Facility: SSES Date of Exam: 08/12/02 Exam Level: SRO

Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	4	4	5				4	5			4	26
	2	3	3	2				3	4			2	17
	Tier Totals	7	7	7				7	9			6	43
2. Plant Systems	1	2	1	3	2	2	2	2	2	2	1	4	23
	2	1	1	1	1	1	2	1	1	1	1	2	13
	3	0	0	1	0	1	0	0	1	0	0	1	4
	Tier Totals	3	2	5	3	4	4	3	4	3	2	7	40

3. Generic Knowledge and Abilities	Cat 1	Cat 2	Cat 3	Cat 4	17
	4	4	4	5	

Note:
1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., 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 exam must total 100 points.
3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category/tier.
6.* The generic 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.
7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the SRO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.

ES-401 BWR SRO Examination OutlineForm ES-401-1 (R8, S1)

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
295003 Partial or Complete Loss of AC Pwr / 6		X				X	AK2.01 Station batteries 2.1.33 Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications [SRO14]	3.3 4.0	2
295006 SCRAM / 1	X			X			AK1.03 Reactivity control AA1.04 Recirculation system	4.0 3.2	2
295007 High Reactor Pressure / 3		X	X				AK2.02 Reactor power AK3.06 Reactor/turbine pressure regulating system operation	3.8 3.8	2
295009 Low Reactor Water Level / 2					X		AA2.03 Reactor water cleanup blowdown rate [SRO15]	2.9	1
295010 High Drywell Pressure / 5		X		X			AK2.01 Suppression pool level AA1.02 Drywell floor and equipment drain sumps	3.3 3.6	2
295013 High Suppression Pool Temp. / 5					X	X	AA2.02 Localized heating/stratification [SRO09] 2.4.31 Knowledge of annunciators alarms and indications, and use of the response instructions	3.5 3.4	2
295014 Inadvertent Reactivity Addition / 1			X				AK3.02 Control rod blocks	3.7	1
295015 Incomplete SCRAM / 1									
295016 Control Room Abandonment / 7					X	X	AA2.04 Suppression pool temperature 2.1.14 Knowledge of system status criteria which require the notification of plant personnel [SRO05]	4.1 3.3	2
295017 High Off-site Release Rate / 9	X					X	AK1.02 Protection of the general public 2.4.30 Knowledge of which events related to system operations/status should be reported to outside agencies [SRO19]	4.3 3.6	2
295023 Refueling Accidents Cooling Mode / 8									
295024 High Drywell Pressure / 5	X		X				EK1.01 Drywell integrity: Plant-Specific EK3.09 Auxiliary building isolation: Plant-Specific	4.2 3.6	2
295025 High Reactor Pressure / 3									
295026 Suppression Pool High Water Temp. / 5			X		X		EK3.03 Suppression pool spray: Plant-Specific EA2.02 Suppression pool level	3.8 3.9	2
295030 Low Suppression Pool Water Level / 5				X			EA1.02 RCIC: Plant-Specific	3.5	1
295031 Reactor Low Water Level / 2	X				X		EK1.01 Adequate core cooling EA2.02 Reactor power [SRO08]	4.7 4.2	2
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1									
295038 High Off-site Release Rate / 9			X				EK3.02 System isolations	4.2	1
500000 High Containment Hydrogen Conc. / 5		X		X			EK2.06 Wetwell spray system EA1.01 Primary containment hydrogen instrumentation	3.4 3.3	2
K/A Category Totals:	4	4	5	4	5	4	Group Point Total:		26

ES-401 BWR SRO Examination OutlineForm ES-401-1 (R8, S1)

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4			X				AK3.02 Reactor power response	3.8	1
295002 Loss of Main Condenser Vacuum / 3									
295004 Partial or Total Loss of DC Pwr / 6	X						AK1.05 Loss of breaker protection	3.4	1
295005 Main Turbine Generator Trip / 3				X			AA1.01 Recirculation system: Plant-Specific	3.3	1
295008 High Reactor Water Level / 2									
295012 High Drywell Temperature / 5					X		AA2.01 Drywell temperature [SRO21]	3.9	1
295018 Partial or Total Loss of CCW / 8		X	X				AK2.01 System loads AK3.06 Increasing cooling water flow to heat exchangers	3.4 3.3	2
295019 Partial or Total Loss of Inst. Air / 8				X		X	AA1.02 Instrument air system valves: Plant-Specific 2.4.6 Knowledge of symptom based EOP mitigation strategies [SRO22]	3.1 4.0	2
295020 Inadvertent Cont. Isolation / 5 & 7	X	X					AK1.04 Bottom head thermal stratification AK2.06 HPCI: Plant-Specific	2.8 3.8	2
295021 Loss of Shutdown Cooling / 4									
295022 Loss of CRD Pumps / 1									
295028 High Drywell Temperature / 5		X					EK2.02 Components internal to the drywell	3.3	1
295029 High Suppression Pool Water Level / 5						X	2.2.25 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits [SRO12]	3.7	1
295032 High Secondary Containment Area Temperature / 5									
295033 High Secondary Containment Area Radiation Levels / 9					X		EA2.02 Equipment operability [SRO02]	3.2	1
295034 Secondary Containment Ventilation High Radiation / 9					X		EA2.02 Cause of high radiation levels [SRO17]	4.2	1
295035 Secondary Containment High Differential Pressure / 5	X			X			EK1.01 Secondary containment integrity EA1.02 SBGT/FRVS	4.2 3.8	2
295036 Secondary Containment High Sump/Area Water Level / 5					X		EA2.01 Operability of components in the area [SRO16]	3.2	1
600000 Plant Fire On Site / 8									
K/A Category Point Totals:	3	3	2	3	4	2	Group Point Total:		17

ES-401BWR SRO Examination OutlineForm ES-401-1 (R8, S1)

Plant Systems - Tier 2/Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Points
202002 Recirculation Flow Control									X			A3.03 Scoop tube operation	3.0	1
203000 RHR/LPCI: Injection Mode						X	X					K6.06 Suppression pool A1.09 Component cooling water system	3.9 2.9	2
206000 HPCI									X			A3.01 Turbine speed	3.5	1
209001 LPCS														
211000 SLC														
212000 RPS														
215004 Source Range Monitor														
215005 APRM / LPRM														
216000 Nuclear Boiler Instrumentation					X							K5.10 Indicated level versus actual during vessel heatups and cooldowns	3.3	1
217000 RCIC											X	2.1.32 Ability to explain and apply system limits and precautions	3.8	1
218000 ADS			X								X	K3.02 Ability to rapidly depressurize the reactor 2.1.33 Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications [SRO13]	4.6 4.0	2
223001 Primary CTMT and Auxiliaries		X		X								K2.09 Drywell cooling fans K4.03 Containment/drywell isolation	2.9 3.8	2
223002 PCIS/Nuclear Steam Supply Shutoff			X	X								K3.14 Recirculation system: Plant-Specific K4.03 Manual initiation capability: Plant-Specific	3.0 3.6	2
226001 RHR/LPCI: CTMT Spray Mode										X		A4.09 Pump discharge pressure	2.7	1
239002 SRVs								X				A2.02 Leaky SRV	3.2	1
241000 Reactor/Turbine Pressure Regulator					X						X	K5.03 Reactor power vs. reactor pressure 2.2.25 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits [SRO25]	3.6 3.7	2
259002 Reactor Water Level Control							X					A1.02 Reactor feedwater flow	3.5	1
261000 SGTS								X				A2.13 High secondary containment exhaust radiation	3.7	1
262001 AC Electrical Distribution	X		X									K1.01 Emergency generators K3.02 Emergency generators	4.3 4.2	2
264000 EDGs											X	2.1.14 Knowledge of system status criteria which requires the notification of plant personnel [SRO24]	3.3	1
290001 Secondary CTMT	X					X						K1.07 Turbine building ventilation (steam tunnel): Plant-Specific	3.1	2

												K6.01 Reactor building ventilation: Plant-Specific	3.6	
K/A Category Point Totals:	2	1	3	2	2	2	2	2	2	1	4	Group Point Total:		23

ES-401BWR SRO Examination OutlineForm ES-401-1 (R8, S1)

Plant Systems - Tier 2/Group 2

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Points
201001 CRD Hydraulic														
201002 RMCS														
201004 RSCS						X						K6.02 Rod direction information	3.2	1
201006 RWM														
202001 Recirculation									X			A3.07 Pump trips: Plant-Specific	3.3	1
204000 RWCU														
205000 Shutdown Cooling														
214000 RPIS														
215002 RBM			X									K3.01 Reactor manual control system	3.5	1
215003 IRM														
219000 RHR/LPCI: Torus/Pool Cooling Mode														
230000 RHR/LPCI: Torus/Pool Spray Mode				X								K4.07 Prevention of water hammer	3.2	1
234000 Fuel Handling Equipment							X					A1.03 Core reactivity level	3.9	1
245000 Main Turbine Gen. and Auxiliaries						X						K6.01 Gland seal	2.9	1
259001 Reactor Feedwater														
262002 UPS (AC/DC)										X		A4.01 Transfer from alternate source to preferred source	3.1	1
263000 DC Electrical Distribution								X				A2.01 Grounds	3.2	1
271000 Offgas	X										X	K1.01 condenser air removal 2.4.6 Knowledge symptom based EOP mitigation strategies [SRO23]	3.1 4.0	2
272000 Radiation Monitoring											X	2.4.30 Knowledge of which events related to system operations/status should be reported to outside agencies [SRO18]	3.6	1
286000 Fire Protection														
290003 Control Room HVAC					X							K5.01 Airborne contamination (eg. Radiological, toxic gas, smoke) control	3.5	1
300000 Instrument Air														
400000 Component Cooling Water		X										K2.02 CCW valves	2.9	1
K/A Category Point Totals:	1	1	1	1	1	2	1	1	1	1	2	Group Point Total:		13

ES-401BWR SRO Examination OutlineForm ES-401-1 (R8, S1)

Plant Systems - Tier 2/Group 3

System # / Name	K 1	K 2	K 3	K 4	K 5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
201003 Control Rod and Drive Mechanism														
215001 Traversing In-core Probe											X	2.4.49 Ability to perform without reference to procedure those actions that require immediate operation of system components and controls [SRO10]	4.0	1
233000 Fuel Pool Cooling and Cleanup			X									K3.05 Fuel pool water fission product concentration	2.8	1
239001 Main and Reheat Steam														
256000 Reactor Condensate					X			X				K5.03 Heat exchanger level operation A2.09 Low feedwater heater level	2.7 2.8	2
268000 Radwaste														
288000 Plant Ventilation														
290002 Reactor Vessel Internals														
K/A Category Point Totals:												Group Point Total:		4

Plant-Specific Priorities

System / Topic	Recommended Replacement for...	Reason	Points
217000 Reactor Core Isolation Cooling System-A2.04 AC power loss		SBO high on PRA for SSES	1

Plant-Specific Priority Total (limit 10): 1

Facility: SSES	Date of Exam: 08/12/02		Exam Level: SRO	
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.11	Knowledge of less than one hour technical specification action statements for systems [SRO04]	3.8	1
	2.1.13	Knowledge of facility requirements for controlling vital/controlled access [SRO11]	2.9	1
	2.1.28	Knowledge of the purpose and function of major system components and controls	3.3	1
	2.1.23	Ability to perform specific system and integrated plant procedures during different modes of plant operation	4.0	1
	Total			4
Equipment Control	2.2.3	(multi-unit) Knowledge of the design/procedural/and operational; differences between units [SRO03]	3.3	1
	2.2.19	Knowledge of maintenance work order requirements [SRO07]	3.1	1
	2.2.24	Ability to analyze the affect of maintenance on LCO status	3.8	1
	2.2.30	Knowledge of RO duties in the control room during fuel handling such as alarms from fuel handling area/communication with fuel storage facility/systems operated from the control room in support of fueling operations/and supporting instrumentation	3.3	1
	Total			4
Radiation Control	2.3.3	Knowledge of SRO responsibilities for auxiliary systems that are outside the control room (eg. Waste disposal and handling systems) [SRO20]	2.9	1
	2.3.1	Knowledge of 10CFR: 20 and related facility radiation control requirements [SRO06]	3.0	1
	2.3.11	Ability to control radiation releases	3.2	1
	2.3.9	Knowledge of the process for performing a containment purge	3.4	1
	Total			4

Emergency Procedures/ Plan	2.4.1	Knowledge of EOP entry conditions and immediate action steps [SRO01]	4.6	1
	2.4.16	Knowledge of EOP implementation hierarchy and coordination with other support procedures	4.0	1
	2.4.21	Knowledge of the parameters and logic used to assess the status of safety functions including:	4.3	1
	2.4.47	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material	3.7	1
	2.4.27	Knowledge of fire in the plant procedures	3.5	1
	Total			5
Tier 3 Point Total (RO/SRO)				13/17

Facility: SSES		Date of Exam: 08/12/02						Exam Level: RO					
Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	3	3	3				4	0			0	13
	2	3	4	4				3	3			2	19
	3	1	0	0				1	1			1	4
	Tier Totals	7	7	7				8	4			3	36
2. Plant Systems	1	2	2	3	2	3	2	3	3	2	3	3	28
	2	3	2	2	2	2	3	0	2	1	2	0	19
	3	0	0	1	1	0	0	1	0	1	0	0	4
	Tier Totals	5	4	6	5	5	5	4	5	4	5	3	51
3. Generic Knowledge and Abilities		Cat 1			Cat 2			Cat 3			Cat 4		13
		3			3			3			4		

Note:
1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., 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 exam must total 100 points.
3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category/tier.
6.* The generic 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.
7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the SRO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.

ES-401 BWR RO Examination OutlineForm ES-401-2 (R8, S1)
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
295005 Main Turbine Generator Trip / 3				X			AA1.01 Recirculation system: Plant-Specific [BOTH 6]	3.1	1
295006 SCRAM / 1	X			X			AK1.03 Reactivity control [BOTH 8] AA1.04 Recirculation system [BOTH 7]	3.7 3.1	2
295007 High Reactor Pressure / 3		X	X				AK2.02 Reactor power [BOTH 10] AK3.06 Reactor/turbine pressure regulating system operation [BOTH 9]	3.8 3.7	2
295009 Low Reactor Water Level / 2									
295010 High Drywell Pressure / 5		X		X			AK2.01 Suppression pool level [BOTH 12] AA1.02 Drywell floor and equipment drain sumps [BOTH 11]	3.2 3.6	2
295014 Inadvertent Reactivity Addition / 1			X				AK3.02 Control rod blocks [BOTH 38]	3.7	1
295015 Incomplete SCRAM / 1									
295024 High Drywell Pressure / 5	X		X				EK1.01 Drywell integrity: Plant-Specific [BOTH 37] EK3.09 Auxilary Building isolation: Plant-Specific [BOTH 46]	4.1 3.1	2
295025 High Reactor Pressure / 3									
295031 Reactor Low Water Level / 2	X						EK1.01 Adequate core cooling [BOTH 01]	4.6	1
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1									
500000 High Containment Hydrogen Conc. / 5		X		X			EK2.06 Wetwell spray system [BOTH 72] EA1.01 Primary containment hydrogen instrumentation [BOTH 53]	3.0 3.4	2
K/A Category Totals:	3	3	3	4	0	0	Group Point Total:		13

ES-401 BWR RO Examination OutlineForm ES-401-2 (R8, S1)

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4			X				AK3.02 Reactor power response [BOTH 33]	3.7	1
295002 Loss of Main Condenser Vacuum / 3									
295003 Partial or Complete Loss of AC Pwr / 6		X					AK2.01 Station batteries [BOTH 48]	3.2	1
295004 Partial or Complete Loss of DC Pwr / 6	X						AK1.05 Loss of breaker protection [BOTH 14]	3.3	1
295008 High Reactor Water Level / 2									
295012 High Drywell Temperature / 5									
295013 High Suppression Pool Temp. / 5						X	2.4.31 Knowledge of annunciators alarms and indications, and use of the response instructions [BOTH 32]	3.3	1
295016 Control Room Abandonment / 7					X	X	AA2.04 Suppression pool temperature [BOTH 54] 2.4.6 Knowledge symptom based EOP mitigation strategies [RO14]	3.9 3.1	2
295017 High Off-site Release Rate / 9	X			X			AK1.02 Protection of the general public [BOTH 16] AA1.10 RPS [RO03]	3.8 3.6	2
295018 Partial or Complete Loss of CCW / 8		X	X				AK2.01 System loads [BOTH 17] AK3.06 Increasing cooling water flow to heat exchangers [BOTH 73]	3.3 3.3	2
295019 Part. or Comp. Loss of Inst. Air / 8				X			AA1.02 Instrument air system valves: Plant-Specific [BOTH 47]	3.3	1
295020 Inadvertent Cont. Isolation / 5 & 7	X	X					AK1.04 Bottom head thermal stratification [BOTH 71] AK2.06 HPCI: Plant-Specific [BOTH 70]	2.5 3.8	2
295022 Loss of CRD Pumps / 1									
295026 High Suppression Pool Water Temp. / 5			X		X		EK3.03 Suppression pool spray: Plant-Specific [BOTH 49] EA2.02 Suppression pool level [BOTH 13]	3.5 3.8	2
295028 High Drywell Temperature / 5		X			X		EK2.02 Components internal to the drywell [BOTH 51] EA2.05 Torus/suppression chamber pressure: Plant-Specific [RO22]	3.2 3.6	2
295029 High Suppression Pool Water Level / 5									
295030 Low Suppression Pool Water Level / 5				X			EA1.02 RCIC: Plant-Specific [BOTH 50]	3.4	1
295033 High Sec. Cont. Area Rad. Levels / 9									
295034 Sec. Cont. Ventilation High Rad. / 9									
295038 High Off-site Release Rate / 9			X				EK3.02 System isolations [BOTH 36]	3.9	1
600000 Plant Fire On Site / 8									
K/A Category Point Totals:	3	4	4	3	3	2	Group Point Total:		19

ES-401 BWR RO Examination OutlineForm ES-401-2 (R8, S1)

Emergency and Abnormal Plant Evolutions - Tier 1/Group 3

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
295021 Loss of Shutdown Cooling / 4						X	2.1.32 Ability to explain and apply system limits and precautions [RO04]	3.1	1
295023 Refueling Accidents / 8					X		AA2.01 Area radiation levels [RO15]	3.6	1
295032 High Secondary Containment Area Temperature / 5									
295035 Secondary Containment High Differential Pressure / 5	X			X			EK1.01 Secondary containment integrity [BOTH 55] EA1.02 SBGT/FRVS [BOTH 56]	3.9 3.6	2
295036 Secondary Containment High Sump/Area Water Level / 5									
K/A Category Point Totals:	1	0	0	1	1	1	Group Point Total:		4

ES-401 BWR RO Examination OutlineForm ES-401-2 (R8, S1)

Plant Systems - Tier 2/Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Points
201001 CRD Hydraulic														
201002 RMCS										X		A4.05 Rod select matrix [RO05]	3.1	1
202002 Recirculation Flow Control									X			A3.03 Scoop tube operation [BOTH 18]	3.1	1
203000 RHR/LPCI: Injection Mode						X	X					K6.06 Suppression pool [BOTH 58] A1.09 Component cooling water system [BOTH 65]	3.8 2.9	2
206000 HPCI		X							X			K2.01 System valves [RO25] A3.01 Turbine speed [BOTH 64]	3.2 3.6	2
209001 LPCS	X									X		K1.14 Reactor vessel [RO16] A4.05 Manual initiation controls [RO17]	3.7 3.8	2
211000 SLC											X	2.1.33 Ability to recognize indications and system operating parameters which are entry-level conditions for technical specifications [RO02]	3.4	1
212000 RPS											X	2.4.4 Ability to recognize abnormal for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures [RO18]	4.0	1
215003 IRM										X		A4.04 IRM back panel switches, meters and indicating lights [RO06]	3.1	1
215004 SRM														
215005 APRM / LPRM								X				A2.03 Inoperative trip (all causes) [RO07]	3.6	1
216000 Nuclear Boiler Instrumentation					X							K5.10 Indicated level versus actual during vessel heatups or cooldowns [BOTH 19]	3.1	1
217000 RCIC			X								X	2.1.32 Ability to explain and apply system limits and precautions [BOTH 20] K3.03 Decay heat removal [RO20]	3.4 3.5	2
218000 ADS			X				X					K3.02 Ability to rapidly depressurize the reactor [BOTH 35] A1.04 Reactor pressure [RO13]	4.5 4.1	2
223001 Primary CTMT and Auxiliaries		X		X								K2.09 Drywell cooling fans: Plant-Specific [BOTH 21] K4.03 Containment/drywell isolation [BOTH 22]	2.7 3.7	2
223002 PCIS/Nuclear Steam Supply Shutoff			X	X								K3.14 Recirculation system: Plant-Specific [BOTH 57] K4.03 Manual initiation capability: Plant-Specific [BOTH 24]	3.0 3.5	2
239002 SRVs	X							X				K1.06 Drywell instrument air/drywell pneumatics: Plant-Specific [RO19] A2.02 Leaky SRV [BOTH 2]	3.4 3.1	2
241000 Reactor/Turbine Pressure Regulator					X	X						K5.03 Reactor power vs. reactor pressure [BOTH 61]	3.5 2.6	2

												K6.02 DC electrical power [RO21]		
259001 Reactor Feedwater														
259002 Reactor Water Level Control					X		X					K5.03 Water level measurement [RO10] A1.02 Reactor feedwater flow [BOTH 34]	3.1 3.6	2
261000 SGTS								X				A2.13 High secondary exhaust radiation [BOTH 63]	3.4	1
264000 EDGs														
K/A Category Point Totals:	2	2	3	2	3	2	3	3	2	3	3	Group Point Total:		28

ES-401 BWR RO Examination OutlineForm ES-401-2 (R8, S1)

Plant Systems - Tier 2/Group 2

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Points
201003 Control Rod and Drive Mechanism														
201004 RSCS						X						K6.02 Rod direction information [BOTH 68]	3.1	1
201006 RWM														
202001 Recirculation									X			A3.07 Pump trips: Plant-Specific [BOTH 4]	3.3	1
204000 RWCU														
205000 Shutdown Cooling														
214000 RPIS														
215002 RBM			X									K3.01 Reactor manual control system [BOTH 59]	3.3	1
219000 RHR/LPCI: Torus/Pool Cooling Mode														
226001 RHR/LPCI: CTMT Spray Mode										X		A4.09 Pump discharge pressure [BOTH 3]	2.8	1
230000 RHR/LPCI: Torus/Pool Spray Mode		X		X								K2.02 Pumps [RO09] K4.07 Prevention of water hammer [BOTH 66]	2.8 3.1	2
239001 Main and Reheat Steam														
245000 Main Turbine Gen. and Auxiliaries						X						K6.01 Gland seal [BOTH 74]	2.8	1
256000 Reactor Condensate					X			X				K5.03 Heat exchanger level operation [BOTH 41] A2.09 Low feedwater heater level [BOTH 60]	2.6 2.8	2
262001 AC Electrical Distribution	X		X									K1.01 Emergency generators [BOTH 62] K3.02 Emergency generators [BOTH 5]	3.8 3.8	2
262002 UPS (AC/DC)										X		A4.01 Transfer from alternate source to preferred source [BOTH 67]	2.8	1
263000 DC Electrical Distribution								X				A2.01 Grounds [BOTH 25]	2.8	1
271000 Offgas	X											K1.01 condenser air removal system [BOTH 26]	3.1	1
272000 Radiation Monitoring														
286000 Fire Protection														
290001 Secondary CTMT	X					X						K1.07 Turbine building ventilation (steam tunnel): Plant-Specific [BOTH 75] K6.01 Reactor building ventilation: Plant-Specific [BOTH 69]	3.0 3.5	2
290003 Control Room HVAC					X							K5.01 Airborne contamination (e.g. radiological, toxic gas, smoke) control [BOTH 44]	3.2	1
300000 Instrument Air														
400000 Component Cooling Water		X		X								K2.02 CCW valves [BOTH 45]	2.9	2

												K4.01 Automatic start of standby pump [RO11]	3.4	
K/A Category Point Totals:	3	2	2	2	2	3	0	2	1	2	0	Group Point Total:		19

ES-401 BWR RO Examination OutlineForm ES-401-2 (R8, S1)

Plant Systems - Tier 2/Group 3

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Points
215001 Traversing In-core Probe									X			A3.03 Valve operation [RO12]	2.5	1
233000 Fuel Pool Cooling and Cleanup			X									K3.05 Fuel pool water fission product concentration [BOTH 42]	2.6	1
234000 Fuel Handling Equipment							X					A1.03 Core reactivity level [BOTH 43]	3.4	1
239003 MSIV Leakage Control														
268000 Radwaste														
288000 Plant Ventilation				X								K4.03 Automatic starting and tripping of fans [RO23]	2.8	1
290002 Reactor Vessel Internals														
K/A Category Point Totals:	0	0	1	1	0	0	1	0	1	0	0	Group Point Total:		4

Plant-Specific Priorities

System / Topic	Recommended Replacement for...	Reason	Points
217000 Reactor Core Isolation Cooling System-A2.04 AC power loss		SBO high on PRA for SSES	1
Plant-Specific Priority Total: (limit 10)			1

ES-401 Generic Knowledge and Abilities Outline (Tier 3) Form ES-401-5 (R8, S1)

Facility: SSES	Date of Exam: 08/12/02		Exam Level: RO	
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.28	Knowledge of the purpose and function of major system components and controls [BOTH 23]	3.2	1
	2.1.23	Ability to perform specific system and integrated plant procedures during different modes of plant operation [BOTH 40]	3.9	1
	2.1.1	Knowledge of the conduct of operations requirements [RO24]	3.7	1
	Total			3
Equipment Control	2.2.24	Ability to analyze the affect of maintenance on LCO status [BOTH 15]	2.6	1
	2.2.30	Knowledge of RO duties in the control room during fuel handling such as alarms from fuel handling area/communication with fuel storage facility/systems operated from the control room in support of fueling operations/and supporting instrumentation [BOTH 39]	3.5	1
	2.2.22	Knowledge of limiting conditions for operations and safety limits [RO01]	3.4	1
	Total			3
Radiation Control	2.3.11	Ability to control radiation releases [BOTH 27]	2.7	1
	2.3.9	Knowledge of the process for performing a containment purge [BOTH 28]	2.5	1
	2.3.2	Knowledge of facility ALARA program [RO08]	2.5	1
	Total			3
Emergency Procedures/ Plan	2.4.16	Knowledge of EOP implementation hierarchy and coordination with other support procedures [BOTH 29]	3.0	1
	2.4.21	Knowledge of the parameters and logic used to assess the status of safety functions including: Reactivity control [BOTH 52]	3.7	1

	2.4.47	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material [BOTH 30]	3.4	1
	2.4.27	Knowledge of fire in the plant procedures [BOTH 31]	2.9	1
	Total			4
Tier 3 Point Total (RO/SRO)				13/17

SUSQUEHANNA STEAM ELECTRIC STATION

Tier / Group	Randomly Selected K/A	Reason for Rejection
Various	Line Out in Attached NUREG 1123, Rev. 2 for SSES	Lineout of all K/As not applicable to SSES design per letter PLA005439 PLI A14-13 from Jeff Helsel (PPL) to Alan Blamey (NRC) dated Feb 4th, 2002. These items were rejected because the line item does not pertain to the design of the Susquehanna Steam Electric Station. Additional justification is provided for the following specific K/A line items per A. Blamey request. 1. 201001 A4.02 SSES design has no control room indication or control, valves are manual local. 2. 201001 A4.05 SSES does not have a Cooling Water Press Control valve. 3. 201002 A3.04/A4.04 SSES does not have a timer alarm or test switch in its design. 4. 202002 K4.04 Load following circuit is disabled. 5. 211000 K6.04 and 6.05 No connection or interrelation between CS or HPCI and SLC. RCIC covered by 295037 EA1.10. 6. 206000 K5.03 SSES design uses Bailey controller, covered by K5.05 Turbine Speed Controller. 7. 209001 A4.07 SSES design uses Condensate Transfer for keep fill not a separate pump. 8. 256000 A3.09 SSES design uses cascading drain system with no drain tank level controller, drain tank flooded. 9. 217000 K1.08 SSES design uses Condensate Transfer for keep fill not a separate pump. 10. 218000 K1.05 SSES remote S/D panels do not effect ADS logic only individual valve control switches for 3 valves. 11. 241000 A3.17 SSES design does not provide for turbine runback: direct turbine trip w/o runback
Tier1 and Tier 2	Generic K/As	Non-system Generic K/As suppressed per NRC Suppression Guidance Letter, 'Clarification of Guidance Regarding the Elimination of Inappropriate Knowledge and Abilities (K/As) on Written Operator Licensing Examinations'
All	<2.5 Importance Rating	All K/A that are less than 2.5 and applicable to SSES design will not be selected for examination with exception of K/A 217000 A2.04. SSES PRA has identified SBO as a core damage event and therefore this K/A may be considered as a plant specific priority per ES-401
		Changes made after initial outline submittal during exam development
Tier 1/GP3 RO	295021 AK2.07	Random generated replacement 295021 2.1.32 due to difficulty writing >LOD1 question to original K/A
Tier 2/GP1 RO	215003 K1.05	Random generated replacement 206000 K2.01 due to original K/A not being applicable to SSES for display control
Tier2/GP3 RO	233000 K2.02	Random generated replacement 288000 K4.03due to oversampling of RHR K2 power supply K/A
Tier 3 RO	2.1.16	Random generated replacement 2.1.1 due to difficulty writing >LOD1 question to original K/A and overlap with simulator tasks

Tier 2/GP1 RO	217000 K2.04	Random generated replacement 217000 2.1.32 due to difficulty writing >LOD1 question to original K/A
Tier 2/GP1 SRO	217000 K2.04	Random generated replacement 264000 2.1.14 due to difficulty writing >LOD1 question to original K/A
Tier 2/GP2 RO	271000 K1.02	Random generated replacement 271000 K1.01 due to difficulty writing >LOD1 question to original K/A
Tier 2/GP2 SRO	271000 K1.02	Random generated replacement 271000 K1.01 due to difficulty writing >LOD1 question to original K/A
Tier 1/GP2 SRO	295021 2.1.32	Random generated replacement 295033 EA2.02 due to original K/A not appropriate for SRO only question
Tier 2/GP1 SRO	261000 2.4.49	Random generated replacement 241000 2.2.25 due to original K/A not appropriate for SRO only question
Admin Topics ES-301 (RO)	2.4.39	Replaced with 2.4.27 due to significant overlap between original and question A.4.b.RO in same topic (i.e. Emergency Plan)
JPM B.2.a	230000/295031	Replaced with 211000/295037 to increase the discrimination ability of JPM.

Facility: SSES Date of Examination: 08/12/02
Examination Level (circle one): **SRO** Operating Test Number: A-SRO

Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	CONDUCT OF OPS	Requirements to maintain a license 2.1.1 (3.8) Question – A.1.a.SRO
		Discovery of mispositioned control rod 2.1.20 (4.2) Question – A.1.b.SRO
		Action when less than required staffing at shift turnover 2.1.4 (3.4) Question – A.1.c.SRO
		Working hour restrictions 2.1.1 (3.8) Question – A.1.d.SRO
A.2	EQUIPMENT CONTROL	JPM-Review failed surveillance and determine actions 2.2.24 (3.8) SRO A2 JPM
A.3	RADIATION CONTROL	Authorizing exceeding station/NRC limits 2.3.4 (3.1) Question – A.3.a.SRO
		Control of Locked High Radiation Areas 2.3.10 (3.3) Question – A.3.b.SRO
A.4	EMERGENCY PLAN	JPM Fill out classification paperwork SRO A4 JPM

Facility: SSES Date of Examination: 08/12/02
Examination Level (circle one): **RO** Operating Test Number: A-RO

Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	CONDUCT OF OPS	Requirements to maintain a license 2.1.1 (3.7) Question – A.1.a.RO
		Discovery of mispositioned control rod 2.1.20 (4.3) Question – A.1.b.RO
		Requirements for temporary relief 2.1.3 (3.0) Question – A.1.c.RO
		Requirements for temp mod of procedure 2.1.21 (3.1) Question – A.1.d.RO
A.2	EQUIPMENT CONTROL	JPM-Review failed surveillance and determine actions 2.2.24 (2.6) RO A2 JPM
A.3	RADIATION CONTROL	Stay time limits 2.3.1 (2.6) Question – A.3.a.RO
		Requirements for High Radiation entry 2.3.10 (2.9) Question – A.3.b.RO
A.4	EMERGENCY PLAN	Action in the event of a fire on-site 2.4.27 (3.0) Question – A.4.a.RO
		Notification requirements for an ALERT declaration 2.4.43 (2.8) Question – A.4.b.RO

Facility: SSES Date of Examination: 08/12/02
Exam Level (circle one): RO / SRO(I) / SRO(U) Operating Test No.: B-SRO-I

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a. 239001 (4.0) Main Steam Line Isolation and Quick Recovery in Accordance with ON-181-001	N,S	3
b. 259002 (3.7) Respond to a Failure of "A" RFPT SPD/CTL/Demand Signal in Accordance with ON-145-001	M,S,A	2
c. 215004 (3.5) Bypass SRM Channel "C" Rod Block Input to RMCS	N,S,L	7
d. 209001 (3.8) Perform Manual Startup Component of Core Spray System in Accordance with OP-151-001	M,S,A	2
e. 223002/295037 (3.5) Bypass MSIV and CIG Interlocks During an ATWS and Restore CIG	M,S,A	8
f. 211000 (4.1) Initiate the SBLC System in Accordance with OP-153-001 with RWCU F004 Valve Failing to Isolate	D,S,A	1
g. 206000 (4.1) Recovery from a Manual Closure of HPCI Isolation Valves with an Initiation Signal Present with a Steam Leak Developing	D,S,A	2

B.2 Facility Walk-Through

a. 295037 (3.7/3.9)/ Connect SLC System Storage Tank to RCIC System in accordance with ES-150-002	D,R	4,1
b. 262001 (3.4) Place the Vital AC Un-interruptible Power Supply AC System in Service in Accordance with OP-157-001	D	6
c. 223001 (3.7) Start a Containment Hydrogen Recombiner IAW OP-273-001	D	5

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: SSES Date of Examination: 08/12/02
Exam Level (circle one): RO / SRO(I) / SRO(U) Operating Test No.: B-SRO-U

B.1 Control Room Systems		
System / JPM Title	Type Code*	Safety Function
a. 239001 (4.0) Main Steam Line Isolation and Quick Recovery in Accordance with ON-181-001	N,S	3
b.		
c.		
d. 209001 (3.8) Perform Manual Startup Component of Core Spray System in Accordance with OP-151-001	M,S,A	2
e.		
f. 211000 (4.1) Initiate the SBLC System in Accordance with OP-153-001 with RWCU F004 Valve Failing to Isolate	D,S,A	1
g.		
B.2 Facility Walk-Through		
a. 295037 (3.7/3.9)/ Connect SLC System Storage Tank to RCIC System in accordance with ES-150-002	D,R	4,1
b. 262001 (3.4) Place the Vital AC Un-interruptible Power Supply AC System in Service in Accordance with OP-157-001	D	6
c.		

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: SSES Date of Examination: 08/12/02
Exam Level (circle one): RO / SRO(I) / SRO(U) Operating Test No.: B-RO

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a. 239001 (4.0) Main Steam Line Isolation and Quick Recovery in Accordance with ON-181-001	N,S	3
b. 259002 (3.7) Respond to a Failure of "A" RFPT SPD/CTL/Demand Signal in Accordance with ON-145-001	M,S,A	2
c. 215004 (3.5) Bypass SRM Channel "C" Rod Block Input to RMCS	N,S,L	7
d. 209001 (3.8) Perform Manual Startup Component of Core Spray System in Accordance with OP-151-001	M,S,A	2
e. 223002/295037 (3.5) Bypass MSIV and CIG Interlocks During an ATWS and Restore CIG	M,S,A	8
f. 211000 (4.1) Initiate the SBLC System in Accordance with OP-153-001 with RWCU F004 Valve Failing to Isolate	D,S,A	1
g. 206000 (4.1) Recovery from a Manual Closure of HPCI Isolation Valves with an Initiation Signal Present with a Steam Leak Developing	D,S,A	2
B.2 Facility Walk-Through		
a. 295037 (3.7/3.9)/ Connect SLC System Storage Tank to RCIC System in accordance with ES-150-002)	D,R	4,1
b. 262001 (3.4) Place the Vital AC Un-interruptible Power Supply AC System in Service in Accordance with OP-157-001	D	6
c. 223001 (3.7) Start a Containment Hydrogen Recombiner IAW OP-273-001	D	5

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: SSES Scenario No.: 1 Op-Test No.: C1

Examiners: Operators: US - #2/ #4/ #6
PCOM - #1/ #3/ #5
PCOP - #9/#10/#11

Initial Conditions: 100% Rated Power
B Emergency Diesel Generator was started and synchronized to the bus for surviellence testing 4 hours ago, RCIC Out Of Service due to oil system contamination.

Turnover: Shutdown the B Emergency Diesel Generator
Continue normal operations

Event No.	Malf. No.	Event Type*	Event Description
1		N	Unload and secure B EDG
2	BR03	I	EDG B output breaker trips on overcurrent
3	RP158008A	C	Trip of RPS A MG Set motor
4	RD155008	C	Control rod scrams when RPS A de-energizes (fuse)
5	RD155006	C	Control rod sticks at position 10
6		R	20% Power reduction due stuck rod
7	RR164010		Small Leak in Drywell
8		C	HPCI auto Start Failure
9	MS183007	M	A MSL leak inside drywell
10	MV07	C	DW Spray Valve F021 Fail to Open

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

Facility: SSES Scenario No.: 2 Op-Test No.: C1

Examiners: Operators: US - #1/ #3/ #5
PCOM - #7/ #10/#11
PCOP - #2/ #4/ #6

Initial Conditions: 100% Rated Power
High Pressure Coolant Injection is Inoperable due to a failed governor valve

Turnover: Swap operating CRD pumps

Event No.	Malf. No.	Event Type*	Event Description
1		N	Secure A CRD pump and Start B CRD pump
2		R	Power Control requests power drop of 100 MWe
3	FW145009A	C	Trip of RFPT A
4	NM178012D	I	Recirc flow Unit failure downscale
5	PM03 RD155019	C	Loss of CRD Flow / INOP Accumulator
6	RP158003	M	Failure to scram-RPS relays fail to de-energize
7	PM03	C	SLC System Failure
8	TC193001	C	Main turbine trip
9	RC150002	I	RCIC Speed Controller Failure
10	BR05	C	Loss of Aux bus 11A/B

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

Facility: SSES Scenario No.: 3 Op-Test No.: C1

Examiners: _____ Operators: : US - #7/ #X/ #8
_____ PCOM - #9/ #4/ #6
_____ PCOP - #1/ #3/ #5

Initial Conditions: 50% Rated Power
Standby Liquid pump 1B is Inoperable while Maintenance investigates a high motor vibration

Turnover: Transfer SUB 10 to SUT 10 then continue power ascension

Event No.	Malf. No.	Event Type*	Event Description
1		N	Transfer SUB 10 to SUT 10
2		R	Continue power ascension to raise power
3	TR02	I	B Feedwater Flow Transmitter Fails Low
4	TH02	I	Inadvertent HPCI Isolation Due to Failed Room Temperature Instrument
5	IA118002	C	Loss of Instrument Air
6	RR164011A 0-40%	M	Recirc loop B suction Rupture DBA
7	RL01	C	AUTO ADS Logic Failure
8	MV06:HV15 1F015B	C	Loop B RHR Injection Valve Fails to Open

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

Facility: SSES Scenario No.: 4 Op-Test No.: C1

Examiners: Operators: : US - #8
PCOM - #2
PCOP - #7

Initial Conditions: 90% Rated Power
B EHC pump is OOS for breaker maintenance
RHR Loop A has just been secured from Suppression Pool Cooling and RHRSW pump 1A is running for vibration data

Turnover: Secure RHRSW pump 1A once data has been taken

Event No.	Malf. No.	Event Type*	Event Description
1		N	Secure RHRSW Pump 1A
2	TR02	I	RHRSW Radiation Monitor Fails Upscale
3	PM03	C	Loss of Isolate Bus Duct Cooling
4		R	Power reduction to lower generator current to <19,000 amps
5	EG198004	C	Generator Lockout/Turbine Trip
6	RP158007 B	M	RPS B Failure to Trip - ATWS
7	SL153001 A/B	C	SLC Squibb Valves Fail
8	PM03	C	B EHC Pump Trip

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

Facility: SSES Scenario No.: 5 (SPARE) Op-Test No.: C1

Examiners: _____ Operators: SRO-I /SRO-U
_____ SRO-I
_____ RO

Initial Conditions: 100% Rated Power
B CRD pump is OOS for breaker maintenance
1B Condensate pump has possible ground

Turnover: Reduce power and shutdown 1B Condensate pump

Event No.	Malf. No.	Event Type*	Event Description
1		R	Reduce reactor power for pump removal
2		N	Secure 1B Condensate pump
3		I	"A" Narrow Range level instrument fails upscale
4	RR179003	C	Fuel clad failure ramped
5	RP158007 A	I	Failure of a RPS to trip – Half scram failure
6	MS183008	M	MSL leak Inside Turbine Building
7		C	"D" MSL failure to isolate – stem binding

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