Facility: Indian Point 2		Date of Exam: 10/22/2004											Exam Level: RO
Tier	Group	K/A Category Point											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	3	3	4				2	3			3	18
	2	2	2	2				1	1			1	9
	Tier Totals	5	5	6				3	4			4	27
2. Plant Systems	1	4	3	6	1	2	2	2	2	1	4	1	28
	2	0	0	0	2	2	0	2	1	1	0	2	10
	Tier Totals	4	3	6	3	4	2	4	3	2	4	3	38
3. Generic Knowledge and Abilities		1			2			3			4		10
		3			2			2			3		

Note:
1. Ensure that at least two topics from every K/A category are sampled within each tier of the RO outline (i.e., the "Tier Totals" in each K/A category shall not be less than two). Refer to Section D.1.c for additional guidance regarding SRO sampling.
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 exam must total 75 points and the SRO-only exam must total 25 points.
3. Select topics from many systems; avoid selecting more than two K/A topics from a given system unless they relate to plant-specific priorities.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category/tier.
6.* 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. The SRO K/As must also be linked to 10 CFR 55.43 or an SRO-level learning objective.
7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) 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; summarize all the SRO-only knowledge and non-A2 ability categories in the columns labeled "K" and "A." Use duplicate pages for RO and SRO-only exams.
8. For Tier 3, enter the K/A numbers, descriptions, importance ratings, and point totals on form ES-401-3.
9. Refer to ES-401, Attachment 2, for guidance regarding the elimination of inappropriate K/A statements.

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	IR RO	Q#
000007 (BW/E02 & E10; CE/E02) / Reactor Trip – Stabilization – Recovery / 1								Not Selected		
000008 / Pressurizer Vapor Space Accident / 3			R				AK3.03	Knowledge of the reasons for actions contained in EOP for PZR vapor space accident/LOCA	4.1	
000009 / Small Break LOCA / 3					R		EA2.34	Ability to determine or interpret conditions for throttling or stopping HPI as they apply to a small break LOCA	3.6	
000011 / Large Break LOCA / 3		R					EK2.02	Knowledge of the interrelations between pumps and a Large Break LOCA	2.6	
000015/17 RCP Malfunctions / 4			R				AK3.02	Knowledge of the reasons for responses of CCW lineup and flow paths to RCP oil coolers during RCP malfunctions	3.0	
000022 / Loss of Reactor Coolant Makeup / 2	R						AK1.02	Knowledge of the operational implications of the relationship of charging flow to pressure differential between charging and RCS as they apply to Loss of Reactor Coolant Pump	2.7	
000025 / Loss of RHR System / 4	R						AK1.01	Knowledge of the operational implications of a loss of RHRS during all modes of operations	3.9	
000026 / Loss of Component Cooling Water / 8				R			AA1.07	Ability to operate and/or monitor flow rates to the components and systems that are serviced by the CCWS; interactions among the components	2.9	
000027 / Pressurizer Pressure Control System Malfunction / 3					R		AA2.15	Ability to determine and interpret the actions to be taken if PZR pressure instrument fails high	3.7	
000029 / Anticipated Transient w/o Scram / 1		R					EK2.06	Knowledge of the interrelations between the breakers, relays, and disconnects following an ATWS	2.9	
000038 / Steam Generator Tube Rupture / 3				R			EA1.11	Ability to operate and monitor SG level indicators as they apply to a SGTR	3.8	
000040 (BW/E05; CE/E05; W/E12) / Steam Line Rupture – Excessive Heat Transfer / 4								Not selected		
000054 (CE/E06) / Loss of Main Feedwater / 4						R	G2.4.2	Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions	3.9	
000055 / Station Blackout / 6			R				EK3.02	Knowledge of the reasons for the actions contained in EOP for loss of offsite and onsite power	4.3	
000056 / Loss of Off-site Power / 6						R	G2.1.20	Ability to execute procedure steps	4.3	
000057 / Loss of Vital AC Elec. Inst. Bus / 6			R				AK3.01	Knowledge of the reasons for the following responses as they apply to the Loss of Vital AC Instrument Bus Actions contained in EOP for loss of vital AC electrical instrument bus	4.1	
000058 / Loss of DC Power / 6					R		AA2.03	Ability to determine and interpret DC loads lost; impact on ability to operate and monitor plant systems as they apply to the loss of DC Power	3.5	
000062 / Loss of Nuclear Service Water / 4								Not Selected		

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	IR RO	Q#
000065 / Loss of Instrument Air / 8						R	G2.1.2	Knowledge of operator responsibilities during all modes of plant operation.	3.0	
W/E04 / LOCA Outside Containment / 3		R					EK2.1	Knowledge of the interrelations between the (LOCA Outside Containment and the components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.5	
W/E11 / Loss of Emergency Coolant Recirc. / 4								Not Selected		
BW/E04; W/E05 / Inadequate Heat Transfer – Loss of Secondary Heat Sink / 4	R						EK1.2	Knowledge of the operational implications of normal, abnormal and emergency operating procedures associated with the (Loss of Secondary Heat Sink)	3.9	
K/A Category Point Totals:	3	3	4	2	3	3		Group Point Total:		18

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	IR RO	Q#
000001 / Continuous Rod Withdrawal / 1								Not Selected		
000003 / Dropped Control Rod / 1								Not Selected		
00005 Inoperable/Stuck Control Rod / 1								Not Selected		
000024 Emergency Boration / 1								Not Selected		
000028 / Pressurizer Level Malfunction / 2		R					AK2.02	Knowledge of the interrelations between the Pressurizer Level Control Malfunctions and sensors and detectors	2.6	
000032 / Loss of Source Range NI / 7		R					AK2.01	Knowledge of the interrelations between the Loss of Source Range Nuclear Instrumentation and the power supplies, including proper switch positions	2.7	
000033 / Loss of Intermediate Range NI / 7								Not Selected		
000036 (BW/A08) / Fuel Handling Accident / 8								Not Selected		
000037 / Steam Generator Tube Leak / 3	R						AK1.02	Knowledge of the operational implications of the leak rate vs. pressure drop concept as it applies to a Steam Generator Tube Leak	3.5	
000051 / Loss of Condenser Vacuum / 4								Not Selected		
000059 / Accidental Liquid Radwaste Rel. / 9			R				AK3.01	Knowledge of the reasons for the termination of a release of radioactive liquid as it applies to the Accidental Liquid Radwaste Release	3.5	
000060 / Accidental Gaseous Radwaste Rel. / 9								Not Selected		
000061 / ARM System Alarms / 7								Not Selected		
000067 / Plant Fire On-site / 9								Not Selected		
000068 (BW/A06) / Control Room Evac. / 8				R			AA1.03	Ability to operate and / or monitor the S/G levels as they apply to the Control Room Evacuation	4.1	
000069 (W/E14) / Loss of CTMT Integrity / 5								Not Selected		
000074 (W/E06 & E07) / Inad. Core Cooling / 4						R	G2.4.18	Knowledge of the specific bases for EOPs	2.7	
000076 / High Reactor Coolant Activity / 9								Not Selected		
WE/01 & 02 / Rediagnosis & SI Termination / 3								Not Selected		
W/E13 / Steam Generator Over-pressure / 4								Not Selected		
W/E15 / Containment Flooding / 5	R						W/E15 EK1.2	Knowledge of the operational implications of the normal, abnormal and emergency operating procedures associated with Containment flooding	2.7	
W/E16 / High Containment Radiation / 9					R		W/E16 EA2.2	Ability to determine and interpret adherence to appropriate procedures and operation within the limitations in the facility's license and amendments as they apply to High containment Radiation	3.0	
BW/A01 / Plant Runback / 1								Not Selected		
BW/A02 & A03 / Loss of NNI-X/Y / 7								Not Selected		

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

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	IR RO	Q#
BW/A04 / Turbine Trip / 4								Not Selected		
BW/A05 / Emergency Diesel Actuation / 6								Not Selected		
BW/A07 / Flooding / 8								Not Selected		
BW/E03 / Inadequate Subcooling Margin / 4								Not Selected		
BW/E08; W/E03 / LOCA Cooldown / Depress. / 4			R				W/E03. EK3.2	Knowledge of the reason for normal, abnormal and emergency operating procedures associated with (LOCA Cooldown and Depressurization).	3.4	
BW/E09; CE/A13; W/E09 & 10 Natural Circ./ 4								Not Selected		
BW/E13 & E14 / EOP Rules and Enclosures								Not Selected		
CE/A11; W/E08 / RCS Overcooling – PTS / 4								Not Selected		
CE/A16 / Excess RCS Leakage / 2								Not Selected		
CE/E09 / Functional Recovery								Not Selected		
K/A Category Point Totals:	2	2	2	1	1	1		Group Point Total:		9

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic(s)	IR RO	Q#
003 Reactor Coolant Pump					R							K5.05	Knowledge of the operational implications of the dependency of RCS flow rates upon the number of operating RCPs	2.8	
003 Reactor Coolant Pump							R					A1.10	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCPs controls including RCP standpipe levels	2.5	
004 Chemical and Volume Control			R									K3.08	Knowledge of the effect that a loss or malfunction of the CVCS will have on RCP Seal Injection	3.6	
004 Chemical and Volume Control										R		A4.15	Ability to manually operate and/or monitor in the control room Boron concentration	3.6	
005 Residual Heat Removal		R										K2.03	Knowledge of the bus power supplies to the RCS pressure boundary motor-operated valves	2.7	
006 Emergency Core Cooling			R									K3.02	Knowledge of the effect that a loss or malfunction of the ECCS will have on the fuel	4.3	
006 Emergency Core Cooling						R						K6.18	Knowledge of the effect that a loss or malfunction of the ECCS will have on Subcooling Margin Indicators	3.5	
007 Pressurizer Relief/Quench Tank							R					A1.01	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with maintaining quench tank water level within limits	2.9	
008 Component Cooling Water	R											K1.03	Knowledge of the physical connections and / or cause-effect relationships between the CCWS PRMS	2.8	
010 Pressurizer Pressure Control									R			A3.02	Ability to monitor automatic operation of PZR PCS, including: PZR pressure.	3.6	
010 Pressurizer Pressure Control						R						K6.01	Knowledge of the effect that a loss or malfunction of the pressure detection systems will have on the PZR PCS	2.7	
012 Reactor Protection	R											K1.02	Knowledge of the physical connections and / or cause-effect relationships between the RPS and the 125VDC System	3.4	
013 Engineered Safety Features Actuation		R										K2.01	Knowledge of bus power supplies to the ESFAS/safeguards equipment	3.6	
022 Containment Cooling										R		A4.04	Ability to manually operate and/or monitor in the Control Room: Valves in the CCS.	3.1	

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic(s)	IR RO	Q#
025 Ice Condenser													N/A		
026 Containment Spray				R								K4.06	Knowledge of the CSS design feature(s) and/or interlock(s) which provide for Iodine scavenging via the CSS	2.8	
039 Main and Reheat Steam								R				A2.05	Ability to (a) predict the impacts of Increasing steam demand, its relationship to increases in reactor power operation on the MRSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations	3.3	
056 Condensate								R				A2.04	Ability to (a) predict the impacts of loss of condensate pumps, Condensate System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations	2.6	
059 Main Feedwater			R									K3.04	Knowledge of the effect that a loss or malfunction of the MFW will have of the RCS	3.6	
061 Auxiliary / Emergency Feedwater					R							K5.01	Knowledge of the operational implications of the relationship between AFW flow and RCS heat transfer	3.6	
062 AC Electrical Distribution		R										K2.01	Knowledge of bus power supplies to the major system loads	3.3	
063 DC Electrical Distribution			R									K3.02	Knowledge of the effect that a loss or malfunction of the DC Electrical System will have on the following: Components using dc control power.	3.5	
064 Emergency Diesel Generator											R	G2.1.28	Knowledge of the purpose and function of the major system components and controls	3.2	
064 Emergency Diesel Generator										R		A4.01	Ability to manually operate and/or monitor in the control room local and remote operation of the ED/G	4.0	
073 Process Radiation Monitoring	R											K1.01	Knowledge of the physical connections and/or cause-effect relationships between the PRM system and those systems served by PRMs	3.6	
076 Service Water										R		A4.01	Ability to manually operate and/or monitor in the control room SWS Pumps	2.9	

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic(s)	IR RO	Q#
076 Service Water	R											K1.05	Knowledge of the physical connections and/or cause-effect relationships between the SWS and the D/G	3.8	
078 Instrument Air			R									K3.02	Knowledge of the effect that a loss or malfunction of the IAS will have on systems having pneumatic valves and controls	3.4	
103 Containment									R			A3.01	Ability to monitor automatic operation of the containment systems including containment isolation	3.9	
K/A Category Point Totals:	4	3	5	1	2	2	2	2	2	4	1	Group Point Total:			28

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic(s)	IR RO	Q#
001 Control Rod Drive				R								K4.07	Knowledge of the CRDS design feature(s) and/or interlock(s) which provide for the rod stops	3.7	
002 Reactor Coolant													Not selected		
011 Pressurizer Level Control					R							K5.15	Knowledge of the operational implications of the PZR level indication when RCS is saturated	3.6	
014 Rod Position Indication							R					A1.03	Ability to predict and/or monitor changes in parameters associated with operating the RPIS controls, including PDIL, PPDIL	3.6	
015 Nuclear Instrumentation													Not selected		
016 Non-nuclear Instrumentation													Not selected		
017 In-Core Temperature Monitor								R				A2.02	Ability to (a) predict the impacts of core damage on the ITM system; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of core damage	3.6	
027 Containment Iodine Removal													Not selected		
028 Hydrogen Recombiner and Purge Control													Not selected		
029 Containment Purge													Not selected		
033 Spent Fuel Pool Cooling				R								K4.03	Knowledge of design features(s) and/or interlock(s) which provide for anti-siphon devices	2.6	
034 Fuel Handling Equipment													Not selected		
035 Steam Generator					R							K5.01	Knowledge of operational implications of the effect of secondary parameters, pressure, and temperature on reactivity	3.4	
041 Steam Dump/Turbine Bypass Control											R	G2.1.10	Knowledge of conditions and limitations in the facility license.	2.7	
045 Main Turbine Generator							R					A1.06	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MT/G system controls including expected response of secondary plant parameters following T/G trip	3.3	
055 Condenser Air Removal													Not selected		
068 Liquid Radwaste													Not selected		
071 Waste Gas Disposal													Not selected		

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic(s)	IR RO	Q#
072 Area Radiation Monitoring													Not selected		
075 Circulating Water											R	2.1.8	Ability to coordinate personnel activities outside the control room	3.8	
079 Station Air													Not selected		
086 Fire Protection									R			A3.02	Ability to monitor automatic operation of the Fire Protection System including actuation of the FPS	2.9	
K/A Category Point Totals:				2	2		2	1	1		2	Group Point Total:			10

Facility: Indian Point Unit 2		Date of Exam: 10/22/2004	RO	
Category	K/A #	Topic	IR	Q#
Conduct of Operations	2.1.29	Knowledge of how to conduct and verify valve lineups.	3.4	
	2.1.7	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	3.7	
	2.1.20	Ability to execute procedure steps.	4.3	
	Total			3
Equipment Control	2.2.33	Knowledge of control rod programming.	2.5	
	2.2.22	Knowledge of limiting conditions for operations and safety limits.	3.0	
	Total			3
Radiation Control	2.3.11	Ability to control radiation releases.	2.7	
	2.3.1	Knowledge of 10 CFR: 20 and related facility radiation control requirements.	2.6	
	Total			3
Emergency Procedures / Plan	2.4.16	Knowledge of EOP implementation hierarchy and coordination with other support procedures	3.0	
	2.4.6	Knowledge symptom based EOP mitigation strategies	3.8	
	2.4.1	Knowledge of EOP entry conditions and immediate action steps.	4.3	
	Total			3
Tier 3 Point Total RO				10

Tier / Group	Randomly Selected K/A	Reason for Rejection
2/1	010 K3	Too many K3's, Not enough K6's
2/1	103 K3	Too many K3's, Not enough A3's

Facility: Indian Point 2		Date of Exam: 10/22/2004			Exam Level: SRO								
Tier	Group	K/A Category Point											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	1	2	1					2			1	7
	2	2							1			2	5
	Tier Totals	3	2	1					3			3	12
2. Plant Systems	1				1	1			2				4
	2					1			1				2
	Tier Totals				1	2			3				6
3. Generic Knowledge and Abilities		1			2			3			4		7
		2			2			1			2		

Note:

1. Ensure that at least two topics from every K/A category are sampled within each tier of the RO outline (i.e., the "Tier Totals" in each K/A category shall not be less than two). Refer to Section D.1.c for additional guidance regarding SRO sampling.
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 exam must total 75 points and the SRO-only exam must total 25 points.
3. Select topics from many systems; avoid selecting more than two K/A topics from a given system unless they relate to plant-specific priorities.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category/tier.
6. * 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. The SRO K/As must also be linked to 10 CFR 55.43 or an SRO-level learning objective.
7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) 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; summarize all the SRO-only knowledge and non-A2 ability categories in the columns labeled "K" and "A." Use duplicate pages for RO and SRO-only exams.
8. For Tier 3, enter the K/A numbers, descriptions, importance ratings, and point totals on form ES-401-3.
9. Refer to ES-401, Attachment 2, for guidance regarding the elimination of inappropriate K/A statements.

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	IR SRO	Q#
000007 (BW/E02 & E10; CE/E02) / Reactor Trip – Stabilization – Recovery / 1										
000008 / Pressurizer Vapor Space Accident / 3										
000009 / Small Break LOCA / 3		S					EK2.03	Knowledge of the interrelations between the small break LOCA and the Steam Generators	3.3	
000011 / Large Break LOCA / 3										
000015/17 RCP Malfunctions / 4					S		AA2.02	Ability to determine and interpret abnormalities in RCP air vent flow paths and/or oil cooling system as they apply to the reactor Coolant Pump Malfunction	3.0	
000022 / Loss of Reactor Coolant Makeup / 2										
000025 / Loss of RHR System / 4										
000026 / Loss of Component Cooling Water / 8										
000027 / Pressurizer Pressure Control System Malfunction / 3										
000029 / Anticipated Transient w/o Scram / 1										
000038 / Steam Generator Tube Rupture / 3		S					EK2.02	Knowledge of the interrelations between sensors and detectors and a SGTR	2.5	
000040 (BW/E05; CE/E05; W/E12) / Steam Line Rupture – Excessive Heat Transfer / 4						S	G2.4.6	Knowledge of symptom based EOP mitigation strategies	4.0	
000054 (CE/E06) / Loss of Main Feedwater / 4	S						AK1.01	Knowledge of the operational implications of a MFW line break depressurizes the S/G concepts as they apply to Loss of Main Feedwater	4.3	
000055 / Station Blackout / 6										
000056 / Loss of Off-site Power / 6			S				AK3.02	Knowledge of the reasons for actions contained in EOP for loss of offsite power as they apply to Loss of Offsite Power	4.7	
000057 / Loss of Vital AC Elec. Inst. Bus / 6										
000058 / Loss of DC Power / 6										
000062 / Loss of Nuclear Service Water / 4										
000065 / Loss of Instrument Air / 8										
W/E04 / LOCA Outside Containment / 3										
W/E11 / Loss of Emergency Coolant Recirc. / 4					S		E11 EA2.2	Ability to determine and interpret adherence to appropriate procedures and operation within the limitations in the facility's license and amendments as they apply to Loss of Emergency Coolant Recirculation	4.2	
BW/E04; W/E05 / Inadequate Heat Transfer – Loss of Secondary Heat Sink / 4										
K/A Category Point Totals:	1	2	1		2	1		Group Point Total:		7

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	IR SRO	Q#
000001 / Continuous Rod Withdrawal / 1	S						AK1.03	Knowledge of the operational implications of the relationship of reactivity and reactor power to rod movement as they apply to Continuous Rod Withdrawal	4.0	
000003 / Dropped Control Rod / 1										
00005 Inoperable/Stuck Control Rod / 1										
000024 Emergency Boration / 1										
000028 / Pressurizer Level Malfunction / 2										
000032 / Loss of Source Range NI / 7										
000033 / Loss of Intermediate Range NI / 7										
000036 (BW/A08) / Fuel Handling Accident / 8										
000037 / Steam Generator Tube Leak / 3										
000051 / Loss of Condenser Vacuum / 4										
000059 / Accidental Liquid Radwaste Rel. / 9										
000060 / Accidental Gaseous Radwaste Rel. / 9										
000061 / ARM System Alarms / 7										
000067 / Plant Fire On-site / 9										
000068 (BW/A06) / Control Room Evac. / 8										
000069 (W/E14) / Loss of CTMT Integrity / 5						S	2.2.14	Knowledge of the process for making configuration changes	3.0	
000074 (W/E06 & E07) / Inad. Core Cooling / 4										
000076 / High Reactor Coolant Activity / 9						S	2.1.28	Knowledge of the purpose and function of major system components and controls	3.3	
WE/01 & 02 / Rediagnosis & SI Termination / 3	S						EK1.2	Knowledge of the operational implications of normal, abnormal and emergency operating procedures associated with Reactor Trip or Safety Injection / Rediagnosis	4.0	
W/E13 / Steam Generator Over-pressure / 4										
W/E15 / Containment Flooding / 5										
W/E16 / High Containment Radiation / 9										
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										

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	IR SRO	Q#
BW/E09; CE/A13; W/E09 & 10 Natural Circ./ 4					S		EA2.2	Ability to determine and interpret adherence to appropriate procedures and operation within the limitations in the facility's license and amendments as they apply to Natural Circulation Operations	3.8	
BW/E13 & E14 / EOP Rules and Enclosures										
CE/A11; W/E08 / RCS Overcooling – PTS / 4										
CE/A16 / Excess RCS Leakage / 2										
CE/E09 / Functional Recovery										
K/A Category Point Totals:	2				1	2		Group Point Total:		5

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic(s)	IR SRO	Q#
003 Reactor Coolant Pump															
004 Chemical and Volume Control					S							K5.19	Knowledge of the operational implications of the concept of SDM as it applies to the CVCS	3.9	
005 Residual Heat Removal								S				A2.03	Ability to predict the impacts of RHR pump/motor malfunctions or operations on the RHRS and based on those predictions use procedures to correct, control or mitigate the consequences of those malfunctions or operations	3.1	
006 Emergency Core Cooling															
007 Pressurizer Relief/Quench Tank															
008 Component Cooling Water								S				A2.02	Ability to predict the impacts of High/low surge tank level malfunction or operations on the CCWS and based on those predictions use procedures to correct, control or mitigate the consequences of those malfunctions or operations	3.5	
010 Pressurizer Pressure Control															
012 Reactor Protection															
013 Engineered Safety Features Actuation															
022 Containment Cooling															
025 Ice Condenser													N/A		
026 Containment Spray															
039 Main and Reheat Steam															
056 Condensate															
059 Main Feedwater															
061 Auxiliary / Emergency Feedwater															
062 AC Electrical Distribution				S								K4.01	Knowledge of AC distribution system design features and/or interlocks which provide for Bus lockouts	4.2	
063 DC Electrical Distribution															
064 Emergency Diesel Generator															
073 Process Radiation Monitoring															

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic(s)	IR SRO	Q#
076 Service Water															
078 Instrument Air															
103 Containment															
K/A Category Point Totals:				1	1			2				Group Point Total:			4

ES-401	PWR Examination Outline Plant Systems – Tier 2/Group 2 (SRO)	Form ES-401-2

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic(s)	IR SRO	Q#
001 Control Rod Drive															
002 Reactor Coolant					S							K5.07	Knowledge of the operational implications of reactivity effects of RCS boron, pressure and temperature as they apply to the RCS	3.9	
011 Pressurizer Level Control															
014 Rod Position Indication															
015 Nuclear Instrumentation															
016 Non-nuclear Instrumentation															
017 In-Core Temperature Monitor															
027 Containment Iodine Removal															
028 Hydrogen Recombiner and Purge Control															
029 Containment Purge															
033 Spent Fuel Pool Cooling															
034 Fuel Handling Equipment								S				A2.01	Ability to predict the impacts of a dropped fuel element on the Fuel Handling System and based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations	4.4	
035 Steam Generator															
041 Steam Dump/Turbine Bypass Control															
045 Main Turbine Generator															
055 Condenser Air Removal															
068 Liquid Radwaste															
071 Waste Gas Disposal															
072 Area Radiation Monitoring															
075 Circulating Water															
079 Station Air															
086 Fire Protection															
K/A Category Point Totals:					1			1				Group Point Total:			2

Facility: Indian Point Unit 2		Date of Exam: 10/22/2004		SRO
Category	K/A #	Topic	IR	Q#
Conduct of Operations	2.1.33	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications	4.0	
	2.1.6	Ability to supervise and assume a management role during plant transients and upset conditions	4.3	
	Total			2
Equipment Control	2.2.25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits	3.7	
	2.2.26	Knowledge of refueling administrative requirements	3.7	
	Total			2
Radiation Control	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized	3.1	
	Total			1
Emergency Procedures / Plan	2.4.27	Knowledge of fire in the plant procedures	3.5	
	2.4.6	Knowledge of symptom based EOP mitigation strategies	4.0	
	Total			2
Tier 3 Point Total SRO				7

Tier / Group	Randomly Selected K/A	Reason for Rejection

Facility: Indian Point 2 Exam Level (circle one): RO / SRO(I) / SRO(U)	Date of Examination: October 11, 2004 Operating Test No.: 1
Administrative Topic (see Note)	Describe activity to be performed:
Conduct of Operations	Interpretation and application of overtime guidelines
Conduct of Operations	Application of Technical Specifications, determine that tripping bistables will cause a reactor trip. (PERFORM AFTER JPM Sim-C)
Equipment Control	Conduct an emergency tagout removal
Radiation Control	Calculate and Record a Liquid Radioactive Release for #14 Liquid Waste Distillate Storage Tank
Emergency Plan	Not applicable
NOTE: All items (5 total) are required for SROs. RO applicants required only 4 items unless they are retaking only the administrative topics, when 5 are required.	

Facility: Indian Point Unit Exam Level (circle one): RO / (SRO(I)) / SRO(U)	Date of Examination: October 11, 2004 Operating Test No.: 1
Administrative Topic (see Note)	Describe activity to be performed:
Conduct of Operations	Interpretation and Application of overtime guidelines/Replace watchstander due to illness
Conduct of Operations	Apply Technical Specifications , Monitor RPS, Place a RPS Channel in the tripped condition (one channel already failed, placing second channel will cause reactor trip.) OTDT logic – Pressure channel failure and concurrent Temperature failure. (PERFORM AFTER JPM S.C)
Equipment Control	Conduct an emergency tagout removal
Radiation Control	Review and Approve a Liquid Radioactive Release
Emergency Plan	Emergency Plan Classification (following scenario) (Time critical, 15 mins)
NOTE: All items (5 total) are required for SROs. RO applicants required only 4 items unless they are retaking only the administrative topics, when 5 are required.	

Facility: Indian Point Unit 2	Date of Examination: October 11, 2004
Exam Level (circle one): RO / SRO(I) / SRO(U)	Operating Test No.: 1

Control Room Systems (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)		
System / JPM Title	Type Code*	Safety Function
a. Perform the required actions for a malfunction of rod position indicator	N, S	1
b. Align SI pump and header during LOCA with RCS *temperature <350F*	N, A, S	2
c. Perform the required action for PZR PRESSURE CHANNEL FAILURE (Control pressure manually)	D, S	3
d. Verify RCP operation as per EOP E-0, Step 9	N, A, S	4 pri
e. Start 21 and 23 ABFP from the control room and supply AFW flow to the SGs during plant shutdown	N, A, S, L	4 sec
f. Manually initiate containment spray when actuation is required	N, A, S	5
g. Energize 6.9 kv from 13.8 kv backup power	N, S	6
h. Remove an Intermediate Range Channel from service	N, S	7
In-Plant Systems (3 for RO; 3 for SRO-I; 3 or 3 for SRO-U)		
i. Manually start 21 Emergency Diesel Generator	D	6
j. Lineup alternate cooling to the SIS and RHR Pumps	D, R	8
k. Align 24 Large Gas Decay Tank for start of discharge	M, R	9
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA		

Facility: Indian Point Unit 2_ Exam Level (circle one): RO / SRO(I) / SRO(U)	Date of Examination: October 11, 2004 Operating Test No.: 1	
Control Room Systems (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)		
System / JPM Title	Type Code*	Safety Function
a. Perform the required actions for a malfunction of rod position indicator	N, S	1
b. Align SI pump and header during LOCA with RCS temperature <350F	N, A, S	2
c. Perform the required action for PZR PRESSURE CHANNEL FAILURE (Control pressure manually)	D, S	3
d. Verify RCP operation as per EOP E-0, Step 9	N, A, S	4 pri
e. Start 21 and 23 ABFP from the control room and supply AFW flow to the SGs during plant shutdown	N, A, S, L	4 sec
f. Manually initiate containment spray when actuation is required	N, A, S	5
g. Not Required		
h. Remove an Intermediate Range Channel from service	N, S	7
In-Plant Systems (3 for RO; 3 for SRO-I; 3 or 3 for SRO-U)		
i. Manually start 21 Emergency Diesel Generator	D	6
j. Lineup alternate cooling to the SIS and RHR Pumps	D, R	8
k. Align 24 Large Gas Decay Tank for start of discharge	M, R	9
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA		

Facility: Indian Point 2 Scenario No.: NRC#1 Op-Test No.: 1

Examiners: _____ Operators: _____

Initial Conditions: 3% Rated Thermal Power, MOL

Turnover: Unit 2 is at 3% power, recovering from a 7 day forced outage to repair body to bonnet leak on PRZR Spray Loop 23 Bypass Valve 524. Shift orders are to continue the startup in accordance with Pop 1.3 Plant Startup, Mode 2 to Mode 1. The previous shift completed POP 1.3 though step 4.23. The Operations Manager, Reactor Engineering and Power Marketing have authorized a rate of power increase of 200 MWe per hour to 100% RTP.

Event No.	Malf. No.	Event Type*	Event Description
1		N CRS/BOP R RO	Raise reactor power
2	XMT-RCS020A	I ALL	Pressurizer Level Channel 2 (LT-460) Fails Low (TS CRS)
3	MAL-RCS014B	C ALL	22 SG Tube Leak (5 gpm) (TS CRS)
4	MAL-RCP007C	C CRS/BOP	23 RCP High Vibration
5	MAL-ATS007B	C CRS/RO	22 Main Boiler Feed Pump Trip (Manual reactor trip required)
6	MAL-RCS014B MAL-EPS001	M ALL	SGTR with subsequent Loss of Offsite Power
7	MOC-SIS001	C CRS/BOP	21 SI Pump Fails to Auto Start

* (N)ormal (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: Indian Point 2 Scenario No.: NRC#2 Op-Test No.: 1

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 100% Rated Thermal Power, MOL. 21 EDG is out of Service. 22 Charging Pump is out of service.

Turnover: Unit 2 is at 100% Power steady state conditions 340 EFPD. 21 EDG is out of service and has been inoperable for 42 hours. Maintenance is currently performing repairs.

In addition, 22 Charging Pump was removed from service for corrective maintenance 18 hours ago. Expected return to service in 35 hours.

Event No.	Malf. No.	Event Type*	Event Description
1	RLY-DSG009	N BOP/CRS R RO	23 EDG inoperable due to 86 Lockout Relay tripped Begin TS required plant shutdown
2	MAL-EPS007D	C ALL	Loss of Bus 6A (Lose 23 CHG Pump, Starts 21 CHG Pump)
3	MOT-CVC003A	C ALL	21 Charging Pump Trips Manual Reactor Trip
4	MAL-EPS001 MAL-DSG003B	M ALL	Loss of all AC Station Aux Xfmr fails 22 EDG fails to start
5	MOC-SWS010 MOC-SWS-011	C CRS/BOP	25 SW Pump Fails to auto start following start of 22 EDG and energizing associated 480V buses

* (N)ormal (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: Indian Point 2 Scenario No.: NRC#3 Op-Test No.: 1

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 30% Rated Thermal Power, MOL

Turnover: Unit 2 is at 30% Power with power ascension to 100% is in progress following a forced outage. No equipment OOS.

Event No.	Malf. No.	Event Type*	Event Description
1		N CRS/BOP R RO	Raise reactor power
2	MAL-CRF001AY	C ALL	Stuck Control Rod (P-10)
3	XMT-SGN026A	I RO/CRS	LT 447 24 SG Controlling Level Channel fails low.
4	MAL-CCW001D	C BOP/CRS	RCP Upper Bearing Oil Cooler CCW leak
5	MAL-RCS001C	M ALL	LBLOCA
6	RLY-PPL487 RLY-PPL488	C RO	Safety Injection auto actuation failure, RO manually actuates
7	MOC-RHR001 MOC-RHR002	C ALL	Both Recirculation Pumps both fail to start

* (N)ormal (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: Indian Point 2 Scenario No.: NRC#4 Op-Test No.: 1

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 100% Rated Thermal Power, MOL. 21 EDG is out of Service. 21 Charging Pump is out of service.

Turnover: Unit 2 is at 100% Power steady state conditions 340 EFPD. 21 EDG is out of service and has been inoperable for 42 hours. Maintenance is currently performing repairs.

In addition, 22 Charging Pump was removed from service for corrective maintenance 18 hours ago. Expected return to service in 35 hours.

Event No.	Malf. No.	Event Type*	Event Description
1	MOT-CFW003A	C BOP/CRS R RO	Condensate Pump trips Reduce steam flow<Feed Flow Reduce Tave using boration and rod insertion
2	XMT-CVC019A	I ALL	VCT Level Transmitter fails low
3	MAL-SGN002B Bat FailRxTrips.bat	M ALL	Faulted Steam Generator Reactor auto and manual trips fail to actuate
4	AOV-RCS002A	C RO/CRS	PORV Fails Open. Block valve used to isolate it.

* (N)ormal (R)eactivity, (I)nstrument, (C)omponent, (M)ajor