

Facility: Salem

Printed: 01/17/2010

Date Of Exam: 05/14/2010

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	0	2	2	4
	Tier Totals	0	0	0				0	0				0	0	0	0	5	5
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				2	2	1	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: 01/17/2010

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		AA2.02 - Position of emergency boration valve	4.2	1
000076 High Reactor Coolant Activity / 9						X	2.4.41 - Knowledge of the emergency action level thresholds and classifications.	4.6	1
W/E06 Inad. Core Cooling / 4					X		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	4.1	1
W/E14 Loss of CTMT Integrity / 5						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
K/A Category Totals:	0	0	0	0	2	2		Group Point Total:	4

PWR SRO Examination Outline

Printed: 01/17/2010

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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
006 Emergency Core Cooling								X				A2.12 - Conditions requiring actuation of ECCS	4.8	1
022 Containment Cooling								X				A2.01 - Fan motor over-current	2.7	1
026 Containment Spray											X	2.3.11 - Ability to control radiation releases.	4.3	1
061 Auxiliary/Emergency Feedwater											X	2.4.20 - Knowledge of operational implications of EOP warnings, cautions, and notes.	4.3	1
064 Emergency Diesel Generator								X				A2.04 - Unloading prior to securing an ED/G	3.0	1
K/A Category Totals:	0	3	0	0	2	Group Point Total:	5							

PWR SRO Examination Outline

Printed: 01/17/2010

Facility: Salem

Plant Systems - Tier 2 / Group 2

Form ES-401-2

ES - 401

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
016 Non-nuclear Instrumentation								X				A2.02 - Loss of power supply	3.2*	1
033 Spent Fuel Pool Cooling								X				A2.03 - Abnormal spent fuel pool water level or loss of water level	3.5	1
071 Waste Gas Disposal											X	2.2.18 - Knowledge of the process for managing maintenance activities during shutdown operations, such as risk assessments, work prioritization, etc.	3.9	1
K/A Category Totals:	0	2	0	0	1	Group Point Total:	3							

Generic Knowledge and Abilities Outline (Tier 3)

PWR SRO Examination Outline

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Facility: Salem

Form ES-401-3

<u>Generic Category</u>	<u>KA</u>	<u>KA Topic</u>	<u>Imp.</u>	<u>Points</u>
Conduct of Operations	2.1.20	Ability to interpret and execute procedure steps.	4.6	1
	2.1.25	Ability to interpret reference materials, such as graphs, curves, tables, etc.	4.2	1
	Category Total:			2
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
	2.2.25	Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.	4.2	1
	Category Total:			2
Radiation Control	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.	3.7	1
	Category Total:			1
Emergency Procedures/Plan	2.4.27	Knowledge of "fire in the plant" procedure.	3.9	1
	2.4.49	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.4	1
	Category Total:			2
Generic Total:				7

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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	2	N/A			1	2	N/A		0	9	0	0	0	
	Tier Totals	5	5	5	N/A			4	5	N/A		3	27	0	0	0	
2. Plant Systems	1	3	2	3	3	3	2	3	3	1	3	2	28	0	0	0	
	2	1	1	1	1	1	1	1	1	1	1	0	10	0	0	0	
	Tier Totals	4	3	4	4	4	3	4	4	2	4	2	38	0	0	0	
3. Generic Knowledge And Abilities Categories				1		2		3		4		10	1	2	3	4	0
				2		3		3		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 RC 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: 01/17/2010

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					EK2.02 - Breakers, relays and disconnects	2.6	1
000008 Pressurizer Vapor Space Accident / 3	X						AK1.01 - Thermodynamics and flow characteristics of open or leaking valves	3.2	1
000009 Small Break LOCA / 3				X			EA1.14 - Secondary pressure control	3.4	1
000011 Large Break LOCA / 3				X			EA1.13 - Safety injection components	4.1*	1
000015/000017 RCP Malfunctions / 4		X					AK2.07 - RCP seals	2.9	1
000022 Loss of Rx Coolant Makeup / 2					X		AA2.02 - Charging pump problems	3.2	1
000025 Loss of RHR System / 4				X			AA1.09 - LPI pump switches, ammeter, discharge pressure gauge, flow meter, and indicators	3.2	1
000026 Loss of Component Cooling Water / 8						X	2.1.45 - Ability to identify and interpret diverse indications to validate the response of another indication.	4.3	1
000029 ATWS / 1						X	2.4.14 - Knowledge of general guidelines for EOP usage.	3.8	1
000038 Steam Gen. Tube Rupture / 3			X				EK3.06 - Actions contained in EOP for RCS water inventory balance, S/G tube rupture, and plant shutdown procedures	4.2	1
000040 Steam Line Rupture - Excessive Heat Transfer / 4			X				AK3.03 - Steam line non-return valves	3.2*	1
000055 Station Blackout / 6					X		EA2.03 - Actions necessary to restore power	3.9	1
000056 Loss of Off-site Power / 6					X		AA2.35 - Reactor trip alarm	4.1	1
000065 Loss of Instrument Air / 8			X				AK3.04 - Cross-over to backup air supplies	3.0	1
000077 Generator Voltage and Electric Grid Disturbances / 6	X						AK1.02 - Over-excitation	3.3	1
W/E04 LOCA Outside Containment / 3	X						EK1.2 - Normal, abnormal and emergency operating procedures associated with LOCA Outside Containment	3.5	1
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4		X					EK2.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.7	1

PWR RO Examination Outline

Printed: 01/17/2010

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/E11 Loss of Emergency Coolant Recirc. / 4						X	2.4.5 - Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions.	3.7	1
K/A Category Totals:	3	3	3	3	3	3		Group Point Total:	18

PWR RO Examination Outline

Printed: 01/17/2010

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					AK2.06 - T-ave./ref. deviation meter	3.0*	1
000003 Dropped Control Rod / 1			X				AK3.04 - Actions contained in EOP for dropped control rod	3.8*	1
000005 Inoperable/Stuck Control Rod / 1			X				AK3.02 - Rod insertion limits	3.6	1
000032 Loss of Source Range NI / 7					X		AA2.03 - Expected values of source range indication when high voltage is automatically removed	2.8	1
000036 Fuel Handling Accident / 8					X		AA2.01 - ARM system indications	3.2	1
000068 Control Room Evac. / 8		X					AK2.01 - Auxiliary shutdown panel layout	3.9	1
000076 High Reactor Coolant Activity / 9				X			AA1.04 - Failed fuel-monitoring equipment	3.2	1
W/E02 SI Termination / 3	X						EK1.2 - Normal, abnormal and emergency operating procedures associated with SI Termination	3.4	1
W/E06 Inad. Core Cooling / 4	X						EK1.2 - Normal, abnormal and emergency operating procedures associated with Degraded Core Cooling	3.5	1
K/A Category Totals:	2	2	2	1	2	0		Group Point Total:	9

PWR RO Examination Outline

Printed: 01/17/2010

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							K5.05 - The dependency of RCS flow rates upon the number of operating RCPs	2.8*	1
003 Reactor Coolant Pump				X								K4.04 - Adequate cooling of RCP motor and seals	2.8	1
004 Chemical and Volume Control							X					A1.10 - Reactor power	3.7	1
005 Residual Heat Removal		X										K2.01 - RHR pumps	3.0	1
006 Emergency Core Cooling				X								K4.16 - Interlocks between RHR valves and RCS	3.2	1
006 Emergency Core Cooling										X		A4.01 - Pumps	4.1	1
007 Pressurizer Relief/Quench Tank			X									K3.01 - Containment	3.3	1
008 Component Cooling Water								X				A2.04 - PRMS alarm	3.3	1
010 Pressurizer Pressure Control	X											K1.03 - RCS	3.6	1
010 Pressurizer Pressure Control		X										K2.03 - Indicator for PORV position	2.8*	1
012 Reactor Protection								X				A2.03 - Incorrect channel bypassing	3.4	1
012 Reactor Protection	X											K1.02 - 125V dc system	3.4	1
013 Engineered Safety Features Actuation					X							K5.02 - Safety system logic and reliability	2.9	1
013 Engineered Safety Features Actuation						X						K6.01 - Sensors and detectors	2.7*	1
022 Containment Cooling									X			A3.01 - Initiation of safeguards mode of operation	4.1	1
026 Containment Spray								X				A2.05 - Failure of chemical addition tanks to inject	3.7	1
039 Main and Reheat Steam			X									K3.04 - MFW pumps	2.5*	1
059 Main Feedwater			X									K3.03 - S/Gs	3.5	1
061 Auxiliary/Emergency Feedwater											X	2.2.42 - Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	3.9	1
061 Auxiliary/Emergency Feedwater					X							K5.03 - Pump head effects when control valve is shut	2.6	1
062 AC Electrical Distribution										X		A4.03 - Synchroscope, including an understanding of running and incoming voltages	2.8	1
063 DC Electrical Distribution							X					A1.01 - Battery capacity as it is affected by discharge rate	2.5	1
064 Emergency Diesel Generator						X						K6.07 - Air receivers	2.7	1

PWR RO Examination Outline

Printed: 01/17/2010

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										K2.01 - One-line diagram of power supply to M/G sets	3.5	1
002 Reactor Coolant			X									K3.03 - Containment	4.2	1
011 Pressurizer Level Control								X				A2.11 - Failure of PZR level instrument - low	3.4	1
015 Nuclear Instrumentation							X					A1.06 - Fuel burnup	2.5*	1
027 Containment Iodine Removal										X		A4.03 - CIRS fans	3.3*	1
028 Hydrogen Recombiner and Purge Control					X							K5.03 - Sources of hydrogen within containment	2.9	1
033 Spent Fuel Pool Cooling									X			A3.02 - Spent fuel leak or rupture	2.9	1
034 Fuel Handling Equipment						X						K6.02 - Radiation monitoring systems	2.6	1
035 Steam Generator	X											K1.12 - RPS	3.7	1
086 Fire Protection				X								K4.02 - Maintenance of fire header pressure	3.0	1
K/A Category Totals:	1	0	Group Point Total:	10										

Generic Knowledge and Abilities Outline (Tier 3)

PWR RO Examination Outline

Printed: 01/17/2010

Facility: Salem

Form ES-401-3

<u>Generic Category</u>	<u>KA</u>	<u>KA Topic</u>	<u>Imp.</u>	<u>Points</u>
Conduct of Operations	2.1.1	Knowledge of conduct of operations requirements.	3.8	1
	2.1.18	Ability to make accurate, clear, and concise logs, records, status boards, and reports.	3.6	1
	Category Total:			2
Equipment Control	2.2.2	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.	4.6	1
	2.2.39	Knowledge of less than or equal to one hour Technical Specification action statements for systems.	3.9	1
	2.2.43	Knowledge of the process used to track inoperable alarms.	3.0	1
	Category Total:			3
Radiation Control	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.	3.2	1
	2.3.7	Ability to comply with radiation work permit requirements during normal or abnormal conditions.	3.5	1
	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.	3.4	1
	Category Total:			3
Emergency Procedures/Plan	2.4.12	Knowledge of general operating crew responsibilities during emergency operations.	4.0	1
	2.4.46	Ability to verify that the alarms are consistent with the plant conditions.	4.2	1
	Category Total:			2

Generic Total: 10

Facility: <u>SALEM</u>		Date of Examination: <u>05/10/10</u>
Examination Level: RO • SRO		Operating Test Number: <u>08-01 NRC</u>
Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R,D	Operate the Chilled Water System (Identify and Isolate Non-Essential Heat Loads) 2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc.
Conduct of Operations	R,M	Evaluate a shift staffing situation and take corrective action IAW administrative procedures 2.1.5 Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.
Equipment Control	S,N	Walkdown control console and determine most limiting LCO for current Mode of operation. 2.2.42 Ability to recognize system parameters that are entry level conditions for Technical Specifications SRO 4.6
Radiation Control	R,N	Review Radioactive Liquid Waste Release preparations and select release path 2.3.6 Ability to approve release permits SRO-3.8
Emergency 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: 05/10/10
Exam Level : RO SRO-I SRO-U	Operating Test No.: 08-01 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 (003 AA2.03 RO-3.6 SRO-3.8)	D,S,A	1
b. Perform EOP-TRIP-1 Immediate Actions and initiate Safety Injection based on board indication after auto SI fails to actuate (Normal Rx trip from 20% power entering an outage and fail steam dumps open with no first out of SI) (EPE 007 EA2.02 RO-4.3 SRO-4.6)	A, EN, N	2
c. Respond to an unwarranted PZR Overpressure Protection System (POPS) actuation. (010 A4.03 RO-4.0 SRO-3.8)	A, N, L	3
d. Respond to a Shutdown LOCA (2.4.9 RO-3.8 SRO-4.2)	D,S,L	4 (pri)
e. Perform stroke time testing of 21MS167 (Main Steamline Isolation Valve) (039 A4.01 RO-2.9 SRO-2.8)	D, EN, S	4 (sec)
f. Perform a CFCU Operability and Service Water Flow Verification (022 A4.01 RO-3.6 SRO-3.6)	D,S,P	5
g. Start an EDG from the control room and energize an isolated vital bus (064 A4.01 RO-4.0 SRO-4.3)	L,N,S	6
h. Failure of Permissive P-6 to block Source Range Hi Flux trip during Rx S/U (012 A4.03 RO-3.6 SRO-3.6)	A, D, L, S	7

In-Plant Systems (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)

i. Reset TDAFW pump steam inlet trip valve 2MS52 (APE 068 AA1.02 RO-4.3 SRO-4.5)	D, E, R	4 (sec)
j. Start the SBO Air Compressor (2.1.23 RO-4.3 SRO-4.4)	D,E	8
k. Commence a liquid waste release, and respond to high activity during the release (2.3.11 RO-3.8 SRO-4.3)	D, R, A,P	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 (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	

Rev 1/22/10

Facility: SALEM	Date of Examination: 05/10/10
Exam Level : RO SRO-I SRO-U	Operating Test No.: 08-01 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 (003 AA2.03 RO-3.6 SRO-3.8)	D,S,A	1
b. Calculate actual RCS subcooling during performance of LOCA-1(Static) (2.1.45 RO-4.3 SRO-4.3)	A,M,L	2
c. Perform EOP-TRIP-1 Immediate Actions and initiate Safety Injection based on board indication after auto SI fails to actuate (Normal Rx trip from 20% power entering an outage and fail steam dumps open with no first out of SI) (EPE 007 EA2.02 RO-4.3 SRO-4.6)	A, EN, N	3
d. Respond to a Shutdown LOCA (2.4.9 RO-3.8 SRO-4.2)	D,S,L	4 (pri)
e. Perform stroke time testing of 21MS167 (Main Steamline Isolation Valve) (039 A4.01 RO-2.9 SRO-2.8)	D, EN, S	4 (sec)
f. Perform a CFCU Operability and Service Water Flow Verification (022 A4.01 RO-3.6 SRO-3.6)	D,S,P	5
g. Start an EDG from the control room and energize an isolated vital bus (064 A4.01 RO-4.0 SRO-4.3)	L,N,S	6
h. Failure of Permissive P-6 to block Source Range Hi Flux trip during Rx S/U (012 A4.03 RO-3.6 SRO-3.6)	A, D, L, S	7

In-Plant Systems (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)

i. Reset TDAFW pump steam inlet trip valve 2MS52 (APE 068 AA1.02 RO-4.3 SRO-4.5)	D, E, R	4 (sec)
j. Start the SBO Air Compressor (2.1.23 RO-4.3 SRO-4.4)	D,E	8
k. Commence a liquid waste release, and respond to high activity during the release (2.3.11 RO-3.8 SRO-4.3)	D, R, A	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 (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	

Rev 0

Facility: **SALEM** Date of Examination: **05/10/10**
 Exam Level : RO SRO-I SRO-U Operating Test No.: **08-01 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.		
c b		
a b Perform EOP-TRIP-1 Immediate Actions and initiate Safety Injection based on board indication after auto SI fails to actuate (Normal Rx trip from 20% power entering an outage and fail steam dumps open with no first out of SI) (EPE 007 EA2.02 RO-4.3 SRO-4.6)	A, EN, N	3 2
d. Respond to a Shutdown LOCA (2.4.9 RO-3.8 SRO-4.2)	D,S,L	4 (pri)
e.		
f.		
g.		
h. Failure of Permissive P-6 to block Source Range Hi Flux trip during Rx S/U (012 A4.03 RO-3.6 SRO-3.6)	A, D, L, S	7

In-Plant Systems (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)

i.		
j. Start the SBO Air Compressor (2.1.23 RO-4.3 SRO-4.4)	D,E	8
k. Commence a liquid waste release, and respond to high activity during the release (2.3.11 RO-3.8 SRO-4.3)	D, R, A	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 (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	

REV 0

Facility: **SALEM** Date of Examination: **05/10/10**
 Exam Level : RO SRO-I SRO-U Operating Test No.: **08-01 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 (003 AA2.03 RO-3.6 SRO-3.8)	D,S,A	1
b. Calculate actual RCS subcooling during performance of LOCA-1(Static) (2-1.45 RO-4.3 SRO-4.3) (See RO 301-2 JPM c)	M A,M,L	2 3
c. Perform EOP-TRIP-1 Immediate Actions and initiate Safety Injection based on board indication after auto SI fails to actuate (Normal Rx trip from 20% power entering an outage and fail steam dumps open with no first out of SI) (EPE 007 EA2.02 RO-4.3 SRO-4.6) b.	A, EN, N	2 2
d. Respond to a Shutdown LOCA (2.4.9 RO-3.8 SRO-4.2)	D,S,L	4 (pri)
e.		
f. Perform a CFCU Operability and Service Water Flow Verification (022 A4.01 RO-3.6 SRO-3.6)	D,S,P	5
g. Start an EDG from the control room and energize an isolated vital bus (064 A4.01 RO-4.0 SRO-4.3)	L,N,S	6
h. Failure of Permissive P-6 to block Source Range Hi Flux trip during Rx S/U (012 A4.03 RO-3.6 SRO-3.6)	A, D, L, S	7

In-Plant Systems (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)

i. Reset TDAFW pump steam inlet trip valve 2MS52 (APE 068 AA1.02 RO-4.3 SRO-4.5)	D, E, R	4 (sec)
j. Start the SBO Air Compressor (2.1.23 RO-4.3 SRO-4.4)	D,E	8
k. Commence a liquid waste release, and respond to high activity during the release (2.3.11 RO-3.8 SRO-4.3)	D, R, A	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 (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	

Rev 0

Facility: SALEM 1 & 2Scenario No.: ESG-1Op-Test No.: 08-01 NRC

Examiners: _____

Operators: _____

Initial Conditions: 90% power, MOL. 23 SW pp C/T for strainer repair.

Turnover: Raise Rx power to 100%

Event No.	Malf. No.	Event Type*	Event Description
1		^{N-CRS/PO} R-RC ALL	Raise power
2		I CRS/RO	Tavg channel fails high (Tech Specs)
3		C CRS/PO	#4 SW Bay leak, leak isolation requires isolating all #4 Bay SW pps, with 23SW pp C/T (TS 3.0.3 entry)
4		^{M-C} CRS/RO	RCP #1 seal degradation leading to failure
5		C CRS/PO	2A 4KV vital bus de-energizes on Rx trip, EDG output bkr does not shut, no SW pumps are running
6		^{S-M} ALL	SBLOCA
7		C ALL	SEC controlled equipment fails to start (22 SI pp)
8		C ALL	Loss of Off-Site power after SI reset

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

Facility: SALEM 1 & 2 Scenario No.: ESG-2 Op-Test No: 08-01 NRC

Examiners: _____ Operators: _____

Initial Conditions: 100% power, BOL, PZR level CH III selected for control due to CH I indication problem. Rod Control in manual due to PT-505 channel calibration in progress. 21 Heater Drain Tank pump O/S due to oil leak. 22 Condensate pump has elevated vibration.

Turnover: Reduce power at 30% per hour to 79% in preparation for removing 22 Condensate Pump from service.

Event No.	Malf. No.	Event Type*	Event Description
1		R-RO N-CRS/PO ALL	Perform power reduction
2		C CRS	CFCU trip (Tech Specs)
3		I CRS / RO	VCT level ch fails high
4		C CRS/RO	Operating charging pump cavitation (Tech Specs)
5		M ALL	22 Cond pump trip, loss of SGFP suction pressure
6		C RO	MainTurbine fails to trip initially, MSLI successful
7		C CRS/PO	21 AFW pump will not start, 22 AFW pp pressure override defeat failure, 23 AFW pp trips. FRHS with condensate pump recovery.

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

Facility: SALEM 1 & 2 Scenario No.: ESG-3 Op-Test No.: 08-01 NRC

Examiners: _____ Operators: _____

Initial Conditions: 4.8% power, MOL, Main Turbine is on the Turning Gear. Rx startup by Control Rods was performed. 21 AFW pp is C/T. 2PR1 PZR PORV is leaking, 2PR6 is shut with power applied to comply with Tech Specs.

Turnover: Raise Rx power to 17% over the next 30 minutes in preparation for rolling the Main Turbine. Reactivity plan developed by Rx Engineering directs raising power with control rods only

Event No.	Malf. No.	Event Type*	Event Description
1		R-RO N-CRS ALL PO	Raise Rx power
2		I CRS / RO	PZR pressure instrument fails high (Tech Spec)
3		C CRS / PO	ECCS Accumulator low pressure (Tech Specs)
4		M ALL	Rapid degradation of condenser vacuum/loss of steam dumps with power above capacity of SG Atmospheric reliefs.
5		C-CRS ALL PO	Rod Control failure results in no inward rod movement or Rx trip available - ATWT / FRSM
6		C CRS/RO	Rapid Borate Stop valve fails to open
7		C CRS/RO	PZR PORV fails open.

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

SPARE

Facility: SALEM 1 & 2 Scenario No.: ESG-4 (Spare) Op-Test No.: 08-01 NRC

Examiners: _____ Operators: _____

Initial Conditions: Rx power is 67%, BOL. Power is reduced due to 21MS29 Main Turbine Governor Valve failed shut 1 hour ago. 2PS1 is leaking and its manual isolation valve is shut. 2PR1 is leaking and its block valve is shut with power applied

Turnover: Maintain current power while 21MS29 failure is investigated.

Event No.	Malf. No.	Event Type*	Event Description
1		I ALL	Controlling PZR level channel fails low (Tech Specs)
23		C PO	2 nd turbine governor valve (23MS29) fails closed
3		N ALL	Power reduction to <30% power (Tech Spec-AFD)
4		C ALL ^{RO}	Steam leak downstream of MSIVs
5		M ALL	Steam rupture with failed open MSIV
6		C CRS / PO	SGTR following affected SG de-pressurization

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

2

C-PO

AFW Auto M/V valve fails open