

Facility: Surry		Date of Exam: August 2012																
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	2	2	N/A			1	2	N/A			1	9	2	2	4	
	Tier Totals	4	5	5	N/A			4	5	N/A			4	27	5	5	10	
2. Plant Systems	1	2	2	2	3	3	3	3	3	3	3	2	2	28	3	2	5	
	2	1	1	1	0	1	1	1	1	1	1	1	1	10	1	1	3	
	Tier Totals	3	3	3	3	4	4	4	4	4	4	3	3	38	5	3	8	
3. Generic Knowledge and Abilities Categories				1		2		3		4		10		1	2	3	4	7
				3		2		2		3				2	2	1	2	

- Note:
- 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).
 - 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.
 - 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.
 - 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.
 - 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.
 - Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
 - * 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.
 - 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.
 - 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.

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ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO / SRO)						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 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1		R					EK2 Knowledge of the interrelations between a reactor trip and the following: (CFR 41.7 / 45.7) EK2.02 Breakers, relays and disconnects	2.6	1
000008 Pressurizer Vapor Space Accident / 3	R						AK1. Knowledge of the operational implications of the following concepts as they apply to a Pressurizer Vapor Space Accident: (CFR 41.8 / 41.10 / 45.3) AK1.01 Thermodynamics and flow characteristics of open or leaking valves	3.2	2
000009 Small Break LOCA / 3						S	2.1.19 Ability to use plant computers to evaluate system or component status. (CFR: 41.10 / 45.12)	3.8	76
000011 Large Break LOCA / 3				R			EA1 Ability to operate and monitor the following as they apply to a Large Break LOCA: (CFR 41.7 / 45.5 / 45.6) EA1.09 Core flood tank initiation	4.3	3
000015/17 RCP Malfunctions / 4						S	AA2. Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): (CFR: 43.5 / 45.13) AA2.08 When to secure RCPs on high bearing temperature	3.5	77
000022 Loss of Rx Coolant Makeup / 2					R		AA2. Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Makeup: (CFR 43.5/ 45.13) AA2.02 Charging pump problems	3.2	4
000025 Loss of RHR System / 4						R	2.4.31 Knowledge of annunciator alarms, indications, or response procedures. (CFR: 41.10 / 45.3)	4.2	5
000026 Loss of Component Cooling Water / 8					R		AA2. Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water: (CFR: 43.5 / 45.13) AA2.06 The length of time after the loss of CCW flow to a component before that component may be damaged	2.8	6
000027 Pressurizer Pressure Control System Malfunction / 3		R					AK2. Knowledge of the interrelations between the Pressurizer Pressure Control Malfunctions and the following: (CFR 41.7 / 45.7) AK2.03 Controllers and positioners	2.6	7
						S	2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.4	78

000029 ATWS / 1				R		EA1 Ability to operate and monitor the following as they apply to a ATWS: (CFR 41.7 / 45.5 / 45.6) EA1.07 Operating switch for charging pump recirculation valve	3.4	8
000038 Steam Gen. Tube Rupture / 3				R		EK3 Knowledge of the reasons for the following responses as the apply to the SGTR: (CFR 41.5 / 41.10 / 45.6 / 45.13) EK3.01 Equalizing pressure on primary and secondary sides of ruptured S/G	4.1	9
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4				R		WE12 EK2. Knowledge of the interrelations between the (Uncontrolled Depressurization of all Steam Generators) and the following: (CFR: 41.7 / 45.7) WE12 EK2.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features. WE12 EA2. Ability to determine and interpret the following as they apply to the (Uncontrolled Depressurization of all Steam Generators) (CFR: 43.5 / 45.13) WE12 EA2.2 Adherence to appropriate procedures and operation within the limitations in the Facility's license and amendments.	3.4	10
000054 (CE/E06) Loss of Main Feedwater / 4								
000055 Station Blackout / 6				R		EK1 Knowledge of the operational implications of the following concepts as they apply to the Station Blackout : (CFR 41.8 / 41.10 / 45.3) EK1.02 Natural circulation cooling 2.4.9 Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies. (CFR: 41.10 / 43.5 / 45.13)	4.1	11
000056 Loss of Off-site Power / 6								
000057 Loss of Vital AC Inst. Bus / 6				R		AK3. Knowledge of the reasons for the following responses as they apply to the Loss of Vital AC Instrument Bus: (CFR 41.5,41.10 / 45.6 / 45.13) AK3.01 Actions contained in EOP for loss of vital ac electrical instrument bus	4.1	12
000058 Loss of DC Power / 6				R		AA1. Ability to operate and / or monitor the following as they apply to the Loss of DC Power: (CFR 41.7 / 45.5 / 45.6) AA1.01 Cross-tie of the affected dc bus with the alternate supply	3.4	13
000062 Loss of Nuclear Svc Water / 4				R		AA2. Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: (CFR: 43.5 / 45.13) AA2.01 Location of a leak in the SWS	2.9	14
000065 Loss of Instrument Air / 8				R		2.1.31 Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup. (CFR: 41.10 / 45.12)	4.6	15

W/E04 LOCA Outside Containment / 3						R	2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm. (CFR: 41.10 / 43.5 / 45.3 / 45.12)	4.1	16
W/E11 Loss of Emergency Coolant Recirc. / 4	R						EK1. Knowledge of the operational implications of the following concepts as they apply to the (Loss of Emergency Coolant Recirculation) (CFR: 41.8 / 41.10 / 45.3) EK1.2 Normal, abnormal and emergency operating procedures associated with (Loss of Emergency Coolant Recirculation).	3.6	17
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4			R				WE05 EK3. Knowledge of the reasons for the following responses as they apply to the (Loss of Secondary Heat Sink) (CFR: 41.5 / 41.10, 45.6, 45.13) WE05 EK3.2 Normal, abnormal and emergency operating procedures associated with (Loss of Secondary Heat Sink).	3.7	18
000077 Generator Voltage and Electric Grid Disturbances / 6						S	AA2. Ability to determine and interpret the following as they apply to Generator Voltage and Electric Grid Disturbances: (CFR: 41.5 and 43.5 / 45.5, 45.7, and 45.8) AA2.06 Generator frequency limitations	3.5	81
K/A Category Totals:	3	3	3	3	3	3	Group Point Total:		18
					3	3			6

000069 (W/E14) Loss of CTMT Integrity / 5				R		WE14 EK3. Knowledge of the reasons for the following responses as they apply to the (High Containment Pressure) (CFR: 41.5 / 41.10, 45.6, 45.13)	3.3	23
						WE14 EK3.4 RO or SRO function within the control room team as appropriate to the assigned position, in such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated.		
000074 (W/E06&E07) Inad. Core Cooling / 4								
000076 High Reactor Coolant Activity / 9								
W/E01 & E02 Rediagnosis & SI Termination / 3								
W/E13 Steam Generator Over-pressure / 4				R		EA1. Ability to operate and / or monitor the following as they apply to the (Steam Generator Overpressure) (CFR: 41.7 / 45.5 / 45.6)	3.1	24
						EA1.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.		
W/E15 Containment Flooding / 5					S	2.4.6 Knowledge of EOP mitigation strategies. (CFR: 41.10 / 43.5 / 45.13)	4.7	84
W/E16 High Containment Radiation / 9				R		EA2. Ability to determine and interpret the following as they apply to the (High Containment Radiation) (CFR: 43.5 / 45.13)	3.0	25
						EA2.2 Adherence to appropriate procedures and operation within the limitations in the Facility's license and amendments.		
BW/A01 Plant Runback / 1								
BW/A02&A03 Loss of NNI-X/Y / 7								
BW/A04 Turbine Trip / 4								
BW/A05 Emergency Diesel Actuation / 6								
BW/A07 Flooding / 8								
BW/E03 Inadequate Subcooling Margin / 4								
BW/E08; W/E03 LOCA Cooldown - Depress. / 4					R	2.1.20 Ability to interpret and execute procedure steps. (CFR: 41.10 / 43.5 / 45.12)	4.6	26
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4					S	WE10 EA2. Ability to determine and interpret the following as they apply to the (Natural Circulation with Steam Void in Vessel with/without RVLIS) (CFR: 43.5 / 45.13)	3.9	85
						WE10 EA2.1 Facility conditions and selection of appropriate procedures during abnormal and emergency operations.		
BW/E13&E14 EOP Rules and Enclosures								

CE/A11; W/E08 RCS Overcooling - PTS / 4					R		WE08 EA2. Ability to determine and interpret the following as they apply to the (Pressurized Thermal Shock) (CFR: 43.5 / 45.13)	3.5	27
							WE08 EA2.2 Adherence to appropriate procedures and operation within the limitations in the Facility's license and amendments.		
CE/A16 Excess RCS Leakage / 2									
CE/E09 Functional Recovery									
K/A Category Point Totals:	1	2	2	1	2	1	Group Point Total:		9
					2	2			4

ES-401	PWR Examination Outline Plant Systems - Tier 2/Group 1 (RO / SRO)											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	#
003 Reactor Coolant Pump						R						K6 Knowledge of the effect of a loss or malfunction on the following will have on the RCPS: (CFR: 41.7 / 45/5)	2.7	28
									R			K6.02 RCP seals and seal water supply		
												A3 Ability to monitor automatic operation of the RCPS, including: (CFR: 41.7 / 45.5)A3.03	3.2	29
004 Chemical and Volume Control								S				A2 Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5/ 43/5 / 45/3 / 45/5)	4.2	86
									R			A2.01 RCS pressure allowed to exceed limits		
												A2 Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5/ 43/5 / 45/3 / 45/5)	3.6	30
005 Residual Heat Removal					R							K5 Knowledge of the operational implications of the following concepts as they apply the RHRS: (CFR: 41.5 / 45.7)	3.4	32
											R	K5.02 Need for adequate subcooling		
												2.2.42 Ability to recognize system parameters that are entry-level conditions for Technical Specifications. (CFR: 41.7 / 41.10 / 43.2 / 43.3 / 45.3)	3.9	33

006 Emergency Core Cooling						S			A2 Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 45.5)	3.5	87
							R		A2.05 Improper amperage to the pump motor		
									A4 Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)	3.8	34
007 Pressurizer Relief/Quench Tank				R					A4.10 Safety parameter display system		
									K4 Knowledge of PRTS design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7)	2.6	35
							R		K4.01 Quench tank cooling		
008 Component Cooling Water									A3 Ability to monitor automatic operation of the PRTS, including: (CFR: 41.7 / 45.5)	2.7	36
									A3.01 Components which discharge to the PRT		
							R		A2 Ability to (a) predict the impacts of the following malfunctions or operations on the CCWS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13)	3.3	37
010 Pressurizer Pressure Control									A2.04 PRMS alarm		
		R							K2 Knowledge of bus power supplies to the following: (CFR: 41.7)	2.5	38
							R		K2.02 Controller for PZR spray valve		
012 Reactor Protection									A1 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PZR PCS controls including: (CFR: 41.5 / 45.5)	3.6	39
									A1.04 Effects of temperature change during solid operation		
					R				K6 Knowledge of the effect of a loss or malfunction of the following will have on the RPS: (CFR: 41.7 / 45/7)	3.1	40
									K6.03 Trip logic circuits		
							S		2.2.38 Knowledge of conditions and limitations in the facility license. (CFR: 41.7 / 41.10 / 43.1 / 45.13)	4.5	88

013 Engineered Safety Features Actuation	R																	K1 Knowledge of the physical connections and/or cause effect relationships between the ESFAS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.12 ED/G	4.1	41
																		K5 Knowledge of the operational implications of the following concepts as they apply to the ESFAS: (CFR: 41.5 / 45.7)	2.9	42
																		K5.02 Safety system logic and reliability		
022 Containment Cooling																		K4 Knowledge of CCS design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7) K4.05 Containment cooling after LOCA destroys ventilation ducts	2.6	43
025 Ice Condenser																		Not applicable to Surry		
026 Containment Spray				R														K3 Knowledge of the effect that a loss or malfunction of the CSS will have on the following: (CFR: 41.7 / 45.6) K3.02 Recirculation spray system	4.2	44
039 Main and Reheat Steam																		A4 Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) A4.04 Emergency feedwater pump turbines	3.8	45
059 Main Feedwater	R																	K1 Knowledge of the physical connections and/or cause-effect relationships between the MFW and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.02 AFW system	3.4	46
061 Auxiliary/Emergency Feedwater				R														K2 Knowledge of bus power supplies to the following: (CFR: 41.7) K2.01 AFW system MOVs	3.2	47
																		K5 Knowledge of the operational implications of the following concepts as they apply to the AFW: (CFR: 41.5 / 45.7) K5.02 Decay heat sources and magnitude	3.2	48
062 AC Electrical Distribution				R														K3 Knowledge of the effect that a loss or malfunction of the ac distribution system will have on the following: (CFR: 41.7 / 45.6) K3.03 DC system	3.7	49

ES-401	PWR Examination Outline Plant Systems - Tier 2/Group 2 (RO / SRO)												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		R										K2 Knowledge of bus power supplies to the following: (CFR: 41.7) K2.03 One-line diagram of power supplies to logic circuits	2.7	56
002 Reactor Coolant														
011 Pressurizer Level Control			R									K3 Knowledge of the effect that a loss or malfunction of the PZR LCS will have on the following: (CFR: 41.7 / 45.6) K3.01 CVCS	3.2	57
014 Rod Position Indication														
015 Nuclear Instrumentation														
016 Non-nuclear Instrumentation														
017 In-core Temperature Monitor						R						K6 Knowledge of the effect of a loss or malfunction of the following ITM system components: (CFR: 41.7 / 45.7) K6.01 Sensors and detectors	2.7	58
027 Containment Iodine Removal	R											K1 Knowledge of the physical connections and/or cause-effect relationships between the CIRS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.01 CSS	3.4	59
028 Hydrogen Recombiner and Purge Control											R	2.1.28 Knowledge of the purpose and function of major system components and controls. (CFR: 41.7)	4.1	60
029 Containment Purge											R	A4 Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) A4.04 Containment evacuation signal	3.5	61
033 Spent Fuel Pool Cooling														
034 Fuel Handling Equipment				S								K4 Knowledge of design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7) K4.03 Overload protection	3.3	91
035 Steam Generator										R		A3 Ability to monitor automatic operation of the S/G including: (CFR: 41.7 / 45.5) A3.01 S/G water level control	4.0	62
041 Steam Dump/Turbine Bypass Control														
045 Main Turbine Generator											S	2.1.27 Knowledge of system purpose and/or function. (CFR: 41.7)	4.0	92

Facility:		Date of Exam:				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.1	2.1.1 Knowledge of conduct of operations requirements. (CFR: 41.10 / 45.13)	3.8	66		
	2.1.8	2.1.8 Ability to coordinate personnel activities outside the control room. (CFR: 41.10 / 45.5 / 45.12 / 45.13)	3.4	67		
	2.1.26	2.1.26 Knowledge of industrial safety procedures (such as rotating equipment, electrical, high temperature, high pressure, caustic, chlorine, oxygen and hydrogen). (CFR: 41.10 / 45.12)	3.4	68		
	2.1.34	2.1.34 Knowledge of primary and secondary plant chemistry limits. (CFR: 41.10 / 43.5 / 45.12)			3.5	94
	2.1.13	2.1.13 Knowledge of facility requirements for controlling vital/controlled access. (CFR: 41.10 / 43.5 / 45.9 / 45.10)			3.2	95
	Subtotal				3	2
2. Equipment Control	2.2.4	2.2.4 (multi-unit license) Ability to explain the variations in control board/control room layouts, systems, instrumentation, and procedural actions between units at a facility. (CFR: 41.6 / 41.7 / 41.10 / 45.1 / 45.13)	3.6	69		
	2.2.44	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. (CFR: 41.5 / 43.5 / 45.12)	4.2	70		
	2.2.11	2.2.11 Knowledge of the process for controlling temporary design changes. (CFR: 41.10 / 43.3 / 45.13)			3.3	96
	2.2.12	2.2.12 Knowledge of surveillance procedures. (CFR: 41.10 / 45.13)			4.1	97
	Subtotal				2	2
3. Radiation Control	2.3.7	2.3.7 Ability to comply with radiation work permit requirements during normal or abnormal conditions. (CFR: 41.12 / 45.10)	3.5	71		
	2.3.12	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. (CFR: 41.12 / 45.9 / 45.10)	3.2	72		
	2.3.13	2.3.13 Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc. (CFR: 41.12 / 43.4 / 45.9 / 45.10)			3.8	98

	Subtotal			2		1
4. Emergency Procedures / Plan	2.4.5	2.4.5 Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions. (CFR: 41.10 / 43.5 / 45.13)	3.7	73		
	2.4.20	2.4.20 Knowledge of the operational implications of EOP warnings, cautions, and notes. (CFR: 41.10 / 43.5 / 45.13)	3.8	74		
	2.4.37	2.4.37 Knowledge of the lines of authority during implementation of the emergency plan. (CFR: 41.10 / 45.13)	3.0	75		
	2.4.16	2.4.16 Knowledge of EOP implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, and severe accident management guidelines. (CFR: 41.10 / 43.5 / 45.13)			4.4	99
	2.4.30	2.4.30 Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator. (CFR: 41.10 / 43.5 / 45.11)			4.1	100
	Subtotal			3		2
Tier 3 Point Total				10		7

Written Exam Sample Plan Only

ES-201

Examination Outline Quality Checklist

Form ES-201-2

Facility:		Date of Examination:		
Item	Task Description	Initials		
		a	b*	c#
1. W R I T T E N	a. Verify that the outline(s) fit(s) the appropriate model, in accordance with ES-401.	CB	N/A	
	b. Assess whether the outline was systematically and randomly prepared in accordance with Section D.1 of ES-401 and whether all K/A categories are appropriately sampled.	CB	N/A	
	c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics.	CB	N/A	
	d. Assess whether the justifications for deselected or rejected K/A statements are appropriate.	CB	N/A	
2. S I M U L A T O R	a. Using Form ES-301-5, verify that the proposed scenario sets cover the required number of normal evolutions, instrument and component failures, technical specifications, and major transients.	 	 	
	b. Assess whether there are enough scenario sets (and spares) to test the projected number and mix of applicants in accordance with the expected crew composition and rotation schedule without compromising exam integrity, and ensure that each applicant can be tested using at least one new or significantly modified scenario, that no scenarios are duplicated from the applicants' audit test(s), and that scenarios will not be repeated on subsequent days.			
	c. To the extent possible, assess whether the outline(s) conform(s) with the qualitative and quantitative criteria specified on Form ES-301-4 and described in Appendix D.			
3. W / T	a. Verify that the systems walk-through outline meets the criteria specified on Form ES-301-2: (1) the outline(s) contain(s) the required number of control room and in-plant tasks distributed among the safety functions as specified on the form (2) task repetition from the last two NRC examinations is within the limits specified on the form (3) no tasks are duplicated from the applicants' audit test(s) (4) the number of new or modified tasks meets or exceeds the minimums specified on the form (5) the number of alternate path, low-power, emergency, and RCA tasks meet the criteria on the form.	 	 	
	b. Verify that the administrative outline meets the criteria specified on Form ES-301-1: (1) the tasks are distributed among the topics as specified on the form (2) at least one task is new or significantly modified (3) no more than one task is repeated from the last two NRC licensing examinations			
	c. Determine if there are enough different outlines to test the projected number and mix of applicants and ensure that no items are duplicated on subsequent days.			
4. G E N E R A L	a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam sections.	CB	N/A	
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.	CB	N/A	
	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.	CB	N/A	
	d. Check for duplication and overlap among exam sections.	N/A	N/A	N/A
	e. Check the entire exam for balance of coverage.	CB	N/A	
	f. Assess whether the exam fits the appropriate job level (RO or SRO).	CB	N/A	
a. Author	Printed Name/Signature <u>Daniel M. Bacon / Daniel M. Bacon</u>		Date <u>10/24/2011</u>	
b. Facility Reviewer (*)	<u>N/A</u>			
c. NRC Chief Examiner (#)	_____			
d. NRC Supervisor	_____			
Note:	# Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required. * Not applicable for NRC-prepared examination outlines			

Facility: Surry Power Station		Date of Examination: <u>8/2012</u>
Examination Level: RO		Operating Test Number: <u>1</u>
Administrative Topic (see Note)	Type Code*	Describe activity to be performed (KA)
Conduct of Operations	R / M	Perform an At-Power Shutdown Margin with a Partially Dropped Control Rod G2.1.25 Ability to Interpret Reference Materials, Such as Graphs, Curves, Tables, etc. (3.9/4.2)
Conduct of Operations	R / D	Determine Final Pressure for a Waste Gas Decay Tank G2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and <i>instrument interpretation</i> . (4.4/4.7)
Radiation Control	R / M	Calculate Dose and Best Work Method 2.3.7 Ability to comply with radiation work permit requirements during normal or abnormal conditions. (3.5/3.6)
Emergency Plan	S / D	Transmit Report of Emergency to State and Local Governments. 2.4.39 (Knowledge of RO responsibilities in emergency plan implementation (3.9)
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		
* Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≥ 3 for ROs; $\geq \infty$ for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≥ 1 ; randomly selected)		

Facility: Surry Power Station		Date of Examination: <u>8/2012</u>
Examination Level: SRO		Operating Test Number: <u>1</u>
Administrative Topic (see Note)	Type Code*	Describe activity to be performed (KA)
Conduct of Operations	R / M	Perform an At-Power Shutdown Margin with a Partially Dropped Control Rod G2.1.25 Ability to Interpret Reference Materials, Such as Graphs, Curves, Tables, etc. (3.9/4.2)
Conduct of Operations	R / M	Determine Final Pressure for a Waste Gas Decay Tank and determine T.S. time limitations G2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and <i>instrument interpretation</i> . (4.4/4.7)
Equipment Control	R / N	Perform a SRO Review of a Surveillance Procedure and Determine Tech Spec Applicability 2.2.12 Knowledge of surveillance procedures (4.1)
Radiation Control	R / M	Calculate Dose and Best Work Method 2.3.7 Ability to comply with radiation work permit requirements during normal or abnormal conditions. (3.5/3.6)
Emergency Plan	R / M	SRO – Classify SAE SRO-2.4.41 (Knowledge of the emergency action level thresholds and classifications) (4.6)
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		
* Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; $\leq \infty$ for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1 ; randomly selected)		

Facility: Surry Power Station		Date of Examination: 08/2012	
Exam Level: RO - <u>X</u> SRO-I SRO-U		Operating Test No.: 1	
Control Room Systems [@] (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)			
System / JPM Title	Type Code*	Safety Function	
a. Swap to Th Recirc	A/S/N/L/EN	2	
b. Perform 1-FR-H.3 for SG High Level	A/S/N/L	4	
c. Place the Containment H2 Analyzer in Service	S/D/L	5	
d. Perform AP-3.00 to Emergency Borate the RCS	A/S/N	1	
e. Place the AAC Diesel on the 1J Emergency Bus	S/D/L	6	
f. Adjust the PRNIs in accordance with 1-OPT-RX-001	A/S/N	7	
g. Isolate a Leaking Recirc Spray Heat Exchanger	S/M/L	9	
h. Respond to a Spurious SI <350°F	S/D/L	3	
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)			
i. Isolate Flooding in #5 MER	A/D/E	4	
j. Align Turbine Building IA to Containment	D/R	8	
k. Locally Isolate the Secondary System (E-3, Attachment 1)	E/D	3	
@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.			
* Type Codes	Criteria for RO		
	RO	Actual	Criteria Met?
(A)lternate path	4-6	5	Yes
(D)irect from bank	≤ 9	6	Yes
(E)mergency or abnormal in-plant	≥ 1	2	Yes
(EN)gineered safety feature			
(L)ow-Power / Shutdown	≥ 1	6	Yes
(N)ew or (M)odified from bank including 1(A)	≥ 2	5	Yes
(P)revious 2 exams (randomly selected)	≤ 3	0	Yes
(R)CA	≥ 1	1	Yes
(S)imulator / (C)ontrol room			

Facility: Surry Power Station Exam Level: RO SRO-I - <input checked="" type="checkbox"/> SRO-U		Date of Examination: 08/2012 Operating Test No.: 1	
Control Room Systems [@] (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)			
System / JPM Title	Type Code*	Safety Function	
a. Swap to Th Recirc	A/S/N/L/EN	2	
b. Perform 1-FR-H.3 for SG High Level	A/S/N/L	4	
c. Place the Containment H2 Analyzer in Service	S/D/L	5	
d. Perform AP-3.00 to Emergency Borate the RCS	A/S/N	1	
e. Adjust the PRNIs in accordance with 1-OPT-RX-001	A/S/N	7	
f. Isolate a Leaking Recirc Spray Heat Exchanger	S/M/L	9	
g. Respond to a Spurious SI <350°F	S/D/L	3	
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)			
i. Isolate Flooding in #5 MER	A/D/E	4	
j. Align Turbine Building IA to Containment	D/R	8	
k. Locally Isolate the Secondary System (E-3, Attachment 1)	E/D	3	
@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.			
* Type Codes	Criteria for SRO-I		
	SRO-I	Actual	Criteria Met?
(A)lternate path	4-6	5	Yes
(D)irect from bank	≤ 8	5	Yes
(E)mergency or abnormal in-plant	≥ 1	2	Yes
(EN)gineered safety feature			
(L)ow-Power / Shutdown	≥ 1	5	Yes
(N)ew or (M)odified from bank including 1(A)	≥ 2	5	Yes
(P)revious 2 exams (randomly selected)	≤ 3	0	Yes
(R)CA	≥ 1	1	Yes
(S)imulator / (C)ontrol room			

Facility: Surry Power Station	Date of Examination: 08/2012
Exam Level: RO SRO-I SRO-U- <u>X</u>	Operating Test No.: 1

Control Room Systems[@] (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

System / JPM Title	Type Code*	Safety Function
a. Swap to Th Recirc	A/S/N/L/EN	2
b. Isolate a Leaking Recirc Spray Heat Exchanger	S/M/L	9
c. Respond to a Spurious SI <350°F	S/D/L	3
d.		
e.		
f.		
g.		
h.		

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

i. Isolate Flooding in #5 MER	A/D/E	4
j. Align Turbine Building IA to Containment	D/R	8
k.		

[@] All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for SRO-U		
	SRO-U	Actual	Criteria Met?
(A)lternate path	2-3	2	Yes
(D)irect from bank	≤ 4	3	Yes
(E)mergency or abnormal in-plant	≥ 1	1	Yes
(EN)gineered safety feature	≥ 1	1	Yes
(L)ow-Power / Shutdown	≥ 1	3	Yes
(N)ew or (M)odified from bank including 1(A)	≥ 1	2	Yes
(P)revious 2 exams (randomly selected)	≤ 2	0	Yes
(R)CA	≥ 1	1	Yes
(S)imulator / (C)ontrol room			