


Facility: Palisades														Date of Exam: October 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	2	3	3	N/A			3	4	N/A			3	18	3	3	6					
	2	1	2	2				2	1				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	2	2	2	4	3	28	3	2	5					
2		1	0	1	1	1	1	1	1	1	1	1	10		1	2	3					
Tier Totals		4	2	4	4	3	3	3	3	3	5	4	38	4	4	8						
3. Generic Knowledge and Abilities Categories					1		2		3		4		10	1		2		3		4		7
					3		3		2		2			2		2		1		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	
		Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO)							
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						X	G2.4.50 - Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	4.2	1
000008 Pressurizer Vapor Space Accident / 3	X						AK1.01 - Knowledge of the operational implications of thermodynamics and flow characteristics of open or leaking valves.	3.2	1
000009 Small Break LOCA / 3		X					EK2.03 - Knowledge of the interrelations between the small break LOCA and S/Gs.	3.0	1
000011 Large Break LOCA / 3			X				EK3.14 - Knowledge of the reasons for RCP tripping requirement.	4.1	1
000015/17 RCP Malfunctions / 4				X			AA1.23 - Ability to operate and / or monitor RCP vibration.	3.1	1
000022 Loss of Rx Coolant Makeup / 2					X		AA2.01 - Ability to determine and interpret whether charging line leak exists.	3.2	1
000025 Loss of RHR System / 4						X	G2.4.11 - Knowledge of abnormal condition procedures.	4.0	1
000026 Loss of Component Cooling Water / 8			X				AK3.02 - Knowledge of the reasons for the automatic actions (alignments) within the CCWS resulting from the actuation of the ESFAS.	3.6	1
000029 ATWS / 1		X					EK2.06 - Knowledge of the interrelations between the ATWS and breakers, relays, and disconnects.	2.9	1
000038 Steam Gen. Tube Rupture / 3	X						EK1.01 - Knowledge of the operational implications of the use of steam tables.	3.1	1
000054 (CE/E06) Loss of Main Feedwater / 4				X			EA1.3 - Ability to operate and / or monitor desired operating results during abnormal and emergency situations.	3.2	1
000055 Station Blackout / 6					X		EA2.03 - Ability to determine and/or interpret actions necessary to restore power.	3.9	1
000056 Loss of Off-site Power / 6						X	G2.1.23 - Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.3	1
000057 Loss of Vital AC Inst. Bus / 6					X		AA2.04 - Ability to determine and interpret ESF system panel alarm annunciators and channel status indicators.	3.7	1
000058 Loss of DC Power / 6			X				AK3.02 - Knowledge of the reasons for actions contained in EOP for loss of dc power.	4.0	1
000062 Loss of Nuclear Svc Water / 4				X			AA1.02 - Ability to operate and / or monitor loads on the SWS in the control room.	3.2	1
000065 Loss of Instrument Air / 8					X		AA2.03 - Ability to determine and interpret location and isolation of leaks.	2.6	1
000077 Generator Voltage and Electric Grid Disturbances / 6		X					AK2.07 - Knowledge of the interrelations with Turbine/generator control.	3.6	1
K/A Category Totals:	2	3	3	3	4	3	Group Point Total:		18

ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO)						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	#
000024 Emergency Boration / 1		X					AK2.01 - Knowledge of the interrelations between emergency boration and valves.	2.7	1
000036 (BW/A08) Fuel Handling Accident / 8			X				AK3.03 - Knowledge of the reasons for the guidance contained in EOP for fuel handling incident.	3.7	1
000037 Steam Generator Tube Leak / 3				X			AA1.11 - Ability to operate and / or monitor PZR level indicator.	3.4	1
000051 Loss of Condenser Vacuum / 4					X		AA2.02 - Ability to determine and interpret conditions requiring reactor and/or turbine trip.	3.9	1
000061 ARM System Alarms / 7						X	G2.4.46 - Ability to verify that the alarms are consistent with the plant conditions.	4.2	1
000068 (BW/A06) Control Room Evac. / 8		X					AK2.01 - Knowledge of the interrelations between the control room evacuation and the auxiliary shutdown panel layout.	3.9	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4	X						AK1.2 - Knowledge of the operational implications of normal, abnormal and emergency operating procedures.	3.2	1
CE/A11; W/E08 RCS Overcooling - PTS / 4			X				AK3.3 - Knowledge of the reasons for manipulation of controls required to obtain desired operating results during abnormal and emergency situations.	3.1	1
CE/A16 Excess RCS Leakage / 2				X			AA1.1 - Ability to operate and / or monitor components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.4	1
K/A Category Point Totals:	1	2	2	2	1	1	Group Point Total:		9

PWR Examination Outline Plant Systems - Tier 2/Group 1 (RO)												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										X		A4.04 - Ability to manually operate and/or monitor RCP seal differential pressure instrumentation.	3.1	1
004 Chemical and Volume Control											X	G2.4.31 - Knowledge of annunciator alarms, indications, or response procedures.	4.2	2
	X											K1.24 - Knowledge of the physical connections and/or cause-effect relationships with RHRS.	3.4	
005 Residual Heat Removal		X										K2.03 - Knowledge of bus power supplies to RCS pressure boundary motor-operated valves.	2.7	1
006 Emergency Core Cooling			X									K3.01 - Knowledge of the effect that a loss or malfunction will have on the RCS.	4.1	1
007 Pressurizer Relief/Quench Tank				X								K4.01 - Knowledge of PRTS design feature(s) and/or interlock(s) which provide for quench tank cooling.	2.6	1
008 Component Cooling Water							X					A1.01 - Ability to predict and/or monitor changes in CCW flow rate.	2.8	2
								X				A2.03 - Ability to predict the impacts of high/low CCW temperature and use procedures to correct, control, or mitigate the consequences.	3.0	
010 Pressurizer Pressure Control					X							K5.01 - Knowledge of the operational implications of determination of condition of fluid in PZR, using steam tables.	3.5	1
012 Reactor Protection						X						K6.06 - Knowledge of the effect of a loss or malfunction of sensors and detectors.	2.7	2
									X			A3.06 - Ability to monitor automatic operation of trip logic.	3.7	
013 Engineered Safety Features Actuation										X		A4.02 - Ability to manually operate and/or monitor reset of ESFAS channels.	4.3	1
022 Containment Cooling											X	G2.4.49 - Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.6	2
	X											K1.01 - Knowledge of the physical connections and/or cause-effect relationship with SWS/cooling system.	3.5	
026 Containment Spray		X										K2.01 - Knowledge of bus power supplies to containment spray pumps.	3.4	1
039 Main and Reheat Steam			X									K3.06 - Knowledge of the effect that a loss or malfunction will have on the SDS.	2.8	2
				X								K4.05 - Knowledge of MRSS design feature(s) and/or interlock(s) which provide automatic isolation of steam line.	3.7	

PWR Examination Outline Plant Systems - Tier 2/Group 1 (RO) - cont'd												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	#
059 Main Feedwater										X		A4.03 - Ability to manually operate and/or monitor feedwater control during power increase and decrease.	2.9	1
061 Auxiliary/Emergency Feedwater						X						K6.02 - Knowledge of the effect of a loss or malfunction of pumps.	2.6	1
062 AC Electrical Distribution							X					A1.01 - Ability to predict and/or monitor changes in significance of D/G load limits.	3.4	1
063 DC Electrical Distribution								X				A2.01 - Ability to predict the impacts of grounds and use procedures to correct, control, or mitigate the consequences.	2.5	1
064 Emergency Diesel Generator									X			A3.06 - Ability to monitor automatic operation of start and stop.	3.3	1
073 Process Radiation Monitoring					X							K5.02 - Knowledge of the operational implications of radiation intensity changes with source distance.	2.5	1
076 Service Water										X		A4.02 - Ability to manually operate and/or monitor SWS valves.	2.6	2
											X	G2.2.44 - 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	
078 Instrument Air	X											K1.04 - Knowledge of the physical connections and/or cause-effect relationships between the IAS and cooling water to compressor.	2.6	2
			X									K3.02 - Knowledge of the effect that a loss or malfunction of the IAS will have on systems containing pneumatic valves and controls.	3.4	
103 Containment				X								K4.06 - Knowledge of containment system design feature(s) and/or interlock(s) which provide for containment isolation system.	3.1	1
K/A Category Point Totals:	3	2	3	3	2	2	2	2	2	4	3	Group Point Total:	28	

PWR Examination Outline Plant Systems - Tier 2/Group 2 (RO)												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							K5.88 - Knowledge of the operational implications of the effects of boron on temperature coefficient.	2.9	1
002 Reactor Coolant						X						K6.02 - Knowledge of the effect of a loss or malfunction of a RCP.	3.6	1
011 Pressurizer Level Control							X					A1.04 - Ability to predict and/or monitor changes in Tave.	3.1	1
015 Nuclear Instrumentation								X				A2.01 - Ability to predict the impacts of power supply loss or erratic operation and use procedures to correct, control, or mitigate the consequences.	3.5	1
017 In-core Temperature Monitor									X			A4.01 - Ability to manually operate and/or monitor in the control room: Actual in-core temperatures.	3.8	1
029 Containment Purge				X								K4.03 - Knowledge of design feature(s) and/or interlock(s) which provide for automatic purge isolation.	3.2	1
041 Steam Dump/Turbine Bypass Control										X		G2.1.28 - Knowledge of the purpose and function of major system components and controls.	4.1	1
045 Main Turbine Generator	X											K1.18 - Knowledge of the physical connections and/or cause-effect relationships between the MT/G system and RPS.	3.6	1
071 Waste Gas Disposal			X									K3.05 - Knowledge of the effect that a loss or malfunction of the Waste Gas Disposal System will have on ARM and PRM systems.	3.2	1
086 Fire Protection								X				A3.02 - Ability to monitor automatic operation of the actuation of the FPS.	2.9	1
K/A Category Point Totals:	1	0	1	1	1	1	1	1	1	1	1	Group Point Total:		10

ES-401 PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (SRO)					
E/APE # / Name / Safety Function	A 2	G	K/A Topic(s)	IR	#
000011 Large Break LOCA / 3	X		EA2.03 - Ability to determine or interpret consequences of managing LOCA with loss of CCW.	4.2	1
000025 Loss of RHR System / 4		X	G2.4.46 - Ability to verify that the alarms are consistent with the plant conditions.	4.2	1
000027 Pressurizer Pressure Control System Malfunctions / 3	X		AA2.06 - Ability to determine and interpret conditions requiring plant shutdown.	3.9	1
000040 (BW/E05; CE/E05 ; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4		X	G2.4.30 - 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.	4.1	1
000054 (CE/E06) Loss of Main Feedwater / 4	X		EA2.2 - Ability to determine and interpret adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.	4.2	1
000057 Loss of Vital AC Inst. Bus / 6		X	G2.2.44 - 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.	4.4	1
K/A Category Totals:	3	3	Group Point Total:		6

ES-401 PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (SRO)					
E/APE # / Name / Safety Function		A	G	K/A Topic(s)	IR #
000005 Inoperable/Stuck Control Rod / 1		X		AA2.03 - Ability to determine and interpret required actions if more than one rod is stuck or inoperable.	4.4 1
000033 Loss of Intermediate Range NI / 7			X	G2.2.40 - Ability to apply technical specifications for a system.	4.7 1
000074 (W/E06&E07) Inad. Core Cooling / 4		X		EA2.06 - Ability to determine or interpret changes in PZR level due to PZR steam bubble transfer to the RCS.	4.6 1
CE/E09 Functional Recovery			X	G2.4.41 - Knowledge of the emergency action level thresholds and classifications.	4.6 1
K/A Category Point Totals:		2	2	Group Point Total:	4

ES-401		PWR Examination Outline Plant Systems - Tier 2/Group 1 (SRO)			Form ES-401-2	
System # / Name	A 2	G	K/A Topic(s)	IR	#	
003 Reactor Coolant Pump	X		A2.01 - Ability to predict the impacts of problems with RCP seals, especially rates of seal leak-off and use procedures to correct, control, or mitigate the consequences.	3.9	1	
026 Containment Spray		X	G2.2.37 - Ability to determine operability and/or availability of safety related equipment.	4.6	1	
039 Main and Reheat Steam System (MRSS)	X		A2.04 - Ability to predict the impacts of a malfunctioning steam dump and use procedures to correct, control, or mitigate the consequences.	3.7	1	
061 Auxiliary/Emergency Feedwater		X	G2.4.6 - Knowledge of EOP mitigation strategies.	4.7	1	
064 Emergency Diesel Generator	X		A2.02 - Ability to predict the impacts of Load, VARS, pressure on air compressor, speed droop, frequency, voltage, fuel oil level, temperatures and use procedures to correct, control, or mitigate the consequences.	2.9	1	
K/A Category Point Totals:	3	2	Group Point Total:		5	

ES-401		PWR Examination Outline Plant Systems - Tier 2/Group 2 (SRO)				Form ES-401-2
System # / Name	A 2	G	K/A Topic(s)	IR	#	
014 Rod Position Indication		X	G2.2.22 - Knowledge of limiting conditions for operations and safety limits.	4.7	1	
016 Non-nuclear Instrumentation	X		A2.02 - Ability to predict the impacts of loss of power supply and use procedures to correct, control, or mitigate the consequences.	3.2	1	
033 Spent Fuel Pool Cooling		X	G2.4.45 - Ability to prioritize and interpret the significance of each annunciator or alarm.	4.3	1	
K/A Category Point Totals:	1	2	Group Point Total:		3	

Facility: Palisades						Date of Exam: October 2012	
Category	K/A #	Topic	RO		SRO-Only		
			IR	#	IR	#	
1. Conduct of Operations	2.1.1	Knowledge of conduct of operations requirements.	3.8	1			
	2.1.8	Ability to coordinate personnel activities outside the control room.	3.4	1			
	2.1.18	Ability to make accurate, clear, and concise logs, records, status boards, and reports.	3.6	1			
	2.1.37	Knowledge of procedures, guidelines, or limitations associated with reactivity management.			4.6	1	
	2.1.42	Knowledge of new and spent fuel movement procedures.			3.4	1	
	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	1			
	2.2.42	Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	3.9	1			
	2.2.43	Knowledge of the process used to track inoperable alarms.	3.0	1			
	2.2.18	Knowledge of the process for managing maintenance activities during shutdown operations, such as risk assessments, work prioritization, etc.			3.9	1	
	2.2.23	Ability to track Technical Specification limiting conditions for operations.			4.6	1	
	Subtotal		3		2		
3. Radiation Control	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.	3.2	1			
	2.3.11	Ability to control radiation releases.	3.8	1			
	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.			3.8	1	
	Subtotal		2		1		
4. Emergency Procedures / Plan	2.4.4	Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.	4.5	1			
	2.4.17	Knowledge of EOP terms and definitions.	3.9	1			
	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.			4.2	1	
	2.4.44	Knowledge of emergency plan protective action recommendations.			4.4	1	
	Subtotal		2		2		
Tier 3 Point Total:				10		7	