



Entergy Nuclear Northeast
Entergy Nuclear Operations, Inc.
IPEC Training
P.O. Box 308
Buchanan, NY 10511
914-788-2604

March 22, 2005
Indian Point Unit No. 2
Docket No. 50-247
NL-05-032
IP3-TNG-05-005

Mr. Samuel J. Collins
Regional Administrator
Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pennsylvania 19406-1415

Subject: Indian Point Unit 2 Initial Licensed Operator Examination Outline

Dear Sir:

In preparation for the Indian Point Unit 2 Reactor Operator and Senior Reactor Operator initial licensing written examinations, scheduled for the week of May 1st, 2005, Entergy Nuclear Operations, Inc. (Entergy) is providing the Reactor Operator and Senior Reactor Operator Written Examination Outlines to Mr. Joseph D'Antonio of your staff. The examination outlines are being provided in accordance with the instructions in NUREG-1021, Revision 9, "Operator Licensing Examination Standards for Nuclear Power Reactors."

In accordance with 10 CFR 55.49 and the Examination Security and Integrity Considerations in Examiner Standard ES-201, Attachment 1, the attached materials should be withheld from public disclosure until after the examinations are complete.

Entergy is making no commitments in this letter. Should you have any questions regarding this matter, please contact Mr. Robert Christman, Superintendent, Operations Training at (914) 788-2904, Mr. Stephen Joubert, Supervisor, Operations Training, at (914) 788-2973, or Mr. Robert Heidecker, Senior Instructor at (914) 788-2055.

Sincerely,

A handwritten signature in black ink, appearing to read "LPC" with a flourish.

Lou Cortopassi
Manager, Training
Indian Point Energy Center

Enclosures:

Form ES-401-2, "PWR Examination Outline" – RO
Form ES-401-2, "PWR Examination Outline" – SRO
Form ES-201-2, "Examination Outline Quality Checklist"

cc:

Document Control Desk w/o Enclosures
U.S. Nuclear Regulatory Commission
Mail Stop O-P1-17
Washington, DC 20555-0001

Mr. Richard J. Conte w/o Enclosures
Chief, Operational Safety Branch
Division of Reactor Safety
Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pennsylvania 19406-1415

Mr. Joseph D'Antonio with Enclosures
Regional Examiner
Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pennsylvania 19406-1415

Resident Inspector's Office w/o Enclosure
Indian Point Unit 3
U.S. Nuclear Regulatory Commission
P.O. Box 337
Buchanan, N.Y. 10511-0337

Facility:		Date of Exam:																
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	2	3				4	4				2	18	4	2	6	
	2	2	1	2	N/A			1	2	N/A			1	9	2	2	4	
	Tier Totals	5	3	5				5	6				3	27	6	4	10	
2. Plant Systems	1	2	2	4	4	3	1	2	3	3	3	1		28	3	2	5	
	2	1	1	0	0	1	2	0	1	2	0	2		10	2	1	3	
	Tier Totals	3	3	4	4	4	3	2	4	5	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 that are not included on the outline should be added. Refer to ES-401, Attachment 2, 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.
- 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. 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.

ES-401

INDIAN POINT UNIT 2
PWR Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1/Group 1 (RO)

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	Imp. RO	Q#
000007 (BW/E02 & E10; CE/E02) / Reactor Trip – Stabilization – Recovery / 1			R				EK3.01	Actions contained in the EOP for Reactor Trip	4.0	1(72)
000008 / Pressurizer Vapor Space Accident / 3	R						AK1.02	Changes in Leak rate with changes in pressure	3.1	2(3)
000009 / Small Break LOCA / 3						R	2.4.35	Knowledge of local auxiliary operator tasks during emergency operations including system geography and operational implications	3.3	3(73)
000011 / Large Break LOCA / 3			R				EK3.10	PTS limits on RCS Pressure and Temperature	3.7	4(71)
000015/17 RCP Malfunctions / 4					R		AA2.08	When secure RCP on high bearing temperature	3.4	5(56)
000022 / Loss of Reactor Coolant Makeup / 2					R		AA2.01	Whether a charging line leak exists	3.2	6(26)
000025 / Loss of RHR System / 4								Not Selected		
000026 / Loss of Component Cooling Water / 8								Not Selected		
000027 / Pressurizer Pressure Control System Malfunction / 3	R						AK1.01	Definition of Saturation Temperature	3.1	7(33)
000029 / Anticipated Transient w/o Scram / 1	R						EK1.03	Effects of boron on reactivity	3.6	8(70)
000038 / Steam Generator Tube Rupture / 3				R			EA1.10	Control Room radiation monitoring indications and alarms	3.7	9(69)
000040 (BW/E05; CE/E05; W/E12) / Steam Line Rupture – Excessive Heat Transfer / 4				R			EA1.2	Operating behavior characteristics of the facility	3.6	10(68)
000054 (CE/E06) / Loss of Main Feedwater / 4					R		AA2.05	Status of MFW pumps, feed regulating valves and stop valves	3.5	11(25)
000055 / Station Blackout / 6			R				EK3.02	Actions contained in the EOP for loss of on-site and off-site power	4.3	12(67)
000056 / Loss of Off-site Power / 6				R			AA1.10	Auxiliary feedwater pump (motor driven)	4.3	13(19)
000057 / Loss of Vital AC Elec. Inst. Bus / 6					R		AA2.07	Valve indication for suction from the RWST	3.3	14(55)
000058 / Loss of DC Power / 6						R	2.4.32	Loss of annunciators due to loss of DC Bus	3.3	15(24)
000062 / Loss of Nuclear Service Water / 4								Not Selected		
000065 / Loss of Instrument Air / 8				R			AA1.04	Emergency Air Compressors	3.5	16(23)
W/E04 / LOCA Outside Containment / 3								Not Selected		
W/E11 / Loss of Emergency Coolant Recirc. / 4		R					EK2.2	Facility heat removal, including primary coolant, emergency coolant, decay heat removal systems, and the proper operation of these systems to the proper operation of the facility.	3.9	17(66)
BW/E04; W/E05 / Inadequate Heat Transfer – Loss of Secondary Heat Sink / 4		R					EK2.1	Components and function of control and safety function, including instrumentation signals, interlocks, failure modes, and automatic and manual features.	3.7	18(65)
K/A Category Point Totals:	3	2	3	4	4	2		Group Point Total:		18

ES-401

INDIAN POINT UNIT 2
PWR Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1/Group 2 (RO)

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	Imp.	Q#
000001 / Continuous Rod Withdrawal / 1								Not Selected		
000003 / Dropped Control Rod / 1								Not Selected		
000005 Inoperable/Stuck Control Rod / 1								Not Selected		
000024 Emergency Boration / 1								Not Selected		
000028 / Pressurizer Level Malfunction / 2								Not Selected		
000032 / Loss of Source Range NI / 7								Not Selected		
000033 / Loss of Intermediate Range NI / 7								Not Selected		
000036 (BW/A08) / Fuel Handling Accident / 8								Not Selected		
000037 / Steam Generator Tube Leak / 3								Not Selected		
000051 / Loss of Condenser Vacuum / 4								Not Selected		
000059 / Accidental Liquid Radwaste Rel. / 9								Not Selected		
000060 / Accidental Gaseous Radwaste Rel. / 9	R						AK1.04	Calculation of Off-Site Doses due to releases from nuclear power plants.	2.5	19(46)
000061 / ARM System Alarms / 7								Not Selected		
000067 / Plant Fire On-site / 9					R		AA2.13	Need for emergency plant shutdown.	3.3	20(52)
000068 (BW/A06) / Control Room Evac. / 8			R				AK3.18	Actions contained in EOPs for control room evacuation for emergency task.	4.2	21(53)
000069 (W/E14) / Loss of CTMT Integrity / 5								Not Selected		
000074 (W/E06 & E07) / Inad. Core Cooling / 4				R			EA1.21	Condensate storage tank level gage	3.7	22(64)
000076 / High Reactor Coolant Activity / 9			R				AK3.06	Actions contained in the EOP for high RCS activity.	3.2	23(45)
WE/01 & 02 / Rediagnosis & SI Termination / 3		R					EK2.1	Components and function of control and safety function, including instrumentation signals, interlocks, failure modes, and automatic and manual features.	3.3	24(63)
W/E13 / Steam Generator Over-pressure / 4								Not Selected		
W/E15 / Containment Flooding / 5					R		EA2.2	Adherence to appropriate procedures and operation in adherence with facility license and amendments	2.9	25(61)
W/E16 / High Containment Radiation / 9						R	2.4.7	Knowledge of event based EOP mitigation strategies.	3.1	26(62)
BW/A01 / Plant Runback / 1								Not Selected		
BW/A02 & A03 / Loss of NNI-X/Y / 7								Not Selected		
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		

ES-401

INDIAN POINT UNIT 2
PWR Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1/Group 2 (RO)

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	Imp.	Q#
BW/E08; W/E03 / LOCA Cooldown / Depress. / 4	R						EK1.3	Annunciators conditions and indicating signals, and remedial actions associated with post loca cooldown and depressurization.	3.5	27(75)
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	1	2	1	2	1		Group Point Total:		9

ES-401

INDIAN POINT UNIT 2
PWR Examination Outline
Plant Systems – Tier 2/Group 1 (RO)

Form ES-401-2

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic(s)	Imp.	Q#
003 Reactor Coolant Pump						R						K6.04	Knowledge of the loss or a malfunction of the following will have on RCPs: containment isolation valves effecting RCP operation.	2.8	28(13)
003 Reactor Coolant Pump			R									K3.04	Knowledge the effects a loss or malfunction of the RCPs will have on the Reactor Protection System.	3.9	29(44)
004 Chemical and Volume Control	R											K1.16	Knowledge of physical connections and/or cause effect relationship between the CVCS system and the boric acid storage tanks.	3.3	30(29)
005 Residual Heat Removal					R							K5.03	Knowledge of the operational implications of the following concepts as they apply to RHR operation: Reactivity effects of rhr fill water.	2.9	31(28)
006 Emergency Core Cooling											R	2.4.9	Knowledge of low power/ shutdown implications in accident (eg LOCA or Loss of RHR) mitigation strategies.	3.3	32(54)
007 Pressurizer Relief/Quench Tank				R								K4.01	Knowledge of PTRS design features and/or interlock which provide for: quench tank cooling.	2.6	33(51)
008 Component Cooling Water								R				A2.04	Ability to (a) predict the impact the following malfunctions or operations of the CCW system and based (b) on the predictions, use procedures to correct, control, or mitigate the consequence of the malfunction or operations: PRMS alarm..	3.3	34(48)
010 Pressurizer Pressure Control					R							K5.02	Knowledge of operational implications of the following concepts as they apply to PZR PCS: constant enthalpy expansion through a valve	2.6	35(32)
012 Reactor Protection										R		A3.06	Ability to monitor operation of the RPS, including: RPS Trip Logic	3.7	36(22)
013 Engineered Safety Features Actuation										R		A3.01	Ability to monitor automatic operation of ESFAS including input channels and logics.	3.7	37(15)
022 Containment Cooling				R								K4.03	Knowledge of CCS design features and /or interlocks which provide automatic containment isolation	3.6	38(14)

ES-401

INDIAN POINT UNIT 2
PWR Examination Outline
Plant Systems – Tier 2/Group 1 (RO)

Form ES-401-2

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic(s)	Imp.	Q#
022 Containment Cooling							R					A2.05	Ability to (a) predict the impact the following malfunctions or operations of the CCS system and based (b) on the predictions, use procedures to correct, control, or mitigate the consequence of the malfunction or operations: major leak in the CCs system.	3.1	39(40)
025 Ice Condenser													N/A		
026 Containment Spray				R								K4.04	Knowledge of CSS design features and/or interlock which provide the following: reduction temperature and pressure in containment after a LOCA by condensing steam, to reduce radiological hazard and protect equipment from corrosion damage.	3.7	40(57)
039 Main and Reheat Steam			R									K3.04	Knowledge of the effects of a loss of the MRRS will have on the operation of: MFW Pumps.	2.5	41(11)
056 Condensate							R					A2.04	Ability to (a) predict the impact the following malfunctions or operations of the condensate system and based (b) on the predictions, use procedures to correct, control, or mitigate the consequence of the malfunction or operations: loss of a condensate pump.	2.6	42(12)
059 Main Feedwater							R					A1.07	Ability to predict and/or monitor changes in parameters (to prevent from exceeding design limits) associated with operating the MFW controls including Feed Pump Speed including normal speed for IPS.	2.5	43(10)
059 Main Feedwater	R											K1.04	Knowledge of the physical connections or cause and effect relationship between the MFW and the following system: SG Level Control System.	3.4	44(6)
061 Auxiliary / Emergency Feedwater					R							K5.01	Knowledge of the operational concepts as they apply to AFW: relationship between AFW flow and heat transfer rate.	3.6	45(18)
061 Auxiliary/Emergency Feedwater		R										K2.02	Knowledge of bus power supplies to the electric drive (motor driven) aux feed pumps.	3.7	46(1)
062 AC Electrical Distribution							R					A1.01	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the distribution system including the: significance of the diesel load limits.	3.4	47(60)

ES-401

**INDIAN POINT UNIT 2
PWR Examination Outline
Plant Systems – Tier 2/Group 1 (RO)**

Form ES-401-2

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic(s)	Imp.	Q#
063 DC Electrical Distribution		R										K2.01	Knowledge of bus power supplies to major DC Bus Loads.	2.9	48(50)
063 DC Electrical Distribution			R									K3.01	Knowledge of the effect that a loss or malfunction of the DC Electrical System will have o the following components EDGs	3.7	49(49)
064 Emergency Diesel Generator										R		A4.06	Ability to manually operate and/or monitor in the control room: manually starting, loading and stopping the EDGs.	3.9	50(21)
064 Emergency Diesel Generator									R			A3.01	Ability to monitor automatic operation of the EDGs including automatic start of air compressors and EDG.:	4.1	51(20)
073 Process Radiation Monitoring			R									K3.01	Knowledge of the effect the loss or malfunction of the PRM will have on the following: Radioactive Effluent releases.:	3.6	52(43)
076 Service Water										R		A4.04	Ability to operate or monitor in the control room: emergency heat loads.	3.5	53(7)
078 Instrument Air				R								K4.02	Knowledge of IAS design features and/or interlocks which provide the following: cross-over to other air systems.	3.2	54(42)
103 Containment										R		A4.04	Ability to monitor or operate in the control room: phase A and Phase B resets.	3.5	55(74)
K/A Category Point Totals:	2	2	4	4	3	1	2	3	3	3	1	Group Point Total:			28

ES-401

INDIAN POINT UNIT 2
PWR RO Examination Outline
Plant Systems – Tier 2/Group 2

Form ES-401-2

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic(s)	Imp.	Q#	
001 Control Rod Drive													Not Selected			
002 Reactor Coolant													Not selected			
011 Pressurizer Level Control									R			A3.03	Ability to monitor PZR LCS including charging and letdown	3.2	56(8)	
014 Rod Position Indication													Not Selected			
016 Non-nuclear Instrumentation											R	2.1.28	Knowledge of purpose and function of major components and controls.	3.2	57(5)	
017 In-Core Temperature Monitor													Not Selected			
027 Containment Iodine Removal		R											K2.01	Knowledge of power supply to the iodine removal fans	3.1	58(2)
028 Hydrogen Recombiner and Purge Control													Not selected			
029 Containment Purge	R												K1.03	Knowledge of physical connection and/o cause/effect relationship between the containment purge systems and the ESF system.	3.6	59(4)
033 Spent Fuel Pool Cooling													Not Selected			
034 Fuel Handling Equipment						R							K6.02	Knowledge of the effect of the loss or malfunction of the radiation Monitoring System will have on the Fuel Handling System	2.6	60(39)
035 Steam Generator					R								K5.03	Knowledge of the operational implications of the following as it applies to the SGs: shrink and swell.	2.8	61(17)
041 Steam Dump/Turbine Bypass Control									R				A3.05	Ability to monitor the automatic operation of the Steam Dumps including Main Steam Header Pressure.	2.9	62(16)
045 Main Turbine Generator													Not Selected			
055 Condenser Air Removal											R		2.4.11	Knowledge of abnormal condition procedures	3.4	63(47)
068 Liquid Radwaste									R				A2.04	Ability to (a) predict the impact of the following malfunctions or operation of the Liquid Radwaste System and (b) based upon those predictions use procedures to correct, control or mitigate the consequences of those malfunctions or operations failure of automatic isolation valves.	3.3	64(41)
071 Waste Gas Disposal													Not selected			
072 Area Radiation Monitoring													Not selected			

ES-401

INDIAN POINT UNIT 2
PWR RO Examination Outline
Plant Systems – Tier 2/Group 2

Form ES-401-2

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic(s)	Imp.	Q#
075 Circulating Water													Not Selected		
079 Station Air													Not selected		
086 Fire Protection						R						K6.04	Knowledge of the effect of a loss or malfunction the FPS will have on: fire, smoke and heat detectors.	2.6	65(27)
K/A Category Point Totals:	1	1			1	2		1	2		2	Group Point Total:			10

Facility: Indian Point Unit 2		Date of Exam: 10/22/2004	Exam Level: RO	
Category	K/A #	Topic	Imp.	Q#
Conduct of Operations	2.1.25	Ability to obtain and interpretation reference material such as graphs, nomographs, and tables which contain performance data.	2.8	66(9)
	2.1.10	Knowledge of conditions and limitations of the facility license.	2.7	67(38)
	2.1.32	Ability to apply all system limits and precautions.	3.4	68(37)
	Total			3
Equipment	2.2.30	.Knowledge of RO duties in the control room during fuel handling such as alarms from the fuel handling area, communications with the fuel storage facility, systems operated from the control room in support of fueling operations, and supporting instrumentation.	3.5	69(31)
Control	2.2.24	Ability to analyze the effects of maintenance activities on LCO status.	2.6	70(36)
Total			2	
Radiation Control	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	2.9	71(35)
	2.3.1	Knowledge of 10CFR20 and related facility radiation requirements	2.6	72(34)
	Total			2
Emergency Procedures / Plan	2.4.35	Knowledge of local auxiliary operator tasks during emergency including system geography and systems implications.	3.3	73(59)
	2.4.23	Knowledge of bases for prioritizing emergency procedure implementation during emergency operation.	2.8	74(58)
	2.4.19	Knowledge of EOP layout, symbols, and icons.	2.7	75(30)
	Total			3
Tier 3 Point Total RO				10

Facility:		Date of Exam:																			
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	2	3	N/A			4	4	N/A			2	18	4	2	6				
	2	2	1	2	N/A			1	2	N/A			1	9	2	2	4				
	Tier Totals	5	3	5	N/A			5	6	N/A			3	27	6	4	10				
2. Plant Systems	1	2	2	4	4	3	1	2	3	3	3	1	28	3	2	5					
	2	1	1	0	0	1	2	0	1	2	0	2	10	2	1	3					
	Tier Totals	3	3	4	4	4	3	2	4	5	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			
<p>Note:</p> <ol style="list-style-type: none"> 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 that are not included on the outline should be added. Refer to ES-401, Attachment 2, 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. 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. 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. 																					

ES-401

INDIAN POINT UNIT 2
PWR Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1/Group 2 (SRO)

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	Imp.	Q#
000007 (BW/E02 & E10; CE/E02) / Reactor Trip – Stabilization – Recovery / 1						S	2.4.30	Knowledge of events that involve system operations that should be reported to outside agencies.	3.6	76
000008 / Pressurizer Vapor Space Accident / 3					S		AA2.05	Ability to determine and interpret the following as they apply to a vapor space accident: PORV isolation(block)valve switches and indications..	3.9	77
000009 / Small Break LOCA / 3										
000011 / Large Break LOCA / 3										
000015/17 RCP Malfunctions / 4										
000022 / Loss of Reactor Coolant Makeup / 2					S		AA2.03	Ability to determine and interpret the following as they apply to the Reactor Coolant Makeup Pump: failure of flow control valve or controller	3.6	78
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										
000040 (BW/E05; CE/E05; W/E12) / Steam Line Rupture – Excessive Heat Transfer / 4										
000054 (CE/E06) / Loss of Main Feedwater / 4						S	2.4.18	Knowledge of specific bases for EOPs.	3.6	79
000055 / Station Blackout / 6										
000056 / Loss of Off-site Power / 6										
000057 / Loss of Vital AC Elec. Inst. Bus / 6					S		AA2.19	The plant automatic actions that occur on a loss of vital instrument bus.	4.3	80
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										
BW/E04; W/E05 / Inadequate Heat Transfer – Loss of Secondary Heat Sink / 4					S		EA2.1	Facility conditions and selection of appropriate procedures during abnormal and emergency operations.	4.4	81
K/A Category Point Totals:					4	2				6
000001 / Continuous Rod Withdrawal / 1										
000003 / Dropped Control Rod / 1										
000005 Inoperable/Stuck Control Rod / 1						S	2.1.12	Ability to apply technical specifications for a system.	4.0	82

ES-401

INDIAN POINT UNIT 2
PWR Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1/Group 2 (SRO)

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	Imp.	Q#
000024 Emergency Boration / 1										
000028 / Pressurizer Level Malfunction / 2										
000032 / Loss of Source Range NI / 7						S	G2.4.11	Knowledge of abnormal condition procedures.	3.6	83
000033 / Loss of Intermediate Range NI / 7										
000036 (BW/A08) / Fuel Handling Accident / 8					S		AA2.03	Ability to determine and interpret the following as they apply to fuel handling accidents: magnitude of the potential radioactive release.	4.2	84
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										
000074 (W/E06 & E07) / Inad. Core Cooling / 4										
000076 / High Reactor Coolant Activity / 9										
WE/01 & 02 / Rediagnosis & SI Termination / 3										
WE/13 / Steam Generator Over-pressure / 4										
WE/15 / Containment Flooding / 5										
WE/16 / 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										
BW/E09; CE/A13; W/E09 & 10 Natural Circ. / 4					S		EA2.2	Adherence to appropriate procedures and operations within the limitations of the facility license and amendments.	3.8	85
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										

ES-401

INDIAN POINT UNIT 2
 PWR Examination Outline
 Emergency and Abnormal Plant Evolutions – Tier 1/Group 2 (SRO)

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	Imp.	Q#
K/A Category Point Totals:					2	2		Group Point Total:		4

ES-401

INDIAN POINT UNIT 2
PWR Examination Outline
Plant Systems – Tier 2/Group 1 (SRO)

Form ES-401-2

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic(s)	Imp.	Q#
003 Reactor Coolant Pump															
004 Chemical and Volume Control															
005 Residual Heat Removal								S				A2.02	Pressure Transient Protection during cold shutdown	3.7	86
006 Emergency Core Cooling															
007 Pressurizer Relief/Quench Tank											S	2.1.25	Ability to obtain and interpret station reference materials such as graphs, nomographs, and tables with performance data.	3.1	87
008 Component Cooling Water															
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											S	2.4.30	Knowledge of events related to system operations that should be reported to outside agencies.	3.6	88
061 Auxiliary / Emergency Feedwater								S				A2.08	Ability to (a) predict the impact of the following malfunctions or the operation on the AFW; and (b) based upon those predictions, use procedures to correct, controls, or mitigate the consequences of those malfunctions or operations: flow rates from various combinations of AFW pump discharge valves.	2.9	89
062 AC Electrical Distribution															
063 DC Electrical Distribution															
064 Emergency Diesel Generator								S				A2.04	Unloading prior to securing the EDG	3.0	90
073 Process Radiation Monitoring															

ES-401

INDIAN POINT UNIT 2
PWR Examination Outline
Plant Systems – Tier 2/Group 1 (SRO)

Form ES-401-2

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic(s)	Imp.	Q#
076 Service Water															
078 Instrument Air															
103 Containment															
K/A Category Point Totals:								3			2		Group Point Total:		5

ES-401

INDIAN POINT UNIT 2
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)	Imp.	Q#
001 Control Rod Drive															
002 Reactor Coolant															
011 Pressurizer Level Control								S				AA2.02	Ability to (a) predict the impact of the following malfunctions or operation on the PZR the PLCS and (b) based upon these predictions, use procedures to correct , control or mitigate the consequences of those malfunctions or operations: excessive charging	3.2	91
014 Rod Position Indication															
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															
035 Steam Generator											G	2.4.7	Knowledge of Event Based EOP Mitigation Strategies	3.8	92
041 Steam Dump/Turbine Bypass Control															
045 Main Turbine Generator								S				A2.11	Control problems in the primary, i.e., axial flux imbalance: need to reduce load on the secondary.	2.9	93
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:								2			1	Group Point Total:			3

Facility: Indian Point Unit 2		Date of Exam:	Exam Level: SRO	
Category	K/A #	Topic	Imp.	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	94
	2.1.7	Ability to evaluate plant performance and make operational judgments based upon operating characteristics ,reactor behavior, and instrumentation interpretation.	4.4	95
	Total			2
Equipment Control	2.2.17	Knowledge of the process for managing maintenance activities during power operations.	3.5	96
	2.2.29	Knowledge of SRO fuel handling responsibilities..	3.8	97
	Total			2
Radiation Control	2.3.6	Knowledge of the requirements for reviewing and approving release permits.	3.1	98
	Total			1
Emergency Procedures / Plan	2.4.41	Knowledge of the emergency action level thresholds and classifications.	4.1	99
	2.4.28	Knowledge of procedures relating to the emergency response to sabotage.	3.3	1003
	Total			2
Tier 3 Point Total SRO				7

Tier / Group	Randomly Selected K/A	Reason for Rejection
3	2.4.23	Same as selected on RO exam. Replaced with EPLAN K/A
1/1	000009-AA1.15	Not a A2 per NUREG 1021. Re-selected K/A -AA2.05
1/1	000054-AK1.02	Not a A2 or G-re-selected G2.4.18
1/1	000057-AK3.04	Not a A2 or G-re-selected AA2.19
1/1	000062 AK3.02	Not a A2 or G –reselected AA2.01
1/2	000001 AK1,02	Not a A2 or G-re-selected G2.1.11
1/2	000068 AK3.10	Not a A2 or G-re-selected AA2.06
1/2	E09 EK2.01	Not a A2 or G-re-selected EA.2.2
2/1	007A1.03	Not a A2 or G-re-selected-G2.1.25
2/1	059 K4.16-	Not A2 or G –reselected G2.4.30
2/1	064 K4.10	Not A2 or G-re-selected A2.04
2/2	011 A.104	Not A2 or G-reselected AA2.02
2/2	045 A3.07	Not A2 or G-reselected AA2.11