3	1
W/E06 Inad. Core Cooling / 4						X	2.4.23 - Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.	4.4	1
W/E10 Natural Circ. / 4					X		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.9	1
K/A Category Totals:	**0**	**0**	**0**	**0**	**2**	**2**	**Group Point Total:**		**4**

PWR SRO Examination Outline

Printed: 09/07/2015

Facility: Salem

ES - 401 **Plant Systems - Tier 2 / Group 1** **Form ES-401-2**

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
008 Component Cooling Water								X				A2.02 - High/low surge tank level	3.5	1
010 Pressurizer Pressure Control								X				A2.03 - PORV failures	4.2	1
022 Containment Cooling											X	2.2.42 - Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	4.6	1
026 Containment Spray								X				A2.08 - Safe securing of containment spray (when it can be done)	3.7	1
064 Emergency Diesel Generator											X	2.1.20 - Ability to interpret and execute procedure steps.	4.6	1
K/A Category Totals:	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**2**	**Group Point Total:**		**5**

PWR SRO Examination Outline

Printed: 09/07/2015

Facility: Salem

ES - 401 **Plant Systems - Tier 2 / Group 2** **Form ES-401-2**

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
014 Rod Position Indication								X				A2.02 - Loss of power to the RPIS	3.6	1
015 Nuclear Instrumentation											X	2.1.7 - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.7	1
075 Circulating Water								X				A2.02 - Loss of circulating water pumps	2.7	1
K/A Category Totals:	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**Group Point Total:**		**3**

Generic Knowledge and Abilities Outline (Tier 3)

PWR SRO Examination Outline

Printed: 09/07/2015

Facility: Salem

Form ES-401-3

Generic Category	KA	KA Topic	Imp.	Points
Conduct of Operations	2.1.41	Knowledge of the refueling process.	3.7	1
		Category Total:		**1**
Equipment Control	2.2.1	Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.	4.4	1
	2.2.38	Knowledge of conditions and limitations in the facility license.	4.5	1
		Category Total:		**2**
Radiation Control	2.3.11	Ability to control radiation releases.	4.3	1
	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.	3.8	1
		Category Total:		**2**
Emergency Procedures/Plan	2.4.32	Knowledge of operator response to loss of all annunciators.	4.0	1
	2.4.44	Knowledge of emergency plan protective action recommendations.	4.4	1
		Category Total:		**2**
		Generic Total:		**7**

Tier/Group	Randomly Selected K/A	Reason for Rejection
RO 1/1	009 EK2.03	Sampled on CERT exam
RO 1/1	015 2.1.39	(ES-401, D.1.b)
RO 1/1	026 2.1.41	(ES-401, D.1.b)
RO 1/1	027 2.1.36	(ES-401, D.1.b)
RO 1/1	027 2.4.16	(ES-401, D.1.b)
RO 1/1	038 2.1.26	(ES-401, D.1.b)
RO 1/1	065 AA2.07	Salem does not have backup nitrogen supply to instrument air.
RO 1/1	065 2.4.49	Loss of Instrument Air does not have any Immediate Actions.
RO 1/1	056 AA1.15	Salem does not have Service Water Booster pumps
RO 1/1	E05 2.1.38	(ES-401, D.1.b)
RO 1/2	005 2.1.21	(ES-401, D.1.b)
RO 1/2	061 2.4.12	(ES-401, D.1.b)
RO 1/2	068 2.2.17	(ES-401, D.1.b)
RO 1/2	E16 2.2.14	(ES-401, D.1.b)
RO 1/2	036 2.2.20	(ES-401, D.1.b)
RO 2/1	026 A3.02	Salem does not have Containment Spray heat exchangers.
RO 2/1	064 2.1.36	(ES-401, D.1.b)
RO 2/1	064 2.4.49	No immediate procedurally directed actions for operating EDGs
RO 2/1	073 2.1.40	(ES-401, D.1.b)
RO 2/1	076 A1.02	Salem does not have Reactor and Turbine Buildings closed loop cooling systems
RO 2/1	078 A3.01	Sampled on CERT exam
RO 2/1	103 2.1.26	(ES-401, D.1.b)

RO 2/2	001 K1.01	CRD system and CCW do not have any relationship
RO 2/2	015 2.4.42	(ES-401, D.1.b)
RO 2/2	033 A3.01	Salem does not have TCV for Spent Fuel temperature control.
RO2/2	055 2.1.39	(ES-401, D.1.b)
RO 2/2	068 K5.04	Generic Fundamentals for biological hazards of radiation
RO 3	2.3.5	More suited to operating exam
RO 3	2.1.31	Ability to locate more suited to operating exam
SRO 1/1	009 2.2.43	(ES-401, D.1.b)
SRO 1/1	029 2.2.17	(ES-401, D.1.b)
SRO 1/1	077 2.3.4	(ES-401, D.1.b)
SRO 1/2	061 2.2.17	(ES-401, D.1.b)
SRO 1/2	E02 2.2.6	(ES-401, D.1.b)
SRO 2/1	076 2.1.41	(ES-401, D.1.b)
SRO 2/2	033 2.1.40	(ES-401, D.1.b)
SRO 3	2.1.13	Plant Access control is General Employee Training and RO knowledge also.
SRO 3	2.4.1	RO level knowledge

Facility: **SALEM** Date of Examination: **12/14/15**

Examination Level: • RO SRO Operating Test Number: **14-01 NRC**

Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R,D	TCAF Adverse Environmental Conditions (Perform the Circulating Water Degradation Index and determine required unit status) 2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc.
Conduct of Operations	R,M	Determine the CSD boron concentration and calculate the boron addition required for a natural circulation cooldown 2.1.43 Ability to use procedures to determine the effects on reactivity of plant changes, such as reactor coolant system temperature, secondary plant, fuel depletion, etc.
Equipment Control	R,N	Review completed surveillance 2.2.37 Ability to determine operability and/or availability of safety related equipment RO-3.6
Radiation Control		N/A
Emergency Procedures / Plan	S,P	Activate ERDS during an ALERT 2.4.43 Knowledge of emergency communications systems and techniques. RO-3.2

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.

*Type Codes and Criteria (C)ontrol Room, (S)imulator, or Class(R)oom
(D)irect from bank, (≤3 for ROs; ≤4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥1)
(P)revious 2 exams (≤1; randomly selected)

Facility: **SALEM** Date of Examination: **12/14/15**

Examination Level: RO • SRO Operating Test Number: **14-01 NRC**

Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R,M	Determine the required actions based on abnormal Secondary Plant chemistry conditions. 2.1.34 Knowledge of primary and secondary plant chemistry limits. SRO-3.5
Conduct of Operations	R,D	Determine the TSAS for a dropped rod and complete the applicable log 2.1.18 Ability to make accurate, clear, and concise logs, records, status boards, and reports. SRO-3.8
Equipment Control	R,N	Review completed surveillance for operability. 2.2.37 Ability to determine operability and/or availability of safety related equipment SRO-4.6
Radiation Control	R,D	Select release path (and mark up prints) for Radioactive Liquid Release. 2.3.6 Ability to approve release permits SRO-3.8
Emergency Procedures / Plan	S,M,P	Classify Emergency / Non-Emergency Events, and complete the ICMF. 2.4.29 Knowledge of the Emergency Plan SRO 4.4

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.

*Type Codes and Criteria

(C)ontrol Room, (S)imulator, or Class(R)oom
(D)irect from bank, (≤3 for ROs; ≤4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥1)
(P)revious 2 exams (≤1; randomly selected)

Facility: **SALEM**	Date of Examination: **12/14/15**
Exam Level : RO SRO-I	Operating Test No.: **14-01 NRC**

Control Room Systems@ (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U, including 1 ESF)

System / JPM Title	Type Code*	Safety Function
a) Respond to successive dropped control rods at power	A,D,S	1
b) TCAF LT-112 failure, perform manual blended M/U	D,S	2
c) Raise ECCS Accumulator Level and Pressure	M,S	3
d) Perform Main Turbine Valve Testing	A,N,S	4 (sec)
e) Transfer 4KV Group Buses to APT, trip Rx upon ATWT	A,D,S	6
f) TCAF Undercompensated IR NI channel in TRIP-2	A,L,D,S	7
g) TCAF loss of the CCW system	EN,D,S	8
h) TCAF loss of RHR in SDC mode	D,L,S	4 (pri)
In-Plant Systems (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)		
i) Perform Containment Spray Eductor line flushing (can make Alt path if want)	N,R	5
j) Locally manually isolate RCP seal injection during LOPA	D,E,R	4 (pri)
k) Prepare a Waste Gas Decay Tank for Release	N,R	9

@ All RO and SRO-I control room (and in plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions ; in-plant systems and functions may overlap those tested in the control room.

*Type Codes:	Criteria for RO/ SRO-I/SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	≥ 1 / ≥ 1 / ≥ 1 (control room system)
(L)ow-Power / Shutdown	≥ 1 / ≥1 / ≥1
(N)ew or (M)odified from bank including 1 (A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

Facility: SALEM 1 & 2 Scenario No.: ESG-1 Op-Test No.: 14-01 NRC

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 68% power, BOL. 25 CFCU C/T for bearing replacement. Power is being raised at 10% per hour. Control Bank D is at 152 steps withdrawn. Xenon is burning out at 60 pcm per hour. 23 Condensate pump is O/S.

Turnover: Raise power from 68%-90% @ 10% per hour.

Event No.	Malf. No.	Event Type*	Event Description
1		R CRS / RO N PO	Power ascension
2	NI0193D	I ALL	PRNI fails high (TS)
3	RC0002	C ALL	20 gpm RCS leak (TS) (all operators respond, PO will perform CVCS letdown operations)
4	RC0001B	M ALL	LBLOCA
5	RP0108	C RO	SI fails to auto actuate
6	RP318A RP318B	C ALL	Both RHR pumps fail to start on SEC signal
7	O/R C812 O/R C809	C ALL	2C 4KV vital bus UV following SEC reset
8	CV62B	C CRS / RO	Charging pump cavitation while isolating RWST
			CT's: #1-Start Low Head ECCS, #2- Transfer to Cold Leg Recirc, #3 Trip cavitating charging pump.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: SALEM 1 & 2 Scenario No.: ESG-2 Op-Test No.: 14-01 NRC

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 100% power, MOL. Solar flares are occurring. SMD K-5 is in effect for next 4 hours. 26 SW pump is C/T for strainer cleaning.

Turnover: Maintain current power.

Event No.	Malf. No.	Event Type*	Event Description
1	O/R AG01	C CRS/RO	21 Aux Building Exhaust fan trip (TS 3.7.7)
2	PR0016A	I CRS / RO	PZR pressure channel fails low (TS)
3	AN3901	R ALL	Main Generator Radio Frequency hi
4	AN0529 AN0316	M ALL	MPT sudden pressure / Fire protection water deluge actuation
5	AF0353C AF0182A	C CRS / PO	Failure of AFW initiation
6	REM FP07D	I ALL	2nd PZR pressure channel fails low
7	SG0078D	C ALL	SGTR
			CT's:#1 Terminate SI (crit act time 25 min) #2 Re-establish letdown within 45 minutes.(crit act time)

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: SALEM 1 & 2 Scenario No.: ESG-3 Op-Test No.: 14-01 NRC

Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: 85% power, BOL. 22 Charging pump C/T for biofouling. 26 SW pump is C/T for strainer cleaning. 23 Condensate pump C/T.
Turnover: Power is reduced due to 23 condensate pump trip last shift. Maintain current power.

Event No.	Malf. No.	Event Type*	Event Description
1	SW0222E	N/A	25 SW pump strainer high D/P (TS)
2	VC0087C VL0337 VC0087A CN0086B	C CRS / PO	Condenser vacuum pump trips
3		R ALL	Degrading condenser vacuum
4	RD0065	C CRS / RO	Stuck control rod (TS)
5	CN0117B	M ALL	22 Condensate pump trip
6	O/R C808 O/R C805	C ALL	2B 4KV vital bus UV, SEC loading in blackout.
7	RP318S1 CV0208A RP318E2	C ALL	Various equipment fails to start on SEC initiation
8	AF0183	C ALL	Loss of remaining AFW pump
			CT#1 Initiate RCS Bleed and Feed, CT#2 Close all PZR PORVs and head vent valves

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: SALEM 1 & 2 Scenario No.: ESG-4 Op-Test No.: 14-01 NRC

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 100% power, EOL. Personnel are in containment for surveys.

Turnover: Maintain current conditions.

Event No.	Malf. No.	Event Type*	Event Description
1		N/A	Airlock door failure (TS)
2		C CRS / PO	CCW pump trip (TS)
3		R ALL	Steam leak outside containment / power reduction
4		M ALL	Steamline rupture
5		C CRS / RO	2 stuck rods post trip
6		C CRS / RO	Containment air isolation valves fail to shut on SI initiation
7		C RO	Train B SI operate keyswitch fails to operate
8		C ALL	LOCA outside containment
			CTs #1 Borate for 2 stuck rods CT#2 Terminate LOCA outside containment

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor