Facility: Columbia Date of Exam: October, 2009

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	5	3	N/A			4	3	N/A		2	20	5	2	7
	2	1	2	0				2	1			1	7	3	0	3
	Tier Totals	4	7	3				6	4			3	27	8	2	10
2. Plant Systems	1	2	2	2	4	2	3	2	2	3	2	2	26	3	2	5
	2	2	1	0	2	1	1	0	1	2	1	1	12	2	1	3
	Tier Totals	4	3	2	6	3	4	2	3	5	3	3	38	5	3	8
3. Generic Knowledge and Abilities Categories		1			2			3			4		10	1	2	3	4	7
		2			4			1			3			2	1	2	2	

Note:

1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).
2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.
3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.
4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.
5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
7.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.
8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.
9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

ES-401	BWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO / SRO)							Form ES-401-1	
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4		x					295001 AK2.02 Knowledge of the interrelations between Partial or Complete Loss of Forced Core Flow Circulation and the following: Core flow indication	3.4	1
295003 Partial or Complete Loss of AC / 6	x						295003 AK1.06 Knowledge of the operational implications of the following concepts as they apply to Partial or Complete Loss of A.C. Power: Station blackout	3.8	2
295004 Partial or Total Loss of DC Power / 6				x			295004 AA1.02 Ability to operate and/or monitor the following as they apply to Partial or Complete Loss of D.C. Power: Systems necessary to assure safe plant shutdown	3.8	3
295005 Main Turbine Generator Trip / 3		x					295005 AK2.02 Knowledge of the interrelations between Main Turbine Generator Trip and the following: Feedwater temperature	2.9	4
295006 SCRAM / 1					x		295006 AA2.02 Ability to determine and/or interpret the following as they apply to SCRAM: Control rod position	4.3	5
295016 Control Room Abandonment / 7				x			295016 AA1.05 Ability to operate and/or monitor the following as they apply to Control Room Abandonment: D.C. Electrical Distribution	2.8	6
295018 Partial or Total Loss of CCW / 8						x	295018 2.2.44 Ability to interpret control room indications to verify the status and| operation of a system, and understand how operator actions and directives affect plant and system conditions	4.2	7
295019 Partial or Total Loss of Inst. Air / 8		x					295019 AK2.18 Knowledge of the interrelations between Partial or Complete Loss of Instrument Air and the following: ADS	3.5	8
295021 Loss of Shutdown Cooling / 4	x						295021 AK1.02 Knowledge of the operational implications of the following concepts as they apply to Loss of Shutdown Cooling: Thermal stratification	3.3	9
295023 Refueling Acc / 8				x			295023 AA1.02 Ability to operate and/or monitor the following as they apply to Refueling Accidents: Fuel Pool Cooling and Cleanup system	2.9	10
295024 High Drywell Pressure / 5				x			295024 EA1.04 Ability to operate and/or monitor the following as they apply to High Drywell Pressure: RHR/LPCI	4.1	11
295025 High Reactor Pressure / 3			x				295025 EK3.02 Knowledge of the reasons for the following responses as they apply to High Reactor Pressure: Recirculation pump trip	3.9	12
295026 Suppression Pool High Water Temp. / 5						x	295026 2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc.	3.9	13
295027 High Containment Temperature / 5							N/A For Columbia		
295028 High Drywell Temperature / 5		x					295028 EK2.01 Knowledge of the interrelations between High Drywell Temperature and the following: Drywell spray	3.7	14

295030 Low Suppression Pool Water Level / 5					x		295030 EA2.02 Ability to determine and/or interpret the following as they apply to Low Suppression Pool Water Level: Suppression pool temperature	3.9	15
295031 Reactor Low Water Level / 2	x						295031 EK1.01 Knowledge of the operational implications of the following concepts as they apply to Reactor Low Water Level: Adequate core cooling	4.6	16
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1			x				295037 EK3.03 Knowledge of the reasons for the following responses as they apply to Scram Condition Present and Reactor Power Above APRM Downscale or unknown: Lowering reactor water level	4.1	17
295038 High Off-site Release Rate / 9		x					295038 EK2.03 Knowledge of the interrelations between High Off-Site Release Rate and the following: Plant ventilation systems	3.6	18
600000 Plant Fire On Site / 8					x		600000 AA2.17 Ability to determine and interpret the following as they apply to Plant Fire in site: Systems that may be affected by the fire	3.1	19
700000 Generator Voltage and Electric Grid Disturbances / 6			x				700000 AK3.02 Knowledge of the reasons for the following responses as they apply to Generator Voltage and Electric Grid Disturbances: Actions contained in abnormal operating procedure for voltage and grid disturbances	3.6	20
K/A Category Totals:	3	5	3	4	3	2	Group Point Total: 20		20/7

ES-401 BWR Examination Outline Form ES-401-1
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO / SRO)

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295002 Loss of Main Condenser Vacuum / 3				x			295002 AA1.03 Ability to operate and/or monitor the following as they apply to Loss of Main Condenser Vacuum: RPS	3.4	21
295007 High Reactor Pressure / 3		x					295007 AK2.05 Knowledge of the interrelationships between High Reactor Pressure and the following: Shutdown Cooling	2.9	22
295008 High Reactor Water Level / 2									
295009 Low Reactor Water Level / 2									
295010 High Drywell Pressure / 5									
295011 High Containment Temp / 5									
295012 High Drywell Temperature / 5									
295013 High Suppression Pool Temp. / 5									
295014 Inadvertent Reactivity Addition / 1						x	295014 G 2.1.36 Inadvertent Reactivity Addition. Knowledge of the procedurals and limitations associated with core alterations	3.0	24
295015 Incomplete SCRAM / 1	x						295015 AK1.02 Knowledge of the operational implications of the following as they apply to Incomplete Scram: Cooldown effects on reactor power	3.9	23
295017 High Off-site Release Rate / 9									
295020 Inadvertent Cont. Isolation / 5 & 7									
295022 Loss of CRD Pumps / 1									
295029 High Suppression Pool Water Level / 5		x					295029 EK2.05 Knowledge of the interrelationship between High Suppression Pool Water Level and the following: Containment/Drywell vacuum breakers	3.1	25
295032 High Secondary Containment Area Temperature / 5									
295033 High Secondary Containment Area Radiation Levels / 9				x			295013 EA1.03 Ability to operate and/or monitor the following as they apply to High Secondary Containment Area Radiation Levels: Secondary Containment Ventilation	3.8	26
295034 Secondary Containment Ventilation High Radiation / 9									
295035 Secondary Containment High Differential Pressure / 5									
295036 Secondary Containment High Sump/Area Water Level / 5					x		295036 EA2.03 Ability to determine and/or interpret the following as they apply to Secondary Containment High Sump/Area Water Level: Cause of the high water level	3.4	27
500000 High CTMT Hydrogen Conc. / 5									
K/A Category Point Totals:	1	2	0	2	1	1	Group Point Total: 7		7/3

ES-401 BWR Examination Outline Form ES-401-1
Plant Systems - Tier 2/Group 1 (RO / SRO)

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)	IR	#
203000 RHR/LPCI: Injection Mode						x						203000 K6.01 Knowledge of the effect that a loss or malfunction of the following will have on the RHR/LPCI Injection Mode: A.C. Electrical Power	3.6	28
205000 Shutdown Cooling				x								205000 K4.03 Knowledge of Shutdown Cooling System (RHR Shutdown Cooling Mode) design feature(s) and/or interlocks which provide for the following: Low reactor water level	3.8	29
205000 Shutdown Cooling										x		205000 A4.04 Ability to manually operate and/or monitor in the control room: Heat Exchanger cooling water valves	3.4	50
206000 HPCI												N/A for Columbia		
207000 Isolation Condenser												N/A for Columbia		
209001 LPCS											x	209001 Low Pressure Core Spray; 2.2.44 Ability to interpret control room indications to verify status and operation of a system, and understand how operator actions and directives affect plant and system conditions	4.2	30
209002 HPCS							x					209002 A1.05 Ability to predict and/or monitor changes in parameters associated with the High Pressure Core Spray System controls including: Suppression Pool Water Level	3.3	31
211000 SLC	x											211000 K1.09 Knowledge of the physical connection and/or cause effect relationship between Standby Liquid Control and the following: Core Spray System	3.2	32
212000 RPS										x		212000 A4.12 Ability to manually operate and/or monitor in the control room: Close/open SCRAM instrument volume vent and/or drain valves	3.9	33
215003 IRM						x						215003 K6.02 Knowledge of the effect that a loss or malfunction of the following will have on the Intermediate Range Monitor system: 24/48 volt DC power	3.6	34
215004 Source Range Monitor								x				215004 A2.02 Ability to (a) predict the impacts of the following on the Source Range Monitor System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: SRM Inop condition	3.4	35
215005 APRM / LPRM				x								215005 K4.02 Knowledge of Average Power Range Monitor/Local Power Range Monitor System design feature(s) and/or interlocks which provide for the following: Reactor SCRAM Signals	4.1	36
215005 APRM / LPRM						x						215005 K6.07 Knowledge of the effect that a loss or malfunction of the following will have on the APRM/LPRM System: Flow converter/comparator network: Plant specific	3.2	52

217000 RCIC									x			217000 A3.01 Ability to monitor automatic operation of the Reactor Core Isolation Cooling System including: Valve Operation	3.5	37
218000 ADS		x										218000 K2.01 Knowledge of the electrical power supply to the following: ADS Logic	3.1	38
223002 PCIS/Nuclear Steam Supply Shutoff							x					223002 A1.02 Ability to predict and/or monitor changes in parameters associated with operating the Primary Containment Isolation System/Nuclear Steam Supply Shut-Off control including: Valve Closure	3.7	39
239002 SRVs									x			239002 A3.07 Ability to monitor automatic operation of the Relief/Safety Valves including: Reactor Water Level	3.8	40
259002 Reactor Water Level Control				x								259002 K4.14 Knowledge of the Reactor Water Level Control System design feature(s) and/or interlocks which provide for the following: Selection of various instruments to provide reactor water level input	3.4	41
261000 SGTS			x									261000 K3.06 Knowledge of the effect that a loss or malfunction of the Standby Gas Treatment System will have on the following: Primary Containment oxygen content	3.0	42
261000 SGTS								x				261000 A2.13 Ability to predict the impacts of the following on the Standby Gas Treatment System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High secondary containment ventillation exhaust radiation	3.4	51
262001 AC Electrical Distribution											x	262001 AC Distribution System 2.4.42 Knowledge of Emergency Response Facilities	2.6	43
262001 AC Electrical Distribution					x							262001 K5.02 Knowledge of the operational implications of the following concepts as they apply to A.C. Electrical Distribution: Breaker Control	2.6	49
262002 UPS (AC/DC)			x									262002 K3.11 Knowledge of the effect that a loss or malfunction of the Uninterruptable Power Supply (AC/DC) will have on the following: MSIVs	2.8	44
262002 UPS (AC/DC)				x								262002 A4.01 Ability to manually operate and/or monitor in the control room: Transfer from alternative source to preferred source	2.8	53
263000 DC Electrical Distribution									x			263000 A3.01 Ability to monitor automatic operation of the D.C. Electrical Distribution including: Meters, dials, recorders, alarms, and indicating lights	3.3	45
264000 EDGs					x							264000 K5.05 Knowledge of the operational implications of the concepts as they apply to Emergency Generators: Paralleling A.C. power sources	3.4	46
300000 Instrument Air	x											300000 K1.04 Knowledge of the connections and/or cause effect relationship between Instrument Air System and the following: Cooling water to the compressor	2.8	47
400000 Component Cooling Water		x										400000 K2.01 Knowledge of the electrical power supplies to the following: CCW Pumps	2.9	48
K/A Category Point Totals:	2	2	2	4	2	3	2	2	3	2	2	Group Point Total:		26/5

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 2 (RO / SRO)												Form ES-401-1	
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G	K/A Topic(s)	IR	#
201001 CRD Hydraulic											x	201001 2.2.22 Control Rod Drive Hydraulic System. Knowledge of the limiting conditions for operation and safety limits	4.0	61
201002 RMCS														
201003 Control Rod and Drive Mechanism						x						201003 K6.01 Knowledge of the effect that a loss or malfunction of the following will have on the Control Rod and Drive Mechanism: Control Rod Hydraulic System	3.3	55
201004 RSCS														
201005 RCIS														
201006 RWM														
202001 Recirculation														
202002 Recirculation Flow Control														
204000 RWCU									x			204000 A3.04 Ability to monitor automatic operation of the Reactor Water Cleanup System including: Response to interlocks and trips designed to protect system components	3.4	54
214000 RPIS														
215001 Traversing In-core Probe	x											215001 K1.05 Knowledge of the physical connections and/or cause-effect relationship between Traversing In-Core Probe and the following: Primary containment isolation system	3.3	56
215002 RBM														
216000 Nuclear Boiler Inst.					x							216000 K5.09 Knowledge of the operations implications of the following concepts as they apply to Nuclear Boiler Instrumentation: Recirculation flow effects on level indications: Design Specific	2.9	58
219000 RHR/LPCI: Torus/Pool Cooling Mode														
223001 Primary CTMT and Aux.										x		223001 A4.11 Ability to manually operate and/or monitor in the control room: Drywell coolers/chillers	3.5	62
226001 RHR/LPCI: CTMT Spray Mode														
230000 RHR/LPCI: Torus/Pool Spray Mode				x								230000 K4.06 Knowledge of RHR/LPCI: Torus/Suppression Pool Spray Mode design feature(s) and/or interlocks which provide for the following: Pump minimum flow protection	2.8	64

233000 Fuel Pool Cooling/Cleanup														
234000 Fuel Handling Equipment									x			234000 A3.02 Ability to monitor automatic operation of the Fuel Handling Equipment including: Interlock Operation	3.1	65
239001 Main and Reheat Steam														
239003 MSIV Leakage Control														
241000 Reactor/Turbine Pressure Regulator														
245000 Main Turbine Gen. / Aux.														
256000 Reactor Condensate														
259001 Reactor Feedwater								x				259001 A2.03 Ability to (a) predict the impacts of the following on the Reactor Feedwater System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of condensate pumps	3.6	57
268000 Radwaste														
271000 Offgas														
272000 Radiation Monitoring		x										272000 K2.01 Knowledge of the power supplies to the following: Main Steam line Radiation Monitors	2.5	63
286000 Fire Protection				x								286000 K4.02 Knowledge of the Fire Protection System design feature(s) and/or interlocks which provide for the following: Automatic System Initiation	3.3	60
288000 Plant Ventilation														
290001 Secondary CTMT														
290003 Control Room HVAC														
290002 Reactor Vessel Internals	x											290002 K1.11 Knowledge of the physical connections and/or cause-effect relationship between Reactor Vessel Internals and the following: CRD Mechanism	2.9	59
K/A Category Point Totals:	2	1	0	2	1	1	0	1	2	1	1	Group Point Total:		12/3

Facility: Columbia		Date of Exam: October, 2009				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.45	Ability to identify and interpret diverse indications to validate the response of another indication	4.3	70		
	2.1.4	Knowledge of licensed operator responsibilities related to shift staffing, such as medical requirements, "no-solo" operation, maintenance of active license status, 10CFR55, etc	3.3	75		
	2.1.					
	Subtotal					
2. Equipment Control	2.2.6	Knowledge of the process for making changes to procedures	3.0	68		
	2.2.2	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels	4.6	71		
	2.2.39	Knowledge of the less than or equal to one hour Technical Specification action statements for systems	3.9	72		
	2.2.13	Knowledge of tagging and clearance procedures	4.1	74		
	2.2.					
	Subtotal					
3. Radiation Control	2.3.12	Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.	3.2	66		
	2.3.					
	Subtotal					
4. Emergency Procedures / Plan	2.4.8	Knowledge of procedures related to a security event (non-safeguards information)	3.2	67		
	2.4.45	Ability to prioritize and interpret the significance of each annunciator or alarm	4.1	69		
	2.4.37	Knowledge of the lines of authority during implementation of the emergency plan	3.0	73		
	2.4.					
	Subtotal					
Tier 3 Point Total				10		7

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E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4					X		AA2.05Ability to determine and/or interpret the following as they apply to partial or Complete Loss of Forced Flow Core Flow Circulation: Jet Pump operability55.43.2 and 55.43.5	3.4	4
295003 Partial or Complete Loss of AC / 6									
295004 Partial or Total Loss of DC Power / 6					X		AA2.02 Ability to determine and/or interpret the following as they apply to partial or Complete Loss of D.C. Power: Extent of partial or complete loss of D.C. power 55.43.5 & 55.43.2	3.9	16
295005 Main Turbine Generator Trip / 3									
295006 SCRAM / 1					X		AA2.06 Ability to determine and/or interpret the following as they apply to SCRAM: Cause of the reactor scram 55.43.5	3.8	14
295016 Control Room Abandonment / 7									
295018 Partial or Total Loss of CCW / 8									
295019 Partial or Total Loss of Inst. Air / 8									
295021 Loss of Shutdown Cooling / 4						X	2.4.9 Loss of Shutdown Cooling. Knowledge of low power / shutdown implications in accident (e.g. loss of coolant accident or loss of Residual Heat Removal) mitigation strategies 55.43.5 and 55.43.2	4.2	15
295023 Refueling Acc / 8									
295024 High Drywell Pressure / 5									
295025 High Reactor Pressure / 3									
295026 Supp. Pool High Water Temp. / 5									
295027 High Containment Temperature / 5							Mark III Containment Only - N/A For Columbia		
295028 High Drywell Temperature / 5					X		EA2.01 Ability to determine and/or interpret the following as they apply to High Drywell Temperature: Drywell Temperature 55.43.5	4.1	7
295030 Low Supp. Pool Water Level / 5									
295031 Reactor Low Water Level / 2									
295037 ATWS									
295038 High Off-site Release Rate / 9					X		EA2.01 Ability to determine and/or interpret the following as they apply to High Off-site Release Rate: Off-site 55.43.4	4.3	12
600000 Plant Fire On Site / 8						X	2.4.41 Knowledge of the emergency action level thresholds and classifications 55.43.5	4.6	2
700000 Generator and Grid Disturbances / 6									
K/A Category Totals:					5	2	Group Point Total: 7		20/7

ES-401	BWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (SRO)							Form ES-401-1	
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295002 Loss of Main Condenser Vacuum / 3									
295007 High Reactor Pressure / 3									
295008 High Reactor Water Level / 2									
295009 Low Reactor Water Level / 2									
295010 High Drywell Pressure / 5									
295011 High Containment Temp / 5									
295012 High Drywell Temperature / 5									
295013 High Suppression Pool Temp. / 5									
295014 Inadvertent Reactivity Addition / 1									
295015 Incomplete SCRAM / 1					X		AA2.02Ability to determine and/or interpret the following as they apply to Incomplete Scram: Control Rod Position 55.43.5	4.2	11
295017 High Off-site Release Rate / 9									
295020 Inadvertent Cont. Isolation / 5 & 7									
295022 Loss of CRD Pumps / 1					X		AA2.01 Ability to determine and/or interpret the following as they apply to Loss of CRD Pumps: Accumulator Pressure 55.43.2 and 55.43.5 and 55.43.7	3.6	10
295029 High Suppression Pool Water Level / 5									
295032 High Secondary Containment Area Temperature / 5									
295033 High Secondary Containment Area Radiation Levels / 9									
295034 Secondary Containment Ventilation High Radiation / 9									
295035 Secondary Containment High Differential Pressure / 5									
295036 Secondary Containment High Sump/Area Water Level / 5									
500000 High CTMT Hydrogen Conc. / 5					X		EA2.03Ability to determine and/or interpret the following as they apply to High Off-Site Release Rate: Radiation Levels 55.43.5	4.3	5
K/A Category Point Totals:					3	0	Group Point Total: 3		7/3

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 1 (SRO)												Form ES-401-1	
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)	IR	#
203000 RHR/LPCI: Injection Mode														
205000 Shutdown Cooling														
206000 HPCI												NOT AT CGS		
207000 Isolation (Emergency) Condenser												NOT AT CGS		
209001 LPCS														
209002 HPCS														
211000 SLC														
212000 RPS								X				A2.03 Ability to (a) predict the impacts of the following on the Reactor Protection System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Surveillance testing 55.43.2	3.5	18
215003 IRM														
215004 SRM														
215005 APRM / LPRM											X	2.2.21 APRM/LPRM System Knowledge of pre and post maintenance operability requirements 55.43.2	4.1	13
217000 RCIC											X	2.2.36 Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations 55.43.2	4.2	8
218000 ADS								X				A2.03 Ability to (a) predict the impacts of the following on the Automatic Depressurization System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of air supply to the ADS valves 55.43.5	3.6	21
223002 PCIS/NS4														
239002 SRVs														
259002 Reactor Water Level Control														
261000 SGTS														
262001 AC Elect. Distribution														
262002 UPS (AC/DC)								X				A2.01 Ability to (a) predict the impacts of the following on the UPS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Under Voltage 55.43.5	2.8	1
263000 DC Elect. Distribution														
264000 EDGs														
300000 Instrument Air														
400000 Component Cooling Water														
K/A Category Point Totals:								3			2	Group Point Total: 5		26/5

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 2 (SRO)												Form ES-401-1	
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)	IR	#
201001 CRD Hydraulic														
201002 RMCS														
201003 Control Rod and Drive Mechanism														
201004 RSCS														
201005 RCIS														
201006 RWM														
202001 Recirculation														
202002 Recirculation Flow Control								X				A2.09 Ability to (a) predict the impacts of the following on the Recirculation Flow Control System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Recirculation Flow mismatch 55.43.2 & 55.43.6	3.3	3
204000 RWCU														
214000 RPIS														
215001 Traversing In-core Probe														
215002 RBM														
216000 Nuclear Boiler Inst.														
219000 RHR/LPCI: Torus/Pool Cooling Mode														
223001 Primary CTMT and Aux.														
226001 RHR/LPCI: CTMT Spray Mode								X				A2.17 Ability to (a) predict the impacts of the following on the RHR/LPCI Containment Spray System Mode; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High containment / drywell temperature 55.43.5	3.2	20
230000 RHR/LPCI: Torus/Pool Spray Mode														
233000 Fuel Pool Cooling/Cleanup														
234000 Fuel Handling Equipment														
239001 Main and Reheat Steam														
239003 MSIV Leakage Control														
241000 Reactor/Turbine Pressure Regulator														
245000 Main Turbine Gen. / Aux.														

256000 Reactor Condensate													
259001 Reactor Feedwater													
268000 Radwaste													
271000 Offgas													
272000 Radiation Monitoring													
286000 Fire Protection													
288000 Plant Ventilation													
290001 Secondary CTMT													
290003 Control Room HVAC										X	2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation 55.43.2	4.7	19
290002 Reactor Vessel Internals													
K/A Category Point Totals:							2			1	Group Point Total: 3		12/3

Facility: Columbia Date of Exam: October 2009

Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.34	Knowledge of the primary and secondary plant chemistry limits 55.43.5			3.5	17
	2.1.37	Knowledge of procedures, guidelines, or limitations associated with reactivity management 55.43.6			4.6	24
	2.1.					
	2.1.					
	2.1.					
	2.1.					
	Subtotal					
2. Equipment Control	2.2.11	Knowledge of the process for controlling temporary design changes 55.43.3			3.3	9
	2.2.					
	2.2.					
	2.2.					
	2.2.					
	2.2.					
	Subtotal					
3. Radiation Control	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions 55.43.4			3.7	23
	2.3.6	Ability to approve release permits 55.43.4			3.8	22
	2.3.					
	2.3.					
	2.3.					
	2.3.					
	Subtotal					
4. Emergency Procedures / Plan	2.4.30	Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as State, the NRC, or the transmission system operator 55.43.5			4.1	6
	2.4.32	Knowledge of operator response to loss of all annunciators 55.43.5			4.0	25
	2.4.					
	2.4.					
	2.4.					
	2.4.					
	Subtotal					
Tier 3 Point Total						7