

Facility: **Calvert Cliffs** Date of Exam: **December 08, 2008**

Tier	Group	RO K/A Category Points											SRO-Only Points				
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2	G*	Total	
1. Emergency & Abnormal Plant Evolutions	1	3	3	3	N/A			3	3	N/A			3	18	3	3	6
	2	1	1	2	N/A			2	2	N/A			1	9	2	2	4
	Tier Totals	4	4	5	N/A			5	5	N/A			4	27	5	5	10
2. Plant Systems	1	3	2	3	3	2	2	3	3	2	2	3	28	3	2	5	
	2	1	0	1	1	1	1	1	1	1	1	1	10	0	2	3	
	Tier Totals	4	2	4	4	3	3	4	4	3	3	4	38	5	3	8	
3. Generic Knowledge and Abilities Categories				1	2	3	4	10	1	2	3	4	7	3	2	3	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

PWR Examination Outline

Form ES-401-2

ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1- Reactor Operator						Form ES-401-2	
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000007 (CE/E02) Reactor Trip - Stabilization - Recovery / 1		X					EK2.03 - Reactor trip status panel	3.5	
000008 Pressurizer Vapor Space Accident / 3	X						AK1.02 - Change in leak rate with change in pressure	3.1	
000009 Small Break LOCA / 3			X				EK3.26 - Maintenance of RCS subcooling	4.4	
000011 Large Break LOCA / 3						X	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	
000015/17 RCP Malfunctions / 4		X					AK2.07 - RCP seals	2.9	
000022 Loss of Rx Coolant Makeup / 2				X			AA1.03 - PZR level trend	3.2	
000025 Loss of RHR System / 4	X						AK1.01 - Loss of RHRS during all modes of operation	3.9	
000026 Loss of Component Cooling Water / 8						X	2.2.40 - Ability to apply technical Specifications for a system.	3.4	
000029 ATWS / 1				X			EA1.08 – Reactor trip switch pushbutton	4.5	
000038 Steam Gen. Tube Rupture / 3	X						EK1.01 - Use of steam tables	3.1	
000040 (CE/E05) Steam Line Rupture - Excessive Heat Transfer / 4						X	2.4.45 – Ability to prioritize and interpret the significance of each annunciator or alarm.	4.1	
000054 (CE/E06) Loss of Main Feedwater / 4			X				EK3.3 – Manipulation of controls required to obtain desired operating results during abnormal and emergency situations.	3.2	
000055 Station Blackout / 6			X				EK3.02 - Actions contained in EOP for loss of offsite and onsite power	4.3	
000056 Loss of Off-site Power / 6					X		AA2.73 - PZR heater on/off	3.5	
000057 Loss of Vital AC Inst. Bus / 6				X			AA1.06 - Manual control of components for which automatic control is lost	3.5	
000058 Loss of DC Power / 6					X		AA2.01 - That a loss of dc power has occurred; verification that substitute power sources have come on line	3.7	
000065 Loss of Instrument Air / 8					X		AA2.01 - Cause and effect of low-pressure instrument air alarm	2.9	
000077 Generator Voltage and Electric Grid Disturbances / 6		X					AK2.06 - Reactor power	3.9	
K/A Category Totals:	3	3	3	3	3	3	Group Point Total:	18	

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PWR Examination Outline

Form ES-401-2

ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 – Reactor Operator							Form ES-401-2	
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#	
000059 Accidental Liquid RadWaste Rel. / 9					X		AA2.02 The permit for liquid radioactive waste release	2.9		
000061 ARM System Alarms / 7			X				AK3.02 - Guidance contained in alarm response for ARM system	3.4		
000067 Plant Fire On-site / 8						X	2.2.42 - Ability to recognize system parameters that are entry-level conditions for Technical Specifications	3.9		
000068 (BW/A06) Control Room Evac. / 8		X					AK2.02 - Reactor trip system	3.7		
000069 (W/E14) Loss of CTMT Integrity / 5				X			AA1.03 - Fluid systems penetrating containment	2.8		
000074 (W/E06&E07) Inad. Core Cooling / 4						X	EA2.06 - Changes in PZR level due to PZR steam bubble transfer to the RCS during inadequate core cooling	4.0		
CE/A13 - Natural Circ. / 4		X					AK2.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.0		
CE/A16 Excess RCS Leakage / 2	X						AK1.2 - Normal, abnormal and emergency operating procedures associated with (Excess RCS Leakage)	3.0		
CE/E09 Functional Recovery				X			EA1.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	4.2		
K/A Category Point Totals:	1	2	1	2	2	1	Group Point Total:	9		

PWR Examination Outline														Form ES-401-2	
Plant Systems - Tier 2/Group 1- Reactor Operator															
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	#	
003 Reactor Coolant Pump						X						K6.14 – Starting Requirements	2.6		
003 Reactor Coolant Pump											X	2.1.31 - Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup.	4.6		
004 Chemical and Volume Control					X							K5.14 - Reduction process of gas concentration in RCS: vent-accumulated non-condensable gases from PZR bubble space, depressurized during cooldown or by alternately heating and cooling (spray) within allowed pressure band (drive more gas out of solution)	2.5		
005 Residual Heat Removal					X							K5.02 - Need for adequate subcooling	3.4		
006 Emergency Core Cooling									X			A3.04 - Cooling water systems	3.8		
006 Emergency Core Cooling		X										K2.02 - Valve operators for accumulators	2.5		
007 Pressurizer Relief/Quench Tank			X									K3.01 - Containment	3.3		
008 Component Cooling Water		X										K2.02 - CCW pump, including emergency backup	3.0		
008 Component Cooling Water											X	2.4.1 - Knowledge of EOP entry condition and immediate action steps.	4.6		
010 Pressurizer Pressure Control							X					A1.06 - RCS heatup and cooldown effect on pressure	3.1		
012 Reactor Protection						X						K6.10 - Permissive circuits	3.3		
013 Engineered Safety Features Actuation	X											K1.18 - Premature reset of ESF actuation	3.7		
022 Containment Cooling				X								K4.04 - Cooling of control rod drive motors	2.8		
022 Containment Cooling			X									K3.01 – Containment equipment subject to damage by high or low temperature, humidity, and pressure	2.9		
026 Containment Spray	X											K1.01 - ECCS	4.2		
026 Containment Spray											X	2.2.37 – Ability to determine operability and/or availability of safety related equipment.	3.6		

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PWR Examination Outline

Form ES-401-2

ES-401	PWR Examination Outline Plant Systems - Tier 2/Group 1- Reactor Operator (continued)											Form ES-401-2		
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)	IR	#
039 Main and Reheat Steam							X					A1.05 - RCS T-ave	3.2	
059 Main Feedwater								X				A2.05 - Rupture in MFW suction or discharge line	3.1	
061 Auxiliary/Emergency Feedwater				X								K4.14 - AFW automatic isolation	3.5	
062 AC Electrical Distribution										X		A4.01 - All breakers (including available switchyard)	3.1	
062 AC Electrical Distribution							X					A1.01 - Significance of D/G load limits	3.4	
063 DC Electrical Distribution								X				A2.01 - Grounds	2.5	
064 Emergency Diesel Generator								X				A2.18 - Consequences of premature opening of breaker under load	2.6	
073 Process Radiation Monitoring			X									K3.01 - Radioactive effluent releases	3.6	
076 Service Water										X		A4.02 - SWS valves	2.6	
076 Service Water				X								K4.06 - Service water train separation	2.8	
078 Instrument Air									X			A3.01 - Air pressure	3.1	
103 Containment	X											K1.01 - CCS	3.6	
K/A Category Point Totals:	3	2	3	3	2	2	3	3	2	2	3	Group Point Total:	28	

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PWR Examination Outline

Form ES-401-2

ES-401	PWR Examination Outline Plant Systems - Tier 2/Group 2 - Reactor Operator											Form ES-401-2		
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)	IR	#
001 Control Rod Drive								X				A2.07 - Effect of reactor trip on primary and secondary parameters and systems	4.1	
027 Containment Iodine Removal										X		A4.02 - Remote operation and handling of iodine filters	2.8	
033 Spent Fuel Pool Cooling							X					A1.01 - Spent fuel pool water level	2.7	
035 Steam Generator						X						K6.01 - MSIVs	3.2	
041 Steam Dump/Turbine Bypass Control					X							K5.07 - Reactivity Effects	3.5	
055 Condenser Air Removal	X											K1.06 - PRM system	2.6	
056 Condensate											X	2.4.6 - Knowledge of EOP mitigation strategies.	3.7	
068 Liquid Radwaste									X			A3.02 - Automatic isolation	3.8	
071 Waste Gas Disposal			X									K3.04 - Ventilation system	2.7	
086 Fire Protection				X								K4.02 - Maintenance of fire header pressure	3.0	
K/A Category Point Totals:	1	0	1	Group Point Total:	10									

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ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1- Sr. Reactor Operator						Form ES-401-2	
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000015/17 RCP Malfunctions / 4						X	2.1.19 - Ability to use plant computers to evaluate system or component status.	3.8	
000027 Pressurizer Pressure Control System Malfunction / 3					X		AA2.10 - PZR heater energized/de-energized condition	3.6	
000040 Steam Line Rupture - Excessive Heat Transfer / 4						X	2.4.23 - Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.	4.4	
000054 Loss of Main Feedwater / 4					X		AA2.01 - Occurrence of reactor and/or turbine trip	4.4	
000062 Loss of Nuclear Svc Water / 4					X		AA2.01 - Location of a leak in the SWS	3.5	
CE/E02 Reactor Trip - Stabilization - Recovery / 1						X	2.4.41 - Knowledge of the emergency action level thresholds and classifications.	4.6	
K/A Category Totals:	0	0	0	0	3	3	Group Point Total:	6	

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PWR Examination Outline

Form ES-401-2

ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 - Sr. Reactor Operator							Form ES-401-2	
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#	
000001 Continuous Rod Withdrawal / 1						X	AA2.04 - Reactor power and its trend	4.3		
000003 Dropped Control Rod / 1						X	2.4.1 - Knowledge of EOP entry conditions and immediate action steps.	3.6		
000051 Loss of Condenser Vacuum						X	AA2.01 – Cause of low vacuum condition	2.7		
000033 Loss of Intermediate Range NI / 7						X	2.4.20 - Knowledge of operational implications of EOP warnings, cautions, and notes.	4.3		
K/A Category Point Totals:	0	0	0	0	2	2	Group Point Total:	4		

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ES-401	PWR Examination Outline Plant Systems - Tier 2/Group 1- Sr. Reactor Operator											Form ES-401-2		
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)	IR	#
005 Residual Heat Removal								X				A2.02 - Pressure transient protection during cold shutdown	3.7	
013 Engineered Safety Features Actuation											X	2.1.45 - Ability to identify and interpret diverse indications to validate the response of another indication.	4.3	
061 Auxiliary/Emergency Feedwater								X				A2.08 - Flow rates expected from various combinations of AFW pump discharge valves	2.9	
073 Process Radiation Monitoring											X	2.4.6 - Knowledge of EOP mitigation strategies.	4.7	
078 Instrument Air								X				A2.01 - Air dryer and filter malfunctions	2.9	
K/A Category Point Totals:	0	0	0	0	0	0	0	3	0	0	2	Group Point Total:	5	

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PWR Examination Outline

Form ES-401-2

ES-401	PWR Examination Outline Plant Systems - Tier 2/Group 2 – Sr. Reactor Operator											Form ES-401-2		
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)	IR	#
015 Nuclear Instrumentation								X				A2.04 - Effects on axial flux density of control rod alignment and sequencing, xenon production and decay, and boron vs. control rod reactivity changes	3.8	
045 Main Turbine Generator								X				A2.17 - Malfunction of electrohydraulic control	2.9	
072 Area Radiation Monitoring											X	2.2.37 – Ability to determine operability and/or availability of safety related equipment.	4.6	
K/A Category Point Totals:	0	0	0	0	0	0	0	2	0	0	1	Group Point Total:	3	

Facility: Calvert Cliffs		Date of Exam: December 08, 2008				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.3	Knowledge of shift or short-term relief turnover practices.	3.7		-	-
	2.1.17	Ability to make accurate, clear, and concise verbal reports	3.9		-	-
	2.1.44	Knowledge of RO duties in the control room during fuel handling, such as responding to alarms from the fuel handling area, communication with the fuel storage facility, systems operated from the control room in support of fueling operations, and supporting instrumentation.	3.9		-	-
	2.1.20	Ability to interpret and execute procedure steps.	-	-	4.6	
	2.1.40	Knowledge of refueling administrative requirements.	-	-	3.9	
	Subtotal			3		2
2. Equipment Control	2.2.1	Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.	4.5		-	-
	2.2.17	Knowledge of the process for managing maintenance activities during power operations, such as risk assessments, work prioritization, and coordination with the transmission system operator.	2.6		-	-
	2.2.43	Knowledge of the process used to track inoperable alarms.	-	-	3.3	
	Subtotal			2		1
3. Radiation Control	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.	3.2		-	-
	2.3.11	Ability to control radiation releases.	3.8		-	-
	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.	3.7		-	-
	2.3.6	Ability to approve release permits.	-	-	3.8	
	2.3.15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	-	-	3.1	
Subtotal			3		2	
4. Emergency Procedures / Plan	2.4.3	Ability to identify post-accident instrumentation.	3.7		-	-
	2.4.5	Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions.	3.7		-	-
	2.4.11	Knowledge of abnormal condition procedures.	-	-	4.2	
	2.4.45	Ability to prioritize and interpret the significance of each annunciator or alarm.	-	-	4.3	
	Subtotal			2		2
Tier 3 Point Total			10		7	

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Record of Rejected K/As

Form ES-401-4

Tier / Group	Randomly Selected K/A	Reason for Rejection
RO - 1/1	EA1.02	Replaced 029, EA1.02 with 029, EA1.08. K/A EA1.02 is an inappropriate match for the E/APE # selected. CCNPP standard post-trip actions for an ATWS do not include boration from the RWST.
RO - 2/1	025	Replaced 025, K3.01 with 022, K3.01. Calvert Cliffs does not have ice condensers.
RO - 2/2	K2.02	Replaced K2.02 with K3.04. Calvert Cliffs does not have an Integrated Control System.
RO - 2/2	A3.01	Replaced A3.01 with A3.02. Calvert Cliffs Reactor Coolant Waste Evaporators are retired-in-place
SRO - 1/1	2.1.43	Replaced 2.1.43 with 2.1.19. Poor K/A match to system
SRO - 1/2	2.4.26	Replaced K/A 2.4.26 with K/A 2.4.1. K/A 2.4.26 is an inappropriate match for the E/APE # selected. K/A 2.4.26 paired knowledge of facility fire protection with a Dropped Control Rod. K/A 2.4.1 pairs knowledge of EOP entry conditions and immediate action steps with a Dropped Control Rod.
SRO - 1/2	005 AA2.01	Replaced 005 AA2.01 with 051 AA2.01 due to over sampling of CEA Malfunctions.
SRO - 2/2	2.4.26	Replaced K/A 2.4.26 with 2.2.37. K/A 2.4.26 is an inappropriate match for the E/APE # selected. K/A 2.4.26 paired knowledge of facility fire protection with Area Radiation Monitoring. K/A 2.2.37 pairs the ability to determine operability and/or availability of safety related equipment with Area Radiation Monitoring.

CCNPP LOI-2206 Retake Exam Data

ES-401	PWR Examination Outline	Form ES-401-2
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Facility: Calvert Cliffs		Date of Exam: December 08, 2008																	
Tier	Group	RO K/A Category Points											SRO-Only Points						
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2	G*	Total			
1. Emergency & Abnormal Plant Evolutions	1	3	3	3	N/A			3	3	N/A			3	18	3	3	6		
	2	1	1	2				2	2				1	9	2	2	4		
	Tier Totals	4	4	5				5	5				4	27	5	5	10		
2. Plant Systems	1	3	2	3	3	2	2	3	3	2	2	3	28	3	2	5			
	2	1	1	1	1	0	1	1	1	1	1	1	10	0	2	3			
	Tier Totals	4	3	4	4	2	3	4	4	3	3	4	38	5	3	8			
3. Generic Knowledge and Abilities Categories					1		2		3		4		10		1	2	3	4	7
					3		2		3		2				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).
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 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.

CCNPP LOI-2206 Retake Exam Data

Tier 1/Group 1- Reactor Operator						
E/APE # / Name / Safety Function	K/A Topics	Imp #	Vision ID	Type	Cognitive Level	Exam Q #
000007 (CE/E02) Reactor Trip - Stabilization - Recovery / 1	EK2.03	3.5	Q20174	B	3	18
000008 Pressurizer Vapor Space Accident / 3	AK1.02	3.1	Q50851	N	2	26
000009 Small Break LOCA / 3	EK3.26	4.4	Q26519	B	1	2
000011 Large Break LOCA / 3	2.2.44	4.2	Q25313	B	2	4
000015/17 RCP Malfunctions / 4	AK2.07	2.9	Q38715	B	1	6
000022 Loss of Rx Coolant Makeup / 2	AA1.03	3.2	Q50992	M	2	58
000025 Loss of RHR System / 4	AK1.01	3.9	Q20393	B	2	5
000026 Loss of Component Cooling Water / 8	2.2.40	3.4	Q50770	M	1	9
000029 ATWS / 1	EA1.08	4.5	Q50651	M	2	27
000038 Steam Gen. Tube Rupture / 3	EK1.01	3.1	Q23208	B	2	22
000040 (CE/E05) Steam Line Rupture - Excessive Heat Transfer / 4	2.4.45	4.1	Q50950	N	3	55
000054 (CE/E06) Loss of Main Feedwater / 4	EK3.3	3.2	Q28472	B	2	12
000055 Station Blackout / 6	EK3.02	4.3	Q40704	B	1	8
000056 Loss of Off-site Power / 6	AA2.73	3.5	Q18107	B	2	35
000057 Loss of Vital AC Inst. Bus / 6	AA1.06	3.5	Q50852	N	2	25
000058 Loss of DC Power / 6	AA2.01	3.7	Q51132	N	2	33
000065 Loss of Instrument Air / 8	AA2.01	2.9	Q51150	M	2	1
000077 Generator Voltage & Electric Grid Disturbances / 6	AK2.06	3.9	Q50730	N	1	7

Tier 1/Group 2- Reactor Operator						
E/APE # / Name / Safety Function	K/A Topics	Imp #	Vision ID	Type	Cognitive Level	Exam Q #
000059 Accidental Liquid RadWaste Rel. / 9	AA2.02	2.9	Q50933	N	2	53
000061 ARM System Alarms / 7	AK3.02	3.4	Q24719	B	1	19
000067 Plant Fire On-site / 8	2.2.42	3.9	Q50931	B	1	51
000068 (BW/A06) Control Room Evac. / 8	AK2.02	3.7	Q50930	M	1	49
000069 Loss of CTMT Integrity / 5	AA1.03	2.8	Q50932	N	2	52
000074 (W/E06&E07) Inad. Core Cooling / 4	EA2.06	4.0	Q40348	B	2	14
CE/A13 - Natural Circ. / 4	AK2.1	3.0	Q14420	B	2	16
CE/A16 Excess RCS Leakage / 2	AK1.2	3.0	Q40701	B	2	13
CE/E09 Functional Recovery	EA1.1	4.2	Q25068	B	2	15

CCNPP LOI-2206 Retake Exam Data

Tier 2/Group 1 - Reactor Operator

E/APE # / Name / Safety Function	K/A Topics	Imp #	Vision ID	Type	Cognitive Level	Exam Q #
003 Reactor Coolant Pump	K6.14	2.6	Q14389	B	3	36
003 Reactor Coolant Pump	2.1.31	4.6	Q14376	B	1	37
004 Chemical and Volume Control	K5.14	2.5	Q50970	N	1	56
005 Residual Heat Removal	K5.02	3.4	Q37797	B	3	50
006 Emergency Core Cooling	A3.04	3.8	Q20385	B	1	10
006 Emergency Core Cooling	K2.02	2.5	Q50790	N	1	11
007 Pressurizer Relief/Quench Tank	K3.01	3.3	Q51010	N	2	60
008 Component Cooling Water	K2.02	3.0	Q20367	B	1	43
008 Component Cooling Water	2.4.1	4.6	Q20381	B	1	42
010 Pressurizer Pressure Control	A1.06	3.1	Q14353	B	2	38
012 Reactor Protection	K6.10	3.3	Q20195	B	2	39
013 Engineered Safety Features Actuation	K1.18	3.7	Q50990	N	2	57
022 Containment Cooling	K4.04	2.8	Q51131	B	1	40
022 Containment Cooling	K3.01	2.9	Q51011	N	2	61
026 Containment Spray	K1.01	4.2	Q20402	B	2	44
026 Containment Spray	2.2.37	3.6	Q17833	B	2	45
039 Main and Reheat Steam	A1.05	3.2	Q50810	N	2	17
059 Main Feedwater	A2.05	3.1	Q50993	M	2	59
061 Auxiliary/Emergency Feedwater	K4.14	3.5	Q16704	B	3	46
062 AC Electrical Distribution	A4.01	3.1	Q15852	B	2	62
062 AC Electrical Distribution	A1.01	3.4	Q20008	B	1	47
063 DC Electrical Distribution	A2.01	2.5	Q51013	N	2	64
064 Emergency Diesel Generator	A2.18	2.6	Q15971	B	2	48
073 Process Radiation Monitoring	K3.01	3.6	Q51133	B	2	75
076 Service Water	A4.02	2.6	Q51012	N	1	63
076 Service Water	K4.06	2.8	Q51031	N	2	67
078 Instrument Air	A3.01	3.1	Q25078	B	2	66
103 Containment	K1.01	3.6	Q51016	M	1	65

CCNPP LOI-2206 Retake Exam Data

Tier 2 / Group 2 - Reactor Operator						
E/APE # / Name / Safety Function	K/A Topics	Imp #	Vision ID	Type	Cognitive Level	Exam Q #
001 Control Rod Drive	A2.07	4.1	Q51032	N	3	68
027 Containment Iodine Removal	A4.02	2.8	Q51130	B	1	41
033 Spent Fuel Pool Cooling	A1.01	2.7	Q51050	N	2	72
035 Steam Generator	K6.01	3.2	Q28225	B	2	20
041 Steam Dump/Turbine Bypass Control	K5.07	3.1	Q28429	B	3	21
055 Condenser Air Removal	K1.06	2.6	Q50830	N	1	23
056 Condensate	2.4.6	3.7	Q24549	B	1	24
068 Liquid Radwaste	A3.02	3.8	Q51033	N	1	69
071 Waste Gas Disposal	K3.04	2.7	Q51051	N	2	71
086 Fire Protection	K4.02	3.0	Q34432	B	1	28

CCNPP LOI-2206 Retake Exam Data

Tier 1 / Group 1 – Sr. Reactor Operator						
E/APE # / Name / Safety Function	K/A Topics	Imp #	Vision ID	Type	Cognitive Level	Exam Q #
000015/17 RCP Malfunctions / 4	2.1.19	3.8	Q51083	N	2	89 (14)
000027 Pressurizer Pressure Control System Malfunction / 3	AA2.10	3.6	Q14490	B	2	77 (2)
000040 Steam Line Rupture - Excessive Heat Transfer / 4	2.4.23	4.4	Q51094	N	2	91 (16)
000054 Loss of Main Feedwater / 4	AA2.01	4.4	Q51072	B	1	78 (3)
000062 Loss of Nuclear Svc Water / 4	AA2.01	3.5	Q51096	N	2	93 (18)
CE/E02 Reactor Trip - Stabilization - Recovery / 1	2.4.41	4.6	Q51075	N	2	81 (6)

Tier 1 / Group 2 – Sr. Reactor Operator						
E/APE # / Name / Safety Function	K/A Topics	Imp #	Vision ID	Type	Cognitive Level	Exam Q #
000001 Continuous Rod Withdrawal / 1	AA2.04	4.3	Q19089	B	1	82 (7)
000003 Dropped Control Rod / 1	2.4.1	3.6	Q51078	B	1	83 (8)
000051 Loss of Condenser Vacuum	AA2.01	2.7	Q41651	M	2	88 (13)
000033 Loss of Intermediate Range NI / 7	2.4.20	4.3	Q51082	N	2	87 (12)

Tier 2 / Group 1 – Sr. Reactor Operator						
E/APE # / Name / Safety Function	K/A Topics	Imp #	Vision ID	Type	Cognitive Level	Exam Q #
005 Residual Heat Removal	A2.02	3.7	Q51100	N	3	99 (24)
013 Engineered Safety Features Actuation	2.1.45	4.3	Q51076	N	3	80 (5)
061 Auxiliary/Emergency Feedwater	A2.08	2.9	Q51098	N	2	97 (22)
073 Process Radiation Monitoring	2.4.6	4.7	Q51110	M	2	100 (25)
078 Instrument Air	A2.01	2.9	Q51097	M	2	96 (21)

CCNPP LOI-2206 Retake Exam Data

Tier 2 / Group 2 – Sr. Reactor Operator						
E/APE # / Name / Safety Function	K/A Topics	Imp #	Vision ID	Type	Cognitive Level	Exam Q #
015 Nuclear Instrumentation	A2.04	3.8	Q51079	N	3	85 (10)
045 Main Turbine Generator	A2.17	2.9	Q25257	B	2	95 (20)
072 Area Radiation Monitoring	2.2.37	4.6	Q51073	N	2	79 (4)

Generic Knowledge & Abilities							
Category		K/A Topics	Imp #	Vision ID	Type	Cognitive Level	Exam Q #
Conduct of Ops	RO	2.1.3	3.7	Q50870	N	1	29
	RO	2.1.17	3.9	Q26067	B	1	3
	RO	2.1.44	3.9	Q50934	N	1	54
	SRO	2.1.20	4.6	Q45189	B	1	94 (19)
	SRO	2.1.40	3.9	Q20627	B	1	76 (1)
Equipment Control	RO	2.2.1	4.5	Q25936	B	2	32
	RO	2.2.17	2.6	Q51170	N	1	34
	SRO	2.2.43	3.3	Q51099	N	1	98 (23)
Radiation Control	RO	2.3.4	3.2	Q17947	B	1	70
	RO	2.3.11	3.8	Q20605	B	1	73
	RO	2.3.14	3.7	Q50890	M	2	31
	SRO	2.3.6	3.8	Q51080	N	1	84 (9)
	SRO	2.3.15	3.1	Q24714	B	2	86 (11)
Emergency procedures / Plan	RO	2.4.3	3.7	Q24951	B	1	30
	RO	2.4.5	3.7	Q19570	B	2	74
	SRO	2.4.11	4.2	Q51095	N	2	92 (17)
	SRO	2.4.45	4.3	Q51090	N	3	90 (15)

CCNPP LOI-2206 Retake Exam Data

Parameter	Reactor Operator Test	Sr. Reactor Operator Test
Bank Questions (Maximum of 75%)	43 (57%)	8 (32%)
Modified Questions	8 (11%)	3 (12%)
New Questions (Minimum of 10 questions – 8 RO, 2 SRO)	24 (32%)	14 (56%)
Memory	30 (40%)	7 (28%)
Comprehension / Analysis (50 – 60% for RO exam)	45 (60%)	18 (72%)

Modified Questions	
Modified Question #	Original Question #
Q50992	Q14583
Q50770	Q20383
Q50651	Q19256
Q50930	Q24994
Q50993	Q50990
Q51016	Q20397
Q51110	Q28787
Q51097	Q50364
Q41651	Q41134
Q50890	Q42268
Q51150	Q20290

CCNPP LOI-2206 Retake Exam Data

Key to symbols / abbreviations:

Type:

- B = Bank Question
- M = Modified Question
- N = New Question

Cognitive Level:

- 1 = Fundamental knowledge or simple memory (stpts, definitions, facts)
- 2 = Comprehension (recognition of system interactions)
- 3 = Analysis / Synthesis / Application (use of info to predict an event or outcome or to solve a problem)

Calvert Cliffs Retake Exam

75-day Sample plan review comments:

1. The package did not describe the process for creating the sample plan. NUREG-1021 ES 401 page 4 states:

"When submitting its examination outline to the NRC, the facility licensee shall describe the process that was used to develop the examination outline (in sufficient detail for the NRC to confirm that it meets the systematic and random selection criteria). Examples of adequate documentation include (1) a statement that the facility licensee used the sampling process described in Attachment 1; (2) identification of the industry standard or widely-available commercial product that was used; or (3) a description or copy of the facility licensee's process document."

Response: The licensee provided a document stating that the sample plan was developed with the latest version of the "NRC PWR K/A exam Generator Software, NKEG, Version 1.1 developed by Westinghouse Electric Company, LLC."

2. T2G2 system 041 – there is an "X" under the K2 column but the KA is K3.04?

Response: Corrected. The K2 selection was made in error. The only K/As under K2 for system 041 were related to ICS which is a B&W system, not a CE system. The decision was made to systematically reselect the K5 category, because this category did not have any selections in Tier 2 Group 2. This would maintain the balance on the sample selection for T2G2. It was also verified that there were still 2 – K2s under the systems tier 2 sample plan. The licensee provided a replacement page for the sample plan that showed these changes. The problematic page was replaced.

3. The distribution of stem categories (K1 – A4 + G) has no statistical variation that would be expected if the sample plan had been randomly generated. For example, for Tier 1 Group 1, there are 6 possible stem categories (K1, K2, K3, K4, A1, A2, G) and 18 E/APES that are sampled. The sample plan shows a distribution as follows:

K1	K2	K3	K4	A1	A2	G	Total
3	3	3	3	3	3	3	18

This total lack of any statistical variation exists in all the other tier/group selections. At the same time, there is no apparent geometric pattern in the stem category selections that could be evidence of a random process. Unless the licensee has developed a highly sophisticated process of rebalancing the distributions, this is prima facie evidence of "cherry picking" the K/As.

Response: The latest version of the sample plan generator that is provided by the PWR Owners Group uses a K/A selection methodology that ensures that all K/A categories (stem Statements K1-K5, A1-A4 and G) are equally sampled. As a result, the old sample plan patterns of having a greater number of K/As under one category and a fewer number of K/As under other categories is no longer going to occur when the new generator is used. This was verified by looking at other exams that had been generated using this version of the sample plan generator. Two other sample plans (Calvert Cliffs June 2008 and Salem August 2008) showed this same pattern of selections (equal selections of K/A categories with no statistical variation).

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