

Facility: Indian Point Unit 3													Date of Exam: Oct/Nov 2017					
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 and Abnormal Plant Evolutions	1	4	0	3	N/A			4	3	N/A			4	18			6	
	2	0	5	0				1	1				2	9			4	
	Tier Totals	4	5	3				5	4				6	27			10	
2. Plant Systems	1	1	2	2	3	2	2	4	4	2	4	2	28			5		
	2	2	0	0	1	1	1	1	3	0	1	0	10			3		
	Tier Totals	3	2	2	4	3	3	5	7	2	5	2	38			8		
3. Generic Knowledge and Abilities Categories					1		2		3		4		10	1	2	3	4	7
					2		3		2		3							

- 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 outline sections (i.e., except for one category in Tier 3 of the SRO-only section, the "Tier Totals" in each K/A category shall not be less than two). (One Tier 3 radiation control K/A is allowed if it is replaced by a K/A from another Tier 3 category.)
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  $\pm 1$  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 outline. Systems or evolutions that do not apply at the facility should be deleted with justification. 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' 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 a category 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.

G\* Generic K/As

- \* These systems/evolutions must be included as part of the sample (as applicable to the facility) when Revision 3 of the K/A catalog is used to develop the sample plan. They are not required to be included when using earlier revisions of the K/A catalog.
- \*\* These systems/evolutions may be eliminated from the sample (as applicable to the facility) when Revision 3 of the K/A catalog is used to develop the sample plan.

ES-401		PWR Examination Outline						Form ES-401-2	
Emergency and Abnormal Plant Evolutions—Tier 1/Group 1 (RO/SRO)									
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	#
000007 (EPE 7; BW E02&E10; CE E02) Reactor Trip, Stabilization, Recovery / 1						X	2.4.21 – Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.	4.0	1
000008 (APE 8) Pressurizer Vapor Space Accident / 3					X		AA2.18 – Computer indications for RCS temperature and pressure	3.0	2
000009 (EPE 9) Small Break LOCA / 3			X				EK3.27 – Manual depressurization or HPI recirculation for sustained high pressure	3.6	3
000011 (EPE 11) Large Break LOCA / 3				X			EA1.03 – Securing of RCPs	4.0	4
000015 (APE 15) Reactor Coolant Pump Malfunctions / 4				X			AA1.22 – RCP seal failure/malfunction	4.0	5
000022 (APE 22) Loss of Reactor Coolant Makeup / 2	X						AK1.03 – Relationship between charging flow and PZR level	3.0	6
000025 (APE 25) Loss of Residual Heat Removal System / 4						X	2.2.22 – Knowledge of limiting conditions for operations and safety limits.	4.0	7
000026 (APE 26) Loss of Component Cooling Water / 8							N/A – Not randomly selected		
000027 (APE 27) Pressurizer Pressure Control System Malfunction / 3							N/A – Not randomly selected		
000029 (EPE 29) Anticipated Transient Without Scram / 1							N/A – Not randomly selected		
000038 (EPE 38) Steam Generator Tube Rupture / 3			X				EK3.06 – Actions contained in EOP for RCS water inventory balance, S/G tube rupture, and plant shutdown procedures	4.2	8
000040 (APE 40; BW E05; CE E05; W E12) Steam Line Rupture—Excessive Heat Transfer / 4	X						AK1.07 – Effects of feedwater introduction on dry S/G	3.4	9
000040 (APE 40; BW E05; CE E05; W E12) Steam Line Rupture—Excessive Heat Transfer / 4				X			AA1.10 AFW System	4.1	9
000054 (APE 54; CE E06) Loss of Main Feedwater / 4	X						AK1.01- MFW line break depressurizes the S/G (similar to a steam line break)	4.1	10
000055 (EPE 55) Station Blackout / 6					X		EA2.02 – RCS core cooling through natural circulation cooling to S/G cooling	4.4	11
000056 (APE 56) Loss of Offsite Power / 6	X						AK1.03 – Definition of subcooling: use of steam tables to determine it	3.1*	12
000057 (APE 57) Loss of Vital AC Instrument Bus / 6			X				AK3.01 – Actions contained in EOP for loss of vital ac electrical instrument bus	4.1	13
000057 (APE 57) Loss of Vital AC Instrument Bus / 6				X			AA1.03 Feedwater pump speed to control pressure and level in S/G	3.6	13
000058 (APE 58) Loss of DC Power / 6	X						AK1.01 – Battery charger equipment and instrumentation	2.8	14
000062 (APE 62) Loss of Nuclear Service Water / 4					X		AA2.02 – The cause of possible SWS loss	2.9	15
000065 (APE 65) Loss of Instrument Air / 8						X	2.4.2 – Knowledge of system setpoints, interlocks and automatic actions associated with EOP entry conditions	4.5	16

000077 (APE 77) Generator Voltage and Electric Grid Disturbances / 6							N/A – Not randomly selected		
(W E04) LOCA Outside Containment / 3							N/A – Not randomly selected		
(W E11) Loss of Emergency Coolant Recirculation / 4			X				EK3.3 – Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations	3.8	17
(BW E04; W E05) Inadequate Heat Transfer—Loss of Secondary Heat Sink / 4						X	2.1.19 – Ability to use plant computers to evaluate system or component status	3.9	18
K/A Category Totals:	5	0	4	2	3	4	Group Point Total:		18

ES-401		PWR Examination Outline							Form ES-401-2	
Emergency and Abnormal Plant Evolutions—Tier 1/Group 2 (RO/SRO)										
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	#	
000001 (APE 1) Continuous Rod Withdrawal / 1							N/A – Not randomly selected			
000003 (APE 3) Dropped Control Rod / 1							N/A – Not randomly selected			
000005 (APE 5) Inoperable/Stuck Control Rod / 1				X			AA1.04 – Reactor and turbine power	3.9	19	
000024 (APE 24) Emergency Boration / 1							N/A – Not randomly selected			
000028 (APE 28) Pressurizer (PZR) Level Control Malfunction / 2							N/A – Not randomly selected			
000032 (APE 32) Loss of Source Range Nuclear Instrumentation / 7							N/A – Not randomly selected			
000033 (APE 33) Loss of Intermediate Range Nuclear Instrumentation / 7					X		AA2.08 – Intermediate range channel operability	3.3	20	
000036 (APE 36; BW/A08) Fuel-Handling Incidents / 8							N/A – Not randomly selected			
000037 (APE 37) Steam Generator Tube Leak / 3							N/A – Not randomly selected			
000051 (APE 51) Loss of Condenser Vacuum / 4							N/A – Not randomly selected			
000059 (APE 59) Accidental Liquid Radwaste Release / 9							N/A – Not randomly selected			
000060 (APE 60) Accidental Gaseous Radwaste Release / 9		X					AK2.01 – ARM system, including the normal radiation-level indications and the operability status	2.6	21	
000061 (APE 61) Area Radiation Monitoring System Alarms / 7							N/A – Not randomly selected			
000067 (APE 67) Plant Fire On Site / 8						X	2.2.39 – Knowledge of less than or equal to one hour Technical Specification action statements for systems.	3.9	22	
000068 (APE 68; BW A06) Control Room Evacuation / 8							N/A – Not randomly selected			
000069 (APE 69; W E14) Loss of Containment Integrity / 5		X					AK2.03 – Personnel access hatch and emergency access hatch	2.8*	23	
000074 (EPE 74; W E06 & E07) Inadequate Core Cooling / 4							N/A – Not randomly selected			
000076 (APE 76) High Reactor Coolant Activity / 9		X					AK2.01 – Process radiation monitors	2.6	24	
000078 (APE 78*) RCS Leak / 3							N/A – Not randomly selected			
(W E01 & E02) Rediagnosis & SI Termination / 3							N/A – Not randomly selected			
(W E13) Steam Generator Overpressure / 4		X					EK2.2 – Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility	3.0	25	
(W E15) Containment Flooding / 5						X	2.1.20 – Ability to interpret and execute procedure steps	4.6	26	
(W E16) High Containment Radiation / 9		X					EK2.2 - Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility	2.6	27	
(BW A01) Plant Runback / 1							N/A – Not randomly selected			
(BW A02 & A03) Loss of NNI-X/Y/7							N/A – Not randomly selected			
(BW A04) Turbine Trip / 4							N/A – Not randomly selected			
(BW A05) Emergency Diesel Actuation / 6							N/A – Not randomly selected			
(BW A07) Flooding / 8							N/A – Not randomly selected			
(BW E03) Inadequate Subcooling Margin / 4							N/A – Not randomly selected			

(BW E08; W E03) LOCA Cooldown—Depressurization / 4							N/A – Not randomly selected		
(BW E09; CE A13**; W E09 & E10) Natural Circulation/4							N/A – Not randomly selected		
(BW E13 & E14) EOP Rules and Enclosures							N/A – Not randomly selected		
(CE A11**; W E08) RCS Overcooling—Pressurized Thermal Shock / 4							N/A – Not randomly selected		
(CE A16) Excess RCS Leakage / 2							N/A – Not randomly selected		
(CE E09) Functional Recovery							N/A – Not randomly selected		
(CE E13*) Loss of Forced Circulation/LOOP/Blackout / 4							N/A – Not randomly selected		
K/A Category Point Totals:	0	5	0	1	1	2	Group Point Total:		9

ES-401		PWR Examination Outline Plant Systems—Tier 2/Group 1 (RO/SRO)											Form ES-401-2	
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	#
003 (SF4P RCP) Reactor Coolant Pump						X						K6.04 - Containment isolation valves affecting RCP operation	2.8	28
004 (SF1; SF2 CVCS) Chemical and Volume Control						X						K6.37 - Boron Loading of demineralizer resin	2.9	29
004 (SF1; SF2 CVCS) Chemical and Volume Control										X		A4.04 - Calculation of boron concentration changes	3.2	30
005 (SF4P RHR) Residual Heat Removal			X									K3.06 - Knowledge of the effect that a loss or malfunction of the RHRS will have on the following: CSS	3.1*	31
005 (SF4P RHR) Residual Heat Removal								X				A2.02 - Pressure transient protection during cold shutdown	3.5	32
006 (SF2; SF3 ECCS) Emergency Core Cooling							X					A1.11 - Boron Concentration	3.1	33
006 (SF2; SF3 ECCS) Emergency Core Cooling											X	2.2.25 - Knowledge of bases in Technical Specifications for limiting conditions for operations and safety limits	3.2	34
007 (SF5 PRTS) Pressurizer Relief/Quench Tank							X					A1.02 - Maintaining quench tank pressure	2.7	35
008 (SF8 CCW) Component Cooling Water								X				A2.01 - Loss of CCW pump	3.3	36
010 (SF3 PZR PCS) Pressurizer Pressure Control							X					A1.06 - RCS heatup and cooldown effect on pressure	3.1	37
012 (SF7 RPS) Reactor Protection							X					A1.01 - Trip setpoint adjustment	2.9*	38
013 (SF2 ESFAS) Engineered Safety Features Actuation										X		A4.02 - Reset of ESFAS channels	4.3	39
022 (SF5 CCS) Containment Cooling				X								K4.02 - Correlation of fan speed and flowpath changes with containment pressure	3.1*	40
025 (SF5 ICE) Ice Condenser												N/A - Not randomly selected, not applicable to Indian Point Unit 3		
026 (SF5 CSS) Containment Spray										X		A4.01 - CSS controls	4.5	41
026 (SF5 CSS) Containment Spray											X	2.4.6 - Knowledge of EOP mitigation strategies	3.7	42
039 (SF4S MSS) Main and Reheat Steam					X							K5.05 - Bases for RCS cooldown limits	2.7	43
059 (SF4S MFW) Main Feedwater			X									K3.04 - Knowledge of the effect that a loss or malfunction of the MFW will have on the following: RCS	3.6	44
061 (SF4S AFW) Auxiliary/Emergency Feedwater					X							K5.02 - Decay heat sources and magnitude	3.2	45
062 (SF6 ED AC) AC Electrical Distribution				X								K4.06 - One-line diagram of 6.9KV distribution, including sources of normal and alternate power	2.9*	46
062 (SF6 ED AC) AC Electrical Distribution								X				A2.07 - Consequences of opening a disconnect under load	3.0*	47
062 (SF6 ED AC) AC Electrical Distribution								X				A2.16 Degraded System Voltages	2.5	47

063 (SF6 ED DC) DC Electrical Distribution		X												K2.01 – Knowledge of bus power supplies to the following: Major DC loads	2.9*	48
063 (SF6 ED DC) DC Electrical Distribution										X				A4.03 – Battery discharge rate	3.0*	49
064 (SF6 EDG) Emergency Diesel Generator				X										K4.02 – Trips for ED/G while operating (normal or emergency)	3.9	50
073 (SF7 PRM) Process Radiation Monitoring	X													K1.01 – Those systems served by PRMs	3.6	51
076 (SF4S SW) Service Water										X				A3.02 – Emergency heat loads	3.7	52
078 (SF8 IAS) Instrument Air		X												K2.02 – Knowledge of bus power supplies to the following: Emergency air compressor	3.3*	53
078 (SF8 IAS) Instrument Air		X												K2.01 – Knowledge of bus power supplies to the following: Instrument Air Compressor	2.7	53
103 (SF5 CNT) Containment									X					A2.03 – Phase A and B isolation	3.5*	54
103 (SF5 CNT) Containment										X				A3.01 – Containment isolation	3.9	55
053 (SF1; SF4P ICS*) Integrated Control														N/A for NUREG 1122, Rev. 2		
K/A Category Point Totals:	1	2	2	3	2	2	4	4	2	4	2	Group Point Total:				28

ES-401		PWR Examination Outline											Form ES-401-2	
Plant Systems—Tier 2/Group 2 (RO/SRO)														
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	#
001 (SF1 CRDS) Control Rod Drive						X						K6.02 – Purpose and operation of sensors feeding into the CRDS	2.8	56
002 (SF2; SF4P RCS) Reactor Coolant	X											K1.01 – Knowledge of the physical connections and/or cause-effect relationships between the RCS and the following systems: RWST	3.7	57
011 (SF2 PZR LCS) Pressurizer Level Control	X											K1.01 - Knowledge of the physical connections and/or cause-effect relationships between the PZR LCS and the following systems: CVCS	3.6	58
014 (SF1 RPI) Rod Position Indication												N/A – Not randomly selected		
015 (SF7 NI) Nuclear Instrumentation												N/A – Not randomly selected		
016 (SF7 NNI) Nonnuclear Instrumentation												N/A – Not randomly selected		
017 (SF7 ITM) In-Core Temperature Monitor					X							K5.02 – Knowledge of the operational implications of the following concepts as they apply to the ITM system: Saturation and subcooling of water	3.7	59
027 (SF5 CIRS) Containment Iodine Removal								X				A2.01 – High temperature in the filter system	3.0*	60
028 (SF5 HRPS) Hydrogen Recombiner and Purge Control												N/A – Not randomly selected		
029 (SF8 CPS) Containment Purge												N/A – Not randomly selected		
033 (SF8 SFPCS) Spent Fuel Pool Cooling								X				A2.02 – Loss of SFPCS	2.7	61
034 (SF8 FHS) Fuel-Handling Equipment				X								K4.01 – Fuel protection from binding and dropping	2.6	62
035 (SF 4P SG) Steam Generator												N/A – Not randomly selected		
041 (SF4S SDS) Steam Dump/Turbine Bypass Control										X		A4.02 – Cooldown valves	2.7*	63
045 (SF 4S MTG) Main Turbine Generator												N/A – Not randomly selected		
055 (SF4S CARS) Condenser Air Removal												N/A – Not randomly selected		
056 (SF4S CDS) Condensate												N/A – Not randomly selected		
068 (SF9 LRS) Liquid Radwaste												N/A – Not randomly selected		
071 (SF9 WGS) Waste Gas Disposal												N/A – Not randomly selected		
072 (SF7 ARM) Area Radiation Monitoring							X					A1.01 – Radiation Levels	3.4	64
075 (SF8 CW) Circulating Water								X				A2.03 – Safety features and relationship between condenser vacuum, turbine trip, and steam dump	2.5	65
079 (SF8 SAS**) Station Air												N/A – Not randomly selected		
086 Fire Protection												N/A – Not randomly selected		
050 (SF 9 CRV*) Control Room Ventilation												N/A for NUREG 1122, Rev. 2		
K/A Category Point Totals:	2	0	0	1	1	1	1	3	0	1	0	Group Point Total:		10



Facility: Indian Point Unit 3

Date of Exam: Oct/Nov 2017

Category	K/A #	Topic	RO	
			IR	#
1. Conduct of Operations	2.1.26	Knowledge of industrial safety procedures (such as rotating equipment, electrical, high temperature, high pressure, caustic, chlorine, oxygen and hydrogen).	3.4	66
	2.1.44	Knowledge of the 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 refueling operations, and supporting instrumentation.	3.9	67
	Subtotal			2
2. Equipment Control	2.2.6	Knowledge of the process fro making changes to procedures.	3.0	68
	2.2.18	Knowledge of the process for managing maintenance activities during shutdown operations, such as risk assessments, work prioritization, etc.	2.6	69
	2.2.43	Knowledge of the process used to track inoperable alarms.	3.0	70
	Subtotal			3
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	71
	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.	3.4	72
	Subtotal			2
4. Emergency Procedures/Plan	2.4.14	Knowledge of general guidelines for EOP usage.	3.8	73
	2.4.35	Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects.	3.8	74
	2.4.42	Knowledge of emergency response facilities.	2.6	75
	Subtotal			3
Tier 3 Point Total				10

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	2												9	2		2	4	
	Tier Totals													27	5		5	10
2. Plant Systems	1												28	2		3	5	
	2												10	2		1	3	
	Tier Totals												38	4		4	8	
3. Generic Knowledge and Abilities Categories				1		2		3		4		10		1	2	3	4	7
										2	2			1	2			

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000007 (EPE 7; BW E02&E10; CE E02) Reactor Trip, Stabilization, Recovery / 1							N/A – Not randomly selected		
000008 (APE 8) Pressurizer Vapor Space Accident / 3							N/A – Not randomly selected		
000009 (EPE 9) Small Break LOCA / 3							N/A – Not randomly selected		
000011 (EPE 11) Large Break LOCA / 3							N/A – Not randomly selected		
000015 (APE 15) Reactor Coolant Pump Malfunctions / 4							N/A – Not randomly selected		
000022 (APE 22) Loss of Reactor Coolant Makeup / 2							N/A – Not randomly selected		
000025 (APE 25) Loss of Residual Heat Removal System / 4							N/A – Not randomly selected		
000026 (APE 26) Loss of Component Cooling Water / 8						X	2.4.46 – Ability to verify that alarms are consistent with the plant conditions	4.2	1
000027 (APE 27) Pressurizer Pressure Control System Malfunction / 3					X		AA2.11 – RCS Pressure	4.1	2
000029 (EPE 29) Anticipated Transient Without Scram / 1					X		EA2.02 – Reactor Trip Alarm	4.4	3
000038 (EPE 38) Steam Generator Tube Rupture / 3							N/A – Not randomly selected		
000040 (APE 40; BW E05; CE E05; W E12) Steam Line Rupture—Excessive Heat Transfer / 4							N/A – Not randomly selected		
000054 (APE 54; CE E06) Loss of Main Feedwater / 4							N/A – Not randomly selected		
000055 (EPE 55) Station Blackout / 6							N/A – Not randomly selected		
000056 (APE 56) Loss of Offsite Power / 6							N/A – Not randomly selected		
000057 (APE 57) Loss of Vital AC Instrument Bus / 6						X	2.4.20 – Knowledge of the operational implications of EOP warnings, cautions, and notes.	4.3	4
000058 (APE 58) Loss of DC Power / 6							N/A – Not randomly selected		
000062 (APE 62) Loss of Nuclear Service Water / 4							N/A – Not randomly selected		
000065 (APE 65) Loss of Instrument Air / 8							N/A – Not randomly selected		
000077 (APE 77) Generator Voltage and Electric Grid Disturbances / 6					X		AA2.01 – Operating point on the generator capability curve	3.6	5
(W E04) LOCA Outside Containment / 3						X	2.4.8 – Knowledge of how abnormal operating procedures are used in conjunction with EOPs.	4.5	6
(W E11) Loss of Emergency Coolant Recirculation / 4							N/A – Not randomly selected		
(BW E04; W E05) Inadequate Heat Transfer—Loss of Secondary Heat Sink / 4							N/A – Not randomly selected		
K/A Category Totals:	0	0	0	0	3	3	Group Point Total:		6

ES-401		PWR Examination Outline						Form ES-401-2		
Emergency and Abnormal Plant Evolutions—Tier 1/Group 2 (RO/SRO)										
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	#	
000001 (APE 1) Continuous Rod Withdrawal / 1						X	2.4.1—Knowledge of EOP entry conditions and immediate action steps	4.8	7	
000003 (APE 3) Dropped Control Rod / 1							2.1.07 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.7	7	
000005 (APE 5) Inoperable/Stuck Control Rod / 1							N/A – Not randomly selected			
000024 (APE 24) Emergency Boration / 1							N/A – Not randomly selected			
000028 (APE 28) Pressurizer (PZR) Level Control Malfunction / 2							N/A – Not randomly selected			
000032 (APE 32) Loss of Source Range Nuclear Instrumentation / 7							N/A – Not randomly selected			
000033 (APE 33) Loss of Intermediate Range Nuclear Instrumentation / 7							N/A – Not randomly selected			
000036 (APE 36; BW/A08) Fuel-Handling Incidents / 8							N/A – Not randomly selected			
000037 (APE 37) Steam Generator Tube Leak / 3							N/A – Not randomly selected			
000051 (APE 51) Loss of Condenser Vacuum / 4					X		AA2.02 – Conditions requiring reactor and/or turbine trip	4.1	8	
000059 (APE 59) Accidental Liquid Radwaste Release / 9							N/A – Not randomly selected			
000060 (APE 60) Accidental Gaseous Radwaste Release / 9							N/A – Not randomly selected			
000061 (APE 61) Area Radiation Monitoring System Alarms / 7							N/A – Not randomly selected			
000067 (APE 67) Plant Fire On Site / 8							N/A – Not randomly selected			
000068 (APE 68; BW A06) Control Room Evacuation / 8							N/A – Not randomly selected			
000069 (APE 69; W E14) Loss of Containment Integrity / 5							N/A – Not randomly selected			
000074 (EPE 74; W E06 & E07) Inadequate Core Cooling / 4							N/A – Not randomly selected			
000076 (APE 76) High Reactor Coolant Activity / 9							N/A – Not randomly selected			
000078 (APE 78*) RCS Leak / 3							N/A – Not randomly selected			
(W E01 & E02) Rediagnosis & SI Termination / 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	4.4	9	
(W E13) Steam Generator Overpressure / 4							N/A – Not randomly selected			
(W E15) Containment Flooding / 5							N/A – Not randomly selected			
(W E16) High Containment Radiation /9							N/A – Not randomly selected			
(BW A01) Plant Runback / 1							N/A – Not randomly selected			
(BW A02 & A03) Loss of NNI-X/Y/7							N/A – Not randomly selected			
(BW A04) Turbine Trip / 4							N/A – Not randomly selected			
(BW A05) Emergency Diesel Actuation / 6							N/A – Not randomly selected			
(BW A07) Flooding / 8							N/A – Not randomly selected			
(BW E03) Inadequate Subcooling Margin / 4							N/A – Not randomly selected			
(BW E08; <b>W E03</b> ) LOCA Cutdown—Depressurization / 4					X		EA2.1 – Facility conditions and selection of appropriate procedures during abnormal and emergency operations	4.2	10	
(BW E09; CE A13**; W E09 & E10) Natural Circulation/4							N/A – Not randomly selected			
(BW E13 & E14) EOP Rules and Enclosures							N/A – Not randomly selected			

(CE A11**; W E08) RCS Overcooling—Pressurized Thermal Shock / 4							N/A – Not randomly selected		
(CE A16) Excess RCS Leakage / 2							N/A – Not randomly selected		
(CE E09) Functional Recovery							N/A – Not randomly selected		
(CE E13*) Loss of Forced Circulation/LOOP/Blackout / 4							N/A – Not randomly selected		
K/A Category Point Totals:	0	0	0	0	2	2	Group Point Total:		4

PWR Examination Outline Plant Systems—Tier 2/Group 1 (RO/SRO)															Form ES-401-2	
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	#		
003 (SF4P RCP) Reactor Coolant Pump											X	2.1.32 – Ability to explain and apply system limits and precautions.	4.0	11		
004 (SF1; SF2 CVCS) Chemical and Volume Control												N/A – Not randomly selected				
005 (SF4P RHR) Residual Heat Removal												N/A – Not randomly selected				
006 (SF2; SF3 ECCS) Emergency Core Cooling												N/A – Not randomly selected				
007 (SF5 PRTS) Pressurizer Relief/Quench Tank												N/A – Not randomly selected				
008 (SF8 CCW) Component Cooling Water											X	2.4.50 – Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	4.0	12		
010 (SF3 PZR PCS) Pressurizer Pressure Control												N/A – Not randomly selected				
012 (SF7 RPS) Reactor Protection												N/A – Not randomly selected				
013 (SF2 ESFAS) Engineered Safety Features Actuation												N/A – Not randomly selected				
022 (SF5 CCS) Containment Cooling								X				A2.04 – Loss of service water	3.2	13		
025 (SF5 ICE) Ice Condenser												N/A – Not randomly selected				
026 (SF5 CSS) Containment Spray												N/A – Not randomly selected				
039 (SF4S MSS) Main and Reheat Steam												N/A – Not randomly selected				
059 (SF4S MFW) Main Feedwater												N/A – Not randomly selected				
061 (SF4S AFW) Auxiliary/Emergency Feedwater												N/A – Not randomly selected				
062 (SF6 ED AC) AC Electrical Distribution												N/A – Not randomly selected				
063 (SF6 ED DC) DC Electrical Distribution												N/A – Not randomly selected				
064 (SF6 EDG) Emergency Diesel Generator												N/A – Not randomly selected				
073 (SF7 PRM) Process Radiation Monitoring											X	2.1.23 – Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.4	14		
076 (SF4S SW) Service Water												N/A – Not randomly selected				
078 (SF8 IAS) Instrument Air								X				A2.01 – Air dryer and filter malfunctions	2.9	15		
103 (SF5 CNT) Containment												N/A – Not randomly selected				
053 (SF1; SF4P ICS*) Integrated Control												N/A for NUREG 1122, Rev. 2				
K/A Category Point Totals:	0	0	0	0	0	0	0	2	0	0	3	Group Point Total:	5			

ES-401		PWR Examination Outline												Form ES-401-2	
Plant Systems—Tier 2/Group 2 (RO/SRO)															
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	#	
001 (SF1 CRDS) Control Rod Drive												N/A – Not randomly selected			
002 (SF2; SF4P RCS) Reactor Coolant												N/A – Not randomly selected			
011 (SF2 PZR LCS) Pressurizer Level Control												N/A – Not randomly selected			
014 (SF1 RPI) Rod Position Indication												N/A – Not randomly selected			
015 (SF7 NI) 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	16	
016 (SF7 NNI) Nonnuclear Instrumentation												N/A – Not randomly selected			
017 (SF7 ITM) In-Core Temperature Monitor												N/A – Not randomly selected			
027 (SF5 CIRS) Containment Iodine Removal												N/A – Not randomly selected			
028 (SF5 HRPS) Hydrogen Recombiner and Purge Control												N/A – Not randomly selected			
029 (SF8 CPS) Containment Purge												N/A – Not randomly selected			
033 (SF8 SFPCS) Spent Fuel Pool Cooling												N/A – Not randomly selected			
034 (SF8 FHS) Fuel-Handling Equipment												N/A – Not randomly selected			
035 (SF 4P SG) Steam Generator											X	2.4.4 – Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.	4.7	17	
041 (SF4S SDS) Steam Dump/Turbine Bypass Control												N/A – Not randomly selected			
045 (SF 4S MTG) Main Turbine Generator												N/A – Not randomly selected			
055 (SF4S CARS) Condenser Air Removal												N/A – Not randomly selected			
056 (SF4S CDS) Condensate												N/A – Not randomly selected			
068 (SF9 LRS) Liquid Radwaste								X				A2.04 – Failure of automatic isolation	3.3	18	
071 (SF9 WGS) Waste Gas Disposal												N/A – Not randomly selected			
072 (SF7 ARM) Area Radiation Monitoring												N/A – Not randomly selected			
075 (SF8 CW) Circulating Water												N/A – Not randomly selected			
079 (SF8 SAS**) Station Air												N/A – Not randomly selected			
086 Fire Protection												N/A – Not randomly selected			
050 (SF 9 CRV*) Control Room Ventilation												N/A for NUREG 1122, Rev. 2			
												N/A – Not randomly selected			
K/A Category Point Totals:	0	0	0	0	0	0	0	2	0	0	1	Group Point Total:		3	

**ES-401****Generic Knowledge and Abilities Outline (Tier 3)****Form ES-401-3**

Facility: Indian Point Unit 3

Date of Exam: Oct/Nov 2017

Category	K/A #	Topic	SRO	
			IR	#
1. Conduct of Operations	2.1.37	Knowledge of procedures, guidelines, or limitations associated with reactivity management.	4.6	19
	2.1.42	Knowledge of new and spent fuel movement procedures.	3.4	20
	Subtotal			2
2. Equipment Control	2.2.19	Knowledge of maintenance work order requirements.	3.4	21
	2.2.40	Ability to apply Technical Specifications for a system.	4.7	22
	Subtotal			2
3. Radiation Control	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.	3.8	23
	Subtotal			1
4. Emergency Procedures/Plan	2.4.26	Knowledge of facility protection requirements, including fire brigade and portable fire fighting equipment usage.	3.6	24
	2.4.44	Knowledge of emergency plan protective action recommendations.	4.4	25
	Subtotal			2
Tier 3 Point Total				7



