

September 27, 2006
NTD-06-074

Mr. Joseph M. D'Antonio
Chief Examiner
Division of Reactor Safety
US Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA. 19406-1415

Dear Mr. D'Antonio,

Salem Initial License Examination Outline

Enclosed is our proposed outline for the initial license examination to be conducted for Salem candidates during a two-week period beginning on December 11, 2006. These materials should be withheld from public disclosure until after the examinations are complete. Included are:

- Form ES-201-2, Examination Outline Quality Checklist.
- Form ES-301-1, Administrative Topics Outline.
- Form ES-301-2, Control Room Systems / In-Plant System Outline.
- Form ES-301-5, (2 pages), Transient and Event Checklist.
- Form ES-D-1, (4 pages), Appendix D, Scenario Outline.
- Form ES-401-2, PWR Examination Outline: Separate forms are completed for the RO and SRO sections of the examinations.
- Form ES-401-4, Record of Rejected K/As. Please note that when the latest version of the Random Exam Generation software was uploaded into our system, the previously NRC approved suppressed K/A's were un-suppressed, therefore ALL K/A's were subject to selection. Additionally, the RO examination was generated with a previous version of the Exam Generation software, (prior to the release of the current version), hence the relatively high number of K/A's rejected due to over sampling.

The examination team is currently drafting all portions of the examination.

If you have any questions or comments, please call me at 856-339-2215. The Lead Exam Author, Gerry Gauding, may be contacted as needed at 856-339-1554.

Sincerely,



Marios Kafantaris
Salem Operations Training Manager

October 18, 2006

Mr. Joseph M. D'Antonio
Chief Examiner
Division of Reactor Safety
US Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA. 19406-1415

Dear Mr. D'Antonio,

Salem Initial License Examination Outline

Enclosed is our revised outline for the initial license examination to be conducted for Salem candidates during a two-week period beginning on December 11, 2006. These materials should be withheld from public disclosure until after the examinations are complete. Included are:

- Form ES-301-1, Administrative Topics Outline.
- Form ES-301-5, (2 pages), Transient and Event Checklist.
- Form ES-D-1, (2 pages), Appendix D, Scenario Outline.

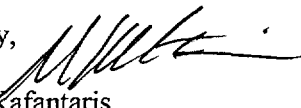
Additionally, there is also:

1. An explanation of the random selection process used in conjunction with deleted K/A replacement.
2. Explanation for ESG #1, Event # 7, Instrument Failure.

The examination team is currently drafting all portions of the examination.

If you have any questions or comments, please call me at 856-339-2215. The Lead Exam Author, Gerry Gauding, may be contacted as needed at 856-339-1554.

Sincerely,


Marios Kafantaris
Salem Operations Training Manager

Facility: <u>SALEM</u>		Date of Examination: <u>12/11/2006</u>
Examination Level: <input type="checkbox"/> RO <input checked="" type="checkbox"/> SRO		Operating Test Number: <u>INDIA ILT NRC</u>

Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R,M	Review a completed surveillance to calculate the Quadrant Power Tilt Ratio. (K/A 2.1.7 SRO-4.4)
Conduct of Operations	R,M	Review a completed Shutdown Margin calculation. (K/A 2.1.25 SRO 3.1)
Equipment Control	R, M	(K/A 2.2.13SRO 3.8) – Knowledge of tagging and clearance procedures Evaluate a tagging request.
Radiation Control	P, D	Determine Radiological Conditions For Personnel Exposure Using a Room Survey Map. 2.3.10 Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure. (SRO 3.1)
Emergency Plan	S,N	Classify Emergency / Non-Emergency Events, and complete the ICMF. (K/A 2.4.29 SRO-4.0)

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)
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Facility: SALEM 1 & 2 Scenario No.: NRC #2 Op-Test No.: India

Examiners: _____ Operators: _____

Initial Conditions: 4% Rated Thermal Power

Turnover: Unit at 4% power returning from a forced outage due to DEHC problems. All approvals and surveillances are complete and approval to proceed to mode 1 has been given. Orders to the shift is to raise power in preparation for placing turbine on line

Event No.	Malf. No.	Event Type*	Event Description
1	_____	N/R CRS/PO/RO	Raise power to 18% to place turbine on line
2	REM: MC12D	TS CRS	Loss of Tripping Capability B Rx Trip Breaker (TS CRS)
3	CV0034 VL0245	C/C CRS/RO	23 charging pump trips and Letdown valve fails to close (TS CRS)
4	EL0102	C CRS/RO/PO	Failure of 3 Station Power Transformer (TS CRS)
5	RC0002	M ALL	Small Break LOCA
6	RP0108	C CRS/RO	Auto SI fails to actuate
7	RPO0342	C ALL	2SJ12-BIT Outlet Valve fails to Auto open on SEC signal
8	EL0134	C CRS/RO/PO	Loss of Off-Site Power ECCS restoration

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

Facility: SALEM 1 & 2 Scenario No.: NRC #3 Op-Test No.: India

Examiners: _____ Operators: _____

Initial Conditions: 100% Rated Thermal Power BOL

Turnover: Unit at 100% power, 21 AFW pump is tagged for emergent work to inboard bearing, Solar Magnetic Disturbances have been occurring currently at K-3, river grass loading very heavy at last tide change, high tide in 2 hours.

Event No.	Malf. No.	Event Type*	Event Description
1	EL12A	N/R CRS/PO/RO	Power Red to 80% due to Grid Disturbance(SMD)
2	RC0014B	I/R CRS/RO	22 Loop Thot fails during downpower (TS CRS)
3	CC0329	C CRS/PO	CCW leak on 21 CCW header (TS CRS)
4	AN0529	C CRS/RO	Major Oil Leak at MPT
5	RP0069 RP0073 RP0279A RP0279B	C ALL	Main Turbine fails to Trip/Manual MSLI required
6	AF0181B	C CRS/PO	22 AFW pump trips after AFW throttled
7	AF0183	M/C All	23 AFW pp trips, Loss of Heat Sink, CN pump recovery

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

Facility: Salem Generating Station

Printed: 09/01/2006

Date Of Exam: 12/11/2020

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			4	3	N/A			2	18	0		0	0
	2	2	2	1				2	2				0	9	0		0	0
	Tier Totals	5	5	4				6	5				2	27	0		0	0
2. Plant Systems	1	3	1	3	3	2	3	2	3	2	3	3	28	0		0	0	
	2	1	1	0	1	1	0	1	3	1	1	0	10	0	0	0	0	
	Tier Totals	4	2	3	4	3	3	3	6	3	4	3	38	0		0	0	
3. Generic Knowledge And Abilities Categories				1		2		3		4		10		1	2	3	4	0
				2		2		3		3				0	0	0	0	

Note:

1. Ensure that at least two topics from every 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 that are not included on the outline should be added. Refer to ES-401, Attachment 2, 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.
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: 09/01/2006

Facility: Salem Generating Station

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						EK1.03 - Reasons for closing the main turbine governor valve and the main turbine stop valve after a reactor trip	3.7	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						EK1.02 - Use of steam tables	3.5	1
000011 Large Break LOCA / 3		X					EK2.02 - Pumps	2.6*	1
000015/000017 RCP Malfunctions / 4				X			AA1.11 - RCP on/off and run indicators	2.5	1
000022 Loss of Rx Coolant Makeup / 2						X	2.4.21 - Knowledge of the parameters and logic used to assess the status of safety functions including: 1. Reactivity control; 2. Core cooling and heat removal; 3. Reactor coolant system integrity; 4. Containment conditions; 5. Radioactivity release control.	3.7	1
000027 Pressurizer Pressure Control System Malfunction / 3						X	2.4.18 - Knowledge of the specific bases for EOPs.	2.7	1
000029 ATWS / 1		X					EK2.06 - Breakers, relays, and disconnects	2.9*	1
000038 Steam Gen. Tube Rupture / 3			X				EK3.03 - Automatic actions associated with high radioactivity in S/G sample lines	3.6*	1
000040 Steam Line Rupture - Excessive Heat Transfer / 4					X		AA2.02 - Conditions requiring a reactor trip	4.6	1
000054 Loss of Main Feedwater / 4			X				AK3.03 - Manual control of AFW flow control valves	3.8	1
000055 Station Blackout / 6				X			EA1.06 - Restoration of power with one ED/G	4.1	1
000056 Loss of Off-site Power / 6					X		AA2.02 - ESF load sequencer status lights	3.5*	1
000058 Loss of DC Power / 6			X				AK3.01 - Use of dc control power by ED/Gs	3.4*	1
W/E04 LOCA Outside Containment / 3					X		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.6	1
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4				X			EA1.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	4.1	1
W/E11 Loss of Emergency Coolant Recirc. / 4		X					EK2.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.6	1

PWR RO Examination Outline

Printed: 09/01/2006

Facility: Salem Generating Station

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/E12 - Steam Line Rupture - Excessive Heat Transfer / 4				X			EA1.2 - Operating behavior characteristics of the facility	3.6	1
K/A Category Totals:	3	3	3	4	3	2	Group Point Total:	18	

PWR RO Examination Outline

Printed: 09/01/2006

Facility: Salem Generating Station

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
000024 Emergency Boration / 1	X						AK1.02 - Relationship between boron addition and reactor power	3.6	1
000032 Loss of Source Range NI / 7				X			AA1.01 - Manual restoration of power	3.1*	1
000033 Loss of Intermediate Range NI / 7					X		AA2.01 - Equivalency between source-range, intermediate-range, and power-range channel readings	3.0	1
000069 Loss of CTMT Integrity / 5				X			AA1.01 - Isolation valves, dampers, and electropneumatic devices	3.5	1
000076 High Reactor Coolant Activity / 9		X					AK2.01 - Process radiation monitors	2.6	1
W/E03 LOCA Cooldown - Depress. / 4	X						EK1.1 - Components, capacity, and function of emergency systems	3.4	1
W/E06 Inad. Core Cooling / 4		X					EK2.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.6	1
W/E07 Inad. Core Cooling / 4			X				EK3.3 - Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations	3.8	1
W/E13 Steam Generator Over-pressure / 4					X		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.0	1
K/A Category Totals:	2	2	1	2	2	0	Group Point Total:	9	

PWR RO Examination Outline

Printed: 09/01/2006

Facility: Salem Generating Station

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										K2.02 - CCW pumps	2.5*	1
003 Reactor Coolant Pump											X	2.4.20 - Knowledge of operational implications of EOP warnings, cautions, and notes.	3.3	1
004 Chemical and Volume Control										X		A4.05 - Letdown pressure and temperature control valves	3.6	1
005 Residual Heat Removal	X											K1.04 - CVCS	2.9	1
005 Residual Heat Removal	X											K1.12 - Safeguard pumps	3.1	1
006 Emergency Core Cooling			X									K3.03 - Containment	4.2	1
007 Pressurizer Relief/Quench Tank				X								K4.01 - Quench tank cooling	2.6	1
007 Pressurizer Relief/Quench Tank	X											K1.01 - Containment system	2.9	1
008 Component Cooling Water								X				A2.04 - PRMS alarm	3.3	1
010 Pressurizer Pressure Control						X						K6.02 - PZR	3.2	1
012 Reactor Protection					X							K5.01 - DNB	3.3*	1
012 Reactor Protection								X				A2.07 - Loss of dc control power	3.2*	1
013 Engineered Safety Features Actuation					X							K5.02 - Safety system logic and reliability	2.9	1
022 Containment Cooling				X								K4.02 - Correlation of fan speed and flowpath changes with containment pressure	3.1*	1
026 Containment Spray										X		A4.05 - Containment spray reset switches	3.5	1
039 Main and Reheat Steam										X		A4.01 - Main steam supply valves	2.9*	1
059 Main Feedwater							X					A1.03 - Power level restrictions for operation of MFW pumps and valves	2.7*	1
061 Auxiliary/Emergency Feedwater						X						K6.02 - Pumps	2.6	1
061 Auxiliary/Emergency Feedwater								X				A2.04 - pump failure or improper operation	3.4	1
062 AC Electrical Distribution							X					A1.01 - Significance of D/G load limits	3.4	1
062 AC Electrical Distribution			X									K3.01 - Major system loads	3.5	1
063 DC Electrical Distribution									X			A3.01 - Meters, annunciators, dials, recorders, and indicating lights	2.7	1
064 Emergency Diesel Generator						X						K6.07 - Air receivers	2.7	1
064 Emergency Diesel Generator											X	2.2.22 - Knowledge of limiting conditions for operations and safety limits.	3.4	1
073 Process Radiation Monitoring			X									K3.01 - Radioactive effluent	3.6	1

PWR RO Examination Outline

Printed: 09/01/2006

Facility: Salem Generating Station

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 releases	Imp.	Points
076 Service Water									X			A3.02 - Emergency heat loads	3.7	1
078 Instrument Air				X								K4.01 - Manual/automatic transfers of control	2.7	1
103 Containment											X	2.2.28 - Knowledge of new and spent fuel movement procedures.	2.6	1
K/A Category Totals:	3	1	3	3	2	3	2	3	2	3	3	Group Point Total: 28		

PWR RO Examination Outline

Printed: 09/01/2006

Facility: Salem Generating Station

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
002 Reactor Coolant				X								K4.07 - Contraction and expansion during heatup and cooldown	3.1	1
011 Pressurizer Level Control		X										K2.02 - PZR heaters	3.1	1
015 Nuclear Instrumentation					X							K5.11 - Axial flux imbalance, including long-range effects	3.3	1
016 Non-nuclear Instrumentation									X			A3.02 - Relationship between meter readings and actual parameter value	2.9*	1
028 Hydrogen Recombiner and Purge Control								X				A2.03 - The hydrogen air concentration in excess of limit flame propagation or detonation with resulting equipment damage in containment	3.4	1
029 Containment Purge							X					A1.02 - Radiation levels	3.4	1
033 Spent Fuel Pool Cooling	X											K1.02 - RHRS	2.5	1
068 Liquid Radwaste								X				A2.02 - Lack of tank recirculation prior to release	2.7*	1
072 Area Radiation Monitoring										X		A4.01 - Alarm and interlock setpoint checks and adjustments	3.0*	1
075 Circulating Water								X				A2.02 - Loss of circulating water pumps	2.5	1
K/A Category Totals:	1	1	0	1	1	0	1	3	1	1	0	Group Point Total: 10		

Generic Knowledge and Abilities Outline (Tier 3)

PWR RO Examination Outline

Printed: 09/01/2006

Facility: Salem Generating Station

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.	3.7	1
	2.1.11	Knowledge of less than one hour technical specification action statements for systems.	3.0	1
	Category Total:			2
Equipment Control	2.2.4	(multi-unit) Ability to explain the variations in control board layouts, systems, instrumentation and procedural actions between units at a facility.	2.8	1
	2.2.26	Knowledge of refueling administrative requirements.	2.5	1
	Category Total:			2
Radiation Control	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5	1
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	2.9	1
	2.3.11	Ability to control radiation releases.	2.7	1
	Category Total:			3
Emergency Procedures/Plan	2.4.27	Knowledge of fire in the plant procedure.	3.0	1
	2.4.46	Ability to verify that the alarms are consistent with the plant conditions.	3.5	1
	2.4.48	Ability to interpret control room indications to verify the status and operation of system, and understand how operator actions and directives affect plant and system conditions.	3.5	1
	Category Total:			3

Generic Total: 10

Facility: Salem Generating Station

Printed: 09/01/2006

Date Of Exam: 12/11/2020

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	5		2	7
	2	0	0	0				0	0				0	0	5		0	5
	Tier Totals	0	0	0				0	0				0	0	0	10		2
2. Plant Systems	1	0	0	0	0	0	0	0	0	0	0	0	0	3		1	4	
	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	
	Tier Totals	0	0	0	0	0	0	0	0	0	0	0	0	5		1	6	
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 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 that are not included on the outline should be added. Refer to ES-401, Attachment 2, 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.
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: 09/01/2006

Facility: Salem Generating Station

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
000011 Large Break LOCA / 3					X		EA2.08 - Conditions necessary for recovery when accident reaches stable phase	3.9*	1
000022 Loss of Rx Coolant Makeup / 2					X		AA2.02 - Charging pump problems	3.7	1
000025 Loss of RHR System / 4						X	2.4.16 - Knowledge of EOP implementation hierarchy and coordination with other support procedures.	4.0	1
000038 Steam Gen. Tube Rupture / 3						X	2.3.4 - Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	3.1	1
000040 Steam Line Rupture - Excessive Heat Transfer / 4					X		AA2.04 - Conditions requiring ESFAS initiation	4.7	1
000056 Loss of Off-site Power / 6					X		AA2.01 - PORV controller indicator and setpoint	3.4	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	5	2	Group Point Total:		7

PWR SRO Examination Outline

Printed: 09/01/2006

Facility: Salem Generating Station

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
000024 Emergency Boration / 1					X		AA2.05 - Amount of boron to add to achieve required SDM	3.9	1
W/E07 Inad. Core Cooling / 4					X		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.9	1
W/E08 RCS Overcooling - PTS / 4					X		EA2.1 - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	4.2	1
W/E09 Natural Circ. / 4					X		EA2.1 - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	3.8	1
W/E16 High Containment Radiation / 9					X		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.3	1
K/A Category Totals:	0	0	0	0	5	0	Group Point Total:	5	

PWR SRO Examination Outline

Printed: 09/01/2006

Facility: Salem Generating Station

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
005 Residual Heat Removal								X				A2.04 - RHR valve malfunction	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	3.5	1
012 Reactor Protection											X	2.2.26 - Knowledge of refueling administrative requirements.	3.7	1
059 Main Feedwater								X				A2.12 - Failure of feedwater regulating valves	3.4*	1
K/A Category Totals:	0	0	0	0	0	0	0	3	0	0	1	Group Point Total:	4	

PWR SRO Examination Outline

Printed: 09/01/2006

Facility: Salem Generating Station

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
033 Spent Fuel Pool Cooling								X				A2.03 - Abnormal spent fuel pool water level or loss of water level	3.5	1
035 Steam Generator								X				A2.01 - Faulted or ruptured S/Gs	4.6	1
K/A Category Totals:	0	0	0	0	0	0	0	2	0	0	0	Group Point Total:	2	

Generic Knowledge and Abilities Outline (Tier 3)

PWR SRO Examination Outline

Printed: 09/01/2006

Facility: Salem Generating Station

Form ES-401-3

<u>Generic Category</u>	<u>KA</u>	<u>KA Topic</u>	<u>Imp.</u>	<u>Points</u>
Conduct of Operations	2.1.6	Ability to supervise and assume a management role during plant transients and upset conditions.	4.3	1
	2.1.7	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.4	1
	Category Total:			2
Equipment Control	2.2.20	Knowledge of the process for managing troubleshooting activities.	3.3	1
	2.2.22	Knowledge of limiting conditions for operations and safety limits.	4.1	1
	Category Total:			2
Radiation Control	2.3.6	Knowledge of the requirements for reviewing and approving release permits.	3.1	1
	Category Total:			1
Emergency Procedures/Plan	2.4.10	Knowledge of annunciator response procedures.	3.1	1
	2.4.26	Knowledge of facility protection requirements including fire brigade and portable fire fighting equipment usage.	3.3	1
	Category Total:			2
Generic Total:				7

[illegible]

Facility: **SALEM**Date of Examination: **12/11/2006**Examination Level: ☐ RO ☒ SROOperating Test Number: **INDIA ILT NRC**

Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R,M	Review a completed surveillance to calculate the Quadrant Power Tilt Ratio. (2.1.7 SRO-4.4)
Conduct of Operations	R,D	Enter a Tech Spec Action Statement for an inoperable component and make a Log entry IAW SHOP-108. (K/A 004 2.1.12 SRO-4.0)
Equipment Control	R, M	2.2.13 (3.8) – Knowledge of tagging and clearance procedures Evaluate a tagging request.
Radiation Control	R,D	2.3.2 (2.9) – Knowledge of facility ALARA program QUESTION: Evaluate an airborne and whole-body exposure scenario and apply station ALARA principles regarding use of a respirator. 2.3.4 (3.1) – Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized QUESTION: Given an exposure history and an emergency situation, determine stay time.
Emergency Plan	S,N	Classify Emergency / Non-Emergency Events. (K/A 2.4.29 SRO-4.0)

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: **12/11/2006**Exam Level : RO ☐ SRO-I ☒ SRO-U ☐Operating Test No.: **"I" ILT 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. Perform actions for two stuck out rods post trip IAW EOP-TRIP-2	A,C,D,L,S	1
b. Swap ECCS from Injection Mode to Cold Leg Recirc MODE IAW EOP-LOCA-3.	C,D,L,P,S,	2
c. Respond to Pressurizer PORV failure failure.	A,C,L,N,S	3
d. Perform RCS leak rate calculation	C,N,S	4(Pri)
e. Terminate Containment Spray in EOP-LOCA-5	C,D,L,S	5
f. Adjust PR NI following calorimetric.	N,C,S	7
g. Perform CCW pump restoration IAW APPX-1	A,C,D,S,L,P	8
h. Not Applicable	--	--

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

i. TCAF Control Room Evacuation-Feed SG's using 21/22 AFW Pump.	D,E,L,R,P	4(sec)
j. TCAF Control Room Evacuation (Trip Turbine, Open Exciter Field Breaker, Trip SGFP's)	D,E,	6
k. Perform an Authorized Waste Gas Release	A,R	9

*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
(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 & 2Scenario No.: NRC #1Op-Test No.: India

Examiners: _____

Operators: _____

Initial Conditions: 100% Rated Thermal Power

Turnover: Unit at 100% power. 22 Heater Drain Pump has a Mech Seal leak and needs to be removed from service. 2B EDG is tagged for repair of governor linkage. All required surveillances are complete. Weather conditions are normal. Unit 1 and Hope Creek are at 100% power. Shift orders are to reduce power to 90% at 30% per hour to remove 22 Heater Drain pump from service.

Event No.	Malf. No.	Event Type*	Event Description
1	-----	N/R CRS/PO RO	Reduce Power to 90% To Repair Seal Leak on 22 HTR Drain Pump
2	PR0016A	I CRS/RO	CH 1 Pzr Press fails HI (TS-CRS)
3	SW0216A	C CRS/PO	Leak in SW Bay #2 (TS-CRS)
4	SG0078A	C CRS/RO	Steam Gen Tube Leak on 21 SG (TS-CRS)
5	SG0078A EL0134	M ALL	21 SGTL progresses to Steam Generator Tube Rupture, with Loss of Off-Site Power (B bus de-energized)
6	VL0055	C CRS/RO	23SW20 fails to close on SEC
7	OR: AI06, GAI06AFK	I CRS/RO	BIT Injection Meter Fails to 0 Flow

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

Facility: SALEM 1 & 2Scenario No.: NRC #2Op-Test No.: India

Examiners: _____

Operators: _____

Initial Conditions: 4% Rated Thermal Power

Turnover: Unit at 4% power returning from a forced outage due to DEHC problems. All approvals and surveillances are complete and approval to proceed to mode 1 has been given. Orders to the shift is to raise power in preparation for placing turbine on line

Event No.	Malf. No.	Event Type*	Event Description
1	_____	N/R CRS/PO/RO	Raise power to 18% to place turbine on line
2	REM: MC12D	TS CRS	Loss of Tripping Capability B Rx Trip Breaker (TS CRS)
3	CV0034 VL0245	C/C CRS/RO	23 charging pump trips and Letdown valve fails to close (TS CRS)
4	EL0102	C CRS/RO/PO	Failure of 3Station Power Transformer (TS CRS)
5	RC0002	M ALL	Small Break LOCA
6	RP0108	C CRS/RO	Auto SI fails to actuate
7	EL0134	C CRS/RO/PO	Loss of Off-Site Power ECCS restoration

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

Facility: SALEM 1 & 2Scenario No.: NRC #3Op-Test No.: India

Examiners: _____

Operators: _____

Initial Conditions: 100% Rated Thermal Power BOL

Turnover: Unit at 100% power, 21 AFW pump is tagged for emergent work to inboard bearing, Solar Magnetic Disturbances have been occurring currently at K-3, river grass loading very heavy at last tide change, high tide in 2 hours.

Event No.	Malf. No.	Event Type*	Event Description
1	EL12A	N/R CRS/PO/RO	Power Red to 80% due to Grid Disturbance(SMD)
2	RC0014B	I/R CRS/RO	22 Loop Thot fails during downpower (TS CRS)
3	CC0329	C CRS/PO	CCW leak on 21 CCW header (TS CRS)
4	AN0529	C CRS/RO	Major Oil Leak at MPT
5	RP0069 RP0073 RP0279A RP0279B	C ALL	Main Turbine fails to Trip/Manual MSLI required
6	AF0183 AF0181B	M/C All	Loss of Heat Sink, 23 AFW pp trips 22 AFW pump trips after AFW throttled, CN pump recovery

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

Facility: SALEM 1 & 2Scenario No.: NRC #4Op-Test No.: India

Examiners: _____

Operators: _____

Initial Conditions: 100% Rated Thermal Power, MOL

Turnover: Unit at 100% power. 2B DG is C/T for repairs to the overspeed trip mechanism. 2PR1 is leaking and its block valve is closed. A Winter Storm Alert has been issued for the area and will be in effect until 6:00 AM tomorrow. Solar Magnetic Disturbances have been occurring, current SMD K-3. Orders to shift are to maintain current power level

Event No.	Malf. No.	Event Type*	Event Description
1	NI0193	I CRS/RO	2N44 Fails Hi (TS CRS)
2	SW0222C SW0339E	C/I CRS/PO	23 SW strainer clogs/25 SW pump fails to Auto Start (TS CRS)
3	Tu0081H	C/R/N CRS/RO/PO	Turbine Gov Vlv Fails closed
4	RD0061	C CRS/RO	Rod Speed Fails to 32 SPM
5	AN0137 VL0049, 50,51, 52,56,87	C CRS/RO	Inadvertent PH B (Loss of CCW to RCPs)
6	EL0134 RP318Q1 EL0273A EL0146	M All	Loss of All AC Power
7	AF0183	C CRS/PO	Trip of 23 AFW pump

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