

Facility: Indian Point Unit 3

Printed: 06/28/2010

Date Of Exam: 10/04/2010

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 & Abnormal Plant Evolutions	1	3	3	3	N/A			3	3	N/A			3	18	3		3	6
	2	2	2	1				2	1				1	9	2		2	4
	Tier Totals	5	5	4				5	4				4	27	5		5	10
2. Plant Systems	1	3	2	3	3	3	2	3	3	2	2	2	28	3		2	5	
	2	1	1	0	1	1	1	1	1	1	1	1	10	1	1	1	3	
	Tier Totals	4	3	3	4	4	3	4	4	3	3	3	38	5		3	8	
3. Generic Knowledge And Abilities Categories				1		2		3		4		10		1	2	3	4	7
				2		3		2		3				2	1	2	2	

Note:

1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).
2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ± 1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.
3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.
4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.
5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
- 7.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.
8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.
9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

PWR RO/SRO Examination Outline

Facility: Indian Pont Unit 3

NRC Written Examination Outline

ES-401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic	Imp.	Q#
000007 Reactor Trip - Stabilization - Recovery / 1					X		EA2.02	Ability to determine and interpret the following as they apply to a reactor trip: - Proper actions to be taken if the automatic safety functions have not taken place	4.3	1
000009 Small Break LOCA / 3						X	2.1.45	Conduct of Operations - Ability to identify and interpret diverse indications to validate the response of another indication.	4.3	2
000011 Large Break LOCA / 3				X			EA1.03	Ability to operate and/or monitor the following as they apply to a Large Break LOCA: - Securing of RCPs	4.0	4
000015/000017 RCP Malfunctions / 4						X	2.1.37	Conduct of Operations - Knowledge of procedures, guidelines, or limitations associated with reactivity management.	4.3	3
000025 Loss of RHR System / 4						X	2.1.45	Conduct of Operations - Ability to identify and interpret diverse indications to validate the response of another indication.	4.3	76
000026 Loss of Component Cooling Water / 8			X				AK3.04	Knowledge of the reasons for the following responses as they apply to the Loss of Component Cooling Water: - Effect on the CCW flow header of a loss of CCW	3.5	5
000026 Loss of Component Cooling Water / 8						X	2.4.4	Emergency Procedures/Plan - Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.7	77
000029 ATWS / 1						X	2.4.13	Emergency Procedures/Plan - Knowledge of crew roles and responsibilities during EOP use.	4.0	7
000038 Steam Gen. Tube Rupture / 3			X				EK3.09	Knowledge of the reasons for the following responses as they apply to the SGTR: - Criteria for securing/throttling ECCS	4.1	8

PWR RO/SRO Examination Outline

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NRC Written Examination Outline

ES-401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic	Imp.	Q#
000040 Steam Line Rupture - Excessive Heat Transfer / 4			X				AK3.01	Knowledge of the reasons for the following responses as they apply to the Steam Line Rupture: - Operation of steam line isolation valves	4.2	6
000054 Loss of Main Feedwater / 4					X		AA2.03	Ability to determine and interpret the following as they apply to the Loss of Main Feedwater (MFW): - Conditions and reasons for AFW pump startup	4.2	78
000055 Station Blackout / 6					X		EA2.01	Ability to determine and interpret the following as they apply to a Station Blackout: - Existing valve positioning on a loss of instrument air system	3.4	9
000056 Loss of Off-site Power / 6	X						AK1.03	Knowledge of the operational implications of the following concepts as they apply to Loss of Offsite Power: - Definition of subcooling: use of steam tables to determine it	3.1	10
000057 Loss of Vital AC Inst. Bus / 6				X			AA1.05	Ability to operate and/or monitor the following as they apply to the Loss of Vital AC Instrument Bus: - Backup instrument indications	3.2	11
000058 Loss of DC Power / 6	X						AK1.01	Knowledge of the operational implications of the following concepts as they apply to Loss of DC Power: - Battery charger equipment and instrumentation	2.8	12
000058 Loss of DC Power / 6					X		AA2.02	Ability to determine and interpret the following as they apply to the Loss of DC Power: - 125V dc bus voltage, low/critical low, alarm	3.6	79
000062 Loss of Nuclear Svc Water / 4					X		AA2.01	Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: - Location of a leak in the SWS	2.9	13

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ES-401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic	Imp.	Q#
000062 Loss of Nuclear Svc Water / 4						X	2.2.22	Equipment Control - Knowledge of limiting conditions for operations and safety limits.	4.7	80
000065 Loss of Instrument Air / 8				X			AA1.04	Ability to operate and/or monitor the following as they apply to the Loss of Instrument Air: - Emergency air compressor	3.5	14
000077 Generator Voltage and Electric Grid Disturbances / 6		X					AK2.05	Knowledge of the interrelations between Generator Voltage and Electrical Grid Disturbances and the following: - Pumps	3.1	15
W/E04 LOCA Outside Containment / 3					X		EA2.1	Ability to determine and interpret the following as they apply to the LOCA Outside Containment: - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	4.3	81
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4		X					EK2.1	Knowledge of the interrelations between the Loss of Secondary Heat Sink and the following: - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.7	16
W/E11 Loss of Emergency Coolant Recirc. / 4		X					EK2.1	Knowledge of the interrelations between the Loss of Emergency Coolant Recirculation and the following: - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.6	17

PWR RO/SRO Examination Outline

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NRC Written Examination Outline

ES-401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic	Imp.	Q#
W/E12 - Steam Line Rupture - Excessive Heat Transfer / 4	X						EK1.1	Knowledge of the operational implications of the following concepts as they apply to the Uncontrolled Depressurization of all Steam Generators: - Components:, capacity, and function of emergency systems	3.4	18

PWR RO/SRO Examination Outline

Facility: Indian Pont Unit 3

NRC Written Examination Outline

ES-401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic	Imp.	Q#
000001 Continuous Rod Withdrawal / 1		X					AK2.01	Knowledge of the interrelations between the Continuous Rod Withdrawal and the following: - Rod bank step counters	2.9	19
000003 Dropped Control Rod / 1 <i>KA Number(2.2.37 vice 2.1.37) incorrectly entered for outline submittal</i>						X	2.2.37	Equipment Control - Ability to determine operability and/or availability of safety related equipment.	4.6	82
000028 Pressurizer Level Malfunction / 2						X	2.2.25	Equipment Control - Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	4.2	83
000032 Loss of Source Range NI / 7	X						AK1.01	Knowledge of the operational implications of the following concepts as they apply to Loss of Source Range Nuclear Instrumentation: - Effects of voltage changes on performance	2.5	20
000033 Loss of Intermediate Rang NI / 7			X				AK3.02	Knowledge of the reasons for the following responses as they apply to the Loss of Intermediate Range Nuclear Instrumentation: - Guidance contained in EOP for loss of intermediate-range instrumentation	3.6	21
000036 Fuel Handling Accident / 8				X			AA1.02	Ability to operate and/or monitor the following as they apply to the Fuel Handling Incidents: - ARM system	3.1	22
000068 Control Room Evac. / 8						X	2.1.37	Conduct of Operations - Knowledge of procedures, guidelines, or limitations associated with reactivity management.	4.3	23
000076 High Reactor Coolant Activity / 9					X		AA2.01	Ability to determine and interpret the following as they apply to the High Reactor Coolant Activity: - Location or process point that is causing an alarm	3.2	84

PWR RO/SRO Examination Outline

Facility: Indian Pont Unit 3

NRC Written Examination Outline

ES-401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic	Imp.	Q#
W/E02 SI Termination / 3	X						EK1.2	Knowledge of the operational implications of the following concepts as they apply to the SI Termination: - Normal, abnormal and emergency operating procedures associated with SI Termination	3.4	24
W/E03 LOCA Cooldown - Depress. / 4					X		EA2.1	Ability to determine and interpret the following as they apply to the LOCA Cooldown and Depressurization: - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	3.4	25
W/E06 Inad. Core Cooling / 4				X			EA1.3	Ability to operate and/or monitor the following as they apply to the Degraded Core Cooling: - Desired operating results during abnormal and emergency situations	3.7	26
W/E09 Natural Circ. / 4					X		EA2.2	Ability to determine and interpret the following as they apply to the Natural Circulation Operations: - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.8	85
W/E14 Loss of CTMT Integrity / 5		X					EK2.1	Knowledge of the interrelations between the High Containment Pressure and the following: - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.4	27

PWR RO/SRO Examination Outline

Facility: Indian Pont Unit 3

**NRC Written Examination Outline
Plant Systems - Tier 2 / Group 1**

ES-401

Form ES-401-2

System #/Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic	Imp	Q#
003 Reactor Coolant Pump	X											K1.01	Knowledge of the physical connections and/or cause-effect relationships between the RCPS and the following systems: - RCP lube oil	2.6	28
003 Reactor Coolant Pump			X									K3.01	Knowledge of the effect that a loss or malfunction of the RCPS will have on the following: - RCS	3.7	43
004 Chemical and Volume Control											X	2.2.22	Knowledge of limiting conditions for operations and safety limits	4.0	30
005 Residual Heat Removal		X										K2.01	Knowledge of bus power supplies to the following: - RHR pumps	3.0	31
005 Residual Heat Removal								X				A2.03	Ability to (a) predict the impacts of the following malfunctions or operations on the RHRS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - RHR pump/motor malfunction	2.9	32
006 Emergency Core Cooling			X									K3.03	Knowledge of the effect that a loss or malfunction of the ECCS will have on the following: - Containment	4.2	33
006 Emergency Core Cooling											X	2.2.39	Equipment Control - Knowledge of less than or equal to one hour technical specification action statements for systems.	4.5	86

PWR RO/SRO Examination Outline

Facility: Indian Pont Unit 3

**NRC Written Examination Outline
Plant Systems - Tier 2 / Group 1**

ES-401

Form ES-401-2

System #/Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic	Imp	Q#
007 Pressurizer Relief/Quench Tank								X				A2.04	Ability to (a) predict the impacts of the following malfunctions or operations on the PRTS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Overpressurization of the waste gas vent header	2.5	34
008 Component Cooling Water	X											K1.01	Knowledge of the physical connections and/or cause-effect relationships between the CCWS and the following systems: - SWS	3.1	35
008 Component Cooling Water										X		A4.08	Ability to manually operate and/or monitor in the control room: - CCW pump control switch	3.1*	36
010 Pressurizer Pressure Control					X							K5.02	Knowledge of the operational implications of the following concepts as they apply to the PZR PCS: - Constant enthalpy expansion through a valve	2.6	37
010 Pressurizer Pressure Control								X				A2.02	Ability to (a) predict the impacts of the following malfunctions or operations on the PZR PCS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Spray valve failures	3.9	87
012 Reactor Protection			X									K3.01	Knowledge of the effect that a loss or malfunction of the RPS will have on the following: - CRDS	3.9	38
012 Reactor Protection									X			A3.01	Ability to monitor automatic operation of the RPS, including: - Individual channel	3.8	29
013 Engineered Safety Features Actuation						X						K6.01	Knowledge of the effect of a loss or malfunction of the following will have on the ESFAS: - Sensors and detectors	2.7*	39

PWR RO/SRO Examination Outline

Facility: Indian Pont Unit 3

**NRC Written Examination Outline
Plant Systems - Tier 2 / Group 1**

ES-401

Form ES-401-2

System #/Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic	Imp	Q#
013 Engineered Safety Features Actuation		X										K2.01	Knowledge of bus power supplies to the following: - ESFAS/safeguards equipment control	3.6	40
022 Containment Cooling				X								K4.03	Knowledge of CCS design feature(s) and/or interlock(s) which provide for the following: - Automatic containment isolation	3.6	41
022 Containment Cooling								X				A2.06	Ability to (a) predict the impacts of the following malfunctions or operations on the CCS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Loss of CCS pump	3.2*	88
026 Containment Spray										X		A4.01	Ability to manually operate and/or monitor in the control room: - CSS controls	4.5	42
059 Main Feedwater							X					A1.03	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MFW System controls including: - Power level restrictions for operation of MFW pumps and valves	2.7*	44
059 Main Feedwater										X		2.1.23	Conduct of Operations - Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.4	89
061 Auxiliary/Emergency Feedwater					X							K5.01	Knowledge of the operational implications of the following concepts as they apply to the AFW System: - Relationship between AFW flow and RCS heat transfer	3.6	45

PWR RO/SRO Examination Outline

Facility: Indian Pont Unit 3

**NRC Written Examination Outline
Plant Systems - Tier 2 / Group 1**

ES-401

Form ES-401-2

System #/Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic	Imp	Q#
061 Auxiliary/Emergency Feedwater				X								K4.01	Knowledge of AFW System design feature(s) and/or interlock(s) which provide for the following: - Water sources and priority of use	4.1	46
062 AC Electrical Distribution								X				A2.12	Ability to (a) predict the impacts of the following malfunctions or operations on the A.C. Distribution System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Restoration of power to a system with a fault on it	3.2	47
063 DC Electrical Distribution				X								K4.01	Knowledge of D.C. Electrical System design feature(s) and/or interlock(s) which provide for the following: - Manual/automatic transfers of control	2.7	48
063 DC Electrical Distribution								X				A2.01	Ability to (a) predict the impacts of the following malfunctions or operations on the D.C. Electrical System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Grounds	3.2*	90
064 Emergency Diesel Generator						X						K6.07	Knowledge of the effect of a loss or malfunction of the following will have on the ED/G System: - Air receivers	2.7	49
064 Emergency Diesel Generator							X					A1.08	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ED/G System controls including: - Maintaining minimum load on ED/G (to prevent reverse power)	3.1	50

PWR RO/SRO Examination Outline

Facility: Indian Pont Unit 3

**NRC Written Examination Outline
Plant Systems - Tier 2 / Group 1**

ES-401

Form ES-401-2

System #/Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic	Imp	Q#
073 Process Radiation Monitoring	X											K1.01	Knowledge of the physical connections and/or cause-effect relationships between the PRM System and the following systems: - Those systems served by PRMs	3.6	51
073 Process Radiation Monitoring					X							K5.01	Knowledge of the operational implications of the following concepts as they apply to the PRM System: - Radiation theory, including sources, types, units, and effects	2.5	52
076 Service Water							X					A1.02	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the SWS controls including: - Reactor and turbine building closed cooling water temperatures	2.6*	53
078 Instrument Air									X			A3.01	Ability to monitor automatic operation of the IAS, including: - Air pressure	3.1	54
103 Containment											X	2.1.45	Conduct of Operations - Ability to identify and interpret diverse indications to validate the response of another indication.	4.3	55

PWR RO/SRO Examination Outline

Facility: Indian Pont Unit 3

**NRC Written Examination Outline
Plant Systems - Tier 2 / Group 2**

ES-401

Form ES-401-2

System #/Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topic	Imp	Q#
002 Reactor Coolant	X											K1.05	Knowledge of the physical connections and/or cause-effect relationships between the RCS and the following systems: - PRT	3.2	56
011 Pressurizer Level Control							X					A1.02	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PZR LCS controls including: - Charging and letdown flows	3.3	57
014 Rod Position Indication				X								K4.05	Knowledge of RPIS design feature(s) and/or interlock(s) which provide for the following: - Rod hold interlocks	3.1	63
014 Rod Position Indication								X				A2.01	Ability to (a) predict the impacts of the following malfunctions or operations on the RPIS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Loss of offsite power	3.3	91
015 Nuclear Instrumentation					X							K5.10	Knowledge of the operational implications of the following concepts as they apply to the NIS: - Ex-core detector operation	2.8	58
017 In-core Temperature Monitor						X						K6.01	Knowledge of the effect of a loss or malfunction of the following will have on the ITM System components: - Sensors and detectors	2.7	59
034 Fuel Handling Equipment						X						K6.01	Knowledge of the effect of a loss or malfunction of the following will have on the Fuel Handling System: - Fuel handling equipment	3.0	92

PWR RO/SRO Examination Outline

Facility: Indian Pont Unit 3

NRC Written Examination Outline

ES-401

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	Imp	Q#
035 Steam Generator								X				A2.06	Ability to (a) predict the impacts of the following malfunctions or operations on the S/GS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Small break LOCA	4.5	60
041 Steam Dump/Turbine Bypass Control									X			A3.03	Ability to monitor automatic operation of the SDS, including: - Steam flow	2.7	61
045 Main Turbine Generator											X	2.1.43	Conduct of Operations - Ability to use procedures to determine the effects on reactivity of plant changes, such as reactor coolant system temperature, secondary plant, fuel depletion, etc.	4.1	62
045 Main Turbine Generator											X	2.4.04	Emergency Procedures/Plan - Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.7	93
075 Circulating Water		X										K2.03	Knowledge of bus power supplies to the following: - Emergency/essential SWS pumps	2.6	64
086 Fire Protection										X		A4.01	Ability to manually operate and/or monitor in the control room: - Fire water pumps	3.3	65

Generic Knowledge and Abilities Outline (Tier 3)

PWR RO/SRO Examination Outline

Facility: Indian Pont Unit 3

Form ES-401-3

Facility	Indian Point Unit 3		Date of Exam		10/4/2010			
Category	K/A #	Topic	RO		SRO-Only			
			IR	Q#	IR	Q#		
1. Conduct of Operations	2.1.39	Knowledge of conservative decision making practices.	3.6	67				
	2.1.40	Conduct of Operations - Knowledge of refueling administrative requirements.	2.8	68				
	2.1.6	Ability to manage the control room crew during plant transients.			4.8	94		
	2.1.7	Conduct of Operations - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.			4.7	95		
	Subtotal		2		2			
2. Equipment Control	2.2.25	Equipment Control - Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.2	69				
	2.2.37	Equipment Control - Ability to determine operability and/or availability of safety related equipment.	3.6	66				
	2.2.39	Knowledge of less than or equal to one hour Technical Specification action statements for systems.	3.9	70				
	2.2.14	Knowledge of the process for controlling equipment configuration or status.			4.3	96		
	Subtotal		3		1			

Generic Knowledge and Abilities Outline (Tier 3)

PWR RO/SRO Examination Outline

Facility: Indian Pont Unit 3

Form ES-401-3

Facility	Indian Point Unit 3		Date of Exam		10/4/2010	
Category	K/A #	Topic	RO		SRO-Only	
			IR	Q#	IR	Q#
3. Radiological Controls	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		
	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.	3.4	72		
	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.			3.7	97
	2.3.5	Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personal monitoring equipment, etc.			2.9	98
	Subtotal			2		2
4. Emergency Procedures/plan	2.4.20	Knowledge of operational implications of EOP warnings, cautions, and notes.	3.8	73		
	2.4.34	Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.	4.2	74		
	2.4.45	Ability to prioritize and interpret the significance of each annunciator or alarm.	4.1	75		
	2.4.11	Knowledge of abnormal condition procedures.			4.2	99
	2.4.32	Knowledge of operator response to loss of all annunciators.			4.0	100
Subtotal			3		2	
Tier 3 Point Totals				10		7

Description of program used to generate IPEC Unit 3 July 2010 Written Exam K/As

Generated the RO and SRO sample plan using the "NKEG" Database Program, version 1.1, developed by Westinghouse Electric Company. This program will automatically produce a Random Sample Plan based on NUREG 1122, Rev. 2, Supplement 1 K/As.

K/As were suppressed prior to the outline generation process as provided for in the examiner standard, the list of suppressed K/As is provided as required by the examiners standard.

Inappropriate and inapplicable K/As were discarded during the outline development process and are included in the record of rejected K/As. The replacement K/As were replaced using the random sample function of the NKEG database program.

Tier / Group	Randomly Selected K/A		Reason for Rejection
R-1/1	000008 AK1.02	Knowledge of the operational implications of the following concepts as they apply to a Pressurizer Vapor Space Accident: - Change in leak rate with change in pressure	Rejected due to similarities to Question # 2
R-1/1	000009 G 2.2.40	Equipment Control - Ability to apply technical specifications for a system.	This Generic KA is not applicable to off-normal procedures
R-1/1	000011 EA2.09	Ability to determine and interpret the following as they apply to a Large Break LOCA: - Existence of adequate natural circulation	KA is not applicable. Natural Circulation does not exist during a Large Break LOCA.
R-1/1	000022 1.08	Ability to operate and/or monitor the following as they apply to the Loss of Reactor Coolant Pump Makeup: - VCT level	KA is not applicable. Makeup to RCP standpipe if from primary water not CVCS
R-1/1	000027 G2.2.15	Equipment Control – Ability to determine the expected plant configuration using design and configuration control documentation, such as drawings, line ups, tag outs, etc.	This Generic KA is not applicable for APE/EPE written examination. This KA is evaluated during Simulator and/or JPM Examinations.
R-1/1	000027 AK3.03	Knowledge of the reasons for the following responses as they apply to the Pressurizer Pressure Control Malfunctions: - Actions contained in EOP for PZR PCS malfunction	KA Rejected due to similarity with Simulator Examination
S-1/1	000040 2.4.6	Emergency Procedures/Plan - Knowledge of EOP mitigation strategies.	Rejected due to inability to develop an SRO level question for mitigation strategies for Steam Line Rupture.
R-1/1	000062 G2.1.3	Conduct of Operations – Ability to perform specific system and integrated plant procedures during all modes of plant operation.	This Generic KA is evaluated during Simulator Exam
R-1/2	000076 G2.2.41	Ability to obtain and interpret station electrical and mechanical drawings.	This Generic KA is not applicable for APE/EPE written examination. This KA is evaluated during Simulator and/or JPM Examinations.

R-1/2	000024 AK3.02	Knowledge of the reasons for the following responses as they apply to the Emergency Boration: - Actions contained in EOP for emergency boration	This concept is evaluated on JPM exam
S-1/2	000051 G2.3.14	Radiological Controls – Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.	This Generic KA is not applicable to Loss of Condenser Vacuum off-normal procedure.
R-1/2	000067 AA1.08	Ability to operate and/or monitor the following as they apply to the Plant Fire on Site: - Fire fighting equipment used on each class of fire	Unable to write a discriminatory RO level question for this KA
S-1/2	000068 G2.3.14	Radiological Controls – Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.	Unable to write a discriminatory SRO level question for this KA
S-1/2	000068 G2.2.37	Equipment Control - Ability to determine operability and/or availability of safety related equipment.	This generic KA is not applicable to Control Room Evacuation APE.
R-1/2	W/E16 G2.4.47	Emergency Procedures/Plan - Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	This Generic KA is evaluated during Simulator Exam
R-2/1	004000 K4.13	Knowledge of CVCS design feature(s) and/or interlock(s) which provide for the following: - Interlock between letdown isolation valve and flow control valve	NA at IPEC – No Interlock exists.
R-2/1	004000 A4.04	Ability to manually operate and/or monitor in the control room: - Calculation of boron concentration changes	Rejected due to similarity with JPM
R-2/1	006000 K3.02	Knowledge of the effect that a loss or malfunction of the ECCS will have on the following: - Fuel	KA Rejected due to similarity with question 26
R-2/1	007000 G2.2.42	Equipment Control - Ability to recognize system parameters that are entry level conditions for Technical Specifications.	NA at IPEC – No Tech Spec or TRM exist for the PRT

R-2/1	010000 G2.4.47	Emergency Procedures/Plan - Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	This KA is evaluated during Simulator Exam
R-2/1	039000 K3.06	Knowledge of the effect that a loss or malfunction of the MRSS will have on the following: - SDS	Rejected due to similarity with question 61
S-2/1	012000 A2.06	Ability to (a) predict the impacts of the following malfunctions or operations on the RPS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: - Failure of RPS signal to trip the reactor	Rejected due to similarities with Question 38
R-2/1	062000 A3.01	Ability to monitor automatic operation of the A.C. Distribution System, including: - Vital ac bus amperage	NA at IPEC – Not able to monitor Vital AC bus amp in the control room
R-2/2	028000 K2.01	Knowledge of bus power supplies to the following: - Hydrogen recombiners	Unable to write a discriminatory RO question for this KA
R-2/2	034000 K4.02	Knowledge of Fuel Handling System design feature(s) and/or interlock(s) which provide for the following: - Fuel movement	Rejected RO are not directly involved in Fuel Handling activities at IPEC.
R-2/2	072000 K4.02	Knowledge of ARM system design feature(s) and/or interlock(s) which provide for the following: - Fuel building isolation	KA rejected due to similarity with question 22
S-2/2	075000 2.1.15	Conduct of Operations - Knowledge of administrative requirements for temporary management directives, such as standing orders, night orders, Operations memos, etc.	This Generic KA is not applicable to the Circulating Water System.
R-2/2	079000 A4.01	Ability to manually operate and/or monitor in the control room: - Cross-tie valves with IAS	KA rejected due to similarity with question 14
R-3	2.1.19	Ability to use plant computers to evaluate system or component status.	This is evaluated during Simulator Exam
S-3	2.2.7	Knowledge of the process for conducting special or infrequent tests.	Unable to write a discriminatory SRO question for this KA

R-3	2.2.13	Knowledge of tagging and clearance procedures.	This concept is evaluated during JPM Exam
R-3	2.2.20	Knowledge of the process for managing troubleshooting activities.	KA rejected because ROs do not manage troubleshooting activities.

Facility: Indian Point Unit 3Date of Examination: October 4, 2010Examination Level: RO ☐SRO-U ☒

Operating Test Number: _____

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N, R	Review a gross leakrate determination calculation 2.1.7 (4.7) Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretations
Conduct of Operations	M, R	Review Reactor Vessel Venting Time Per FR-I.3, Attachment 4 2.1.25 (4.2) Ability to interpret reference materials, such as graphs, curves, tables, etc.
Equipment Control	N, R	Review a Safety Function Determination 2.2.37 (4.6) Ability to determine operability and/or availability of safety related equipment
Radiation Control	N, R	Review a Manual Gaseous Rad Waste Release Permit 2.3.6 (3.8) Ability to approve release permits
Emergency Procedures/Plan	M, R, P	Classify E-Plan Event and Complete Part 1 Form 2.4.38 (4.4) Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required.

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

* Type Codes & Criteria:

(C)ontrol room, (S)imulator, or Class(R)oom
 (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
 (N)ew or (M)odified from bank (≥ 1)
 (P)revious 2 exams (≤ 1 ; randomly selected)

Facility: Indian Point Unit 3Date of Examination: October 4, 2010Exam Level: RO ☐ SRO-I ☐ **SRO-U X**

Operating Test No.: _____

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

System / JPM Title	Type Code*	Safety Function
a. NA for SRO-U	na	na
b. Transfer to Cold Leg Recirculation	D, A, EN, L	2
c. NA for SRO-U	na	na
d. NA for SRO-U	na	na
e. NA for SRO-U	na	na
f. Remove a Power Range Nuclear Instrument from Service	D	7
g. Reset R-18 Alarm Setpoint Using RM-23A	N	9
h. NA for SRO-U	na	na

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

i. Locally Start 32 Auxiliary Boiler Feed Pump	D, A, E, L	4-S
j. NA for SRO-U	na	na
k. Perform Local Containment Isolation Valve Lineup IVSW (SOP-CB-11 steps 1-5)	N, EN, L, R	8

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

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	$\leq 9 / \leq 8 / \leq 4$
(E)mergency or abnormal in-plant	$\geq 1 / \geq 1 / \geq 1$
(EN)gineered safety feature	- / - / ≥ 1 (control room system)
(L)ow-Power / Shutdown	$\geq 1 / \geq 1 / \geq 1$
(N)ew or (M)odified from bank including 1(A)	$\geq 2 / \geq 2 / \geq 1$
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$ (randomly selected)
(R)CA	$\geq 1 / \geq 1 / \geq 1$
(S)imulator	

SRO
INDIAN POINT UNIT 3 NRC RO EXAMINATION

CONDUCT OF OPERATIONS: Review a gross leakrate determination calculation. The candidate will be given a set of conditions and appropriate indications and a manual leakrate calculation. The candidate will review the leakrate calculation and locate errors.

- This is a New JPM
- SRO Only

CONDUCT OF OPERATIONS: Review Reactor Vessel Venting Time Per FR-1.3, Attachment

4 The candidate will be given a set of plant conditions with a void in the reactor vessel head. The candidate will be given a reactor vessel venting time calculation and directions to review calculation. The calculation is incorrect and the candidate must locate the errors.

- This is a bank JPM
- SRO Only.

EQUIPMENT CONTROL: Review a Safety Function Determination. The candidate will be given a set of plant/equipment conditions including degraded power sources and equipment failures. The candidate will be directed to perform a Safety Function Determination in accordance with OAP-034.

- This is a New JPM
- SRO Only.

RADIATION CONTROL: Review a Manual Gaseous Rad Waste Release Permit. The candidate will be given a set of plant conditions for the VC Pressure Relief and a manually prepared release permit. The candidate will be directed to review the release permit in accordance with 3-SOP-WDS-013. The candidate must locate errors on the permit.

- This is a Modified Bank JPM
- SRO Only.

EMERGENCY PROCEDURES/PLAN: Classify E-Plan Event and Complete Part 1 Form. The candidate will be given a set of plant conditions. The candidate must evaluate the conditions, determine the emergency plan classification and complete the New York State Part 1 form

- This is a Modified Bank JPM.
- This is a Time Critical JPM
- SRO Only.

- a. NA for SRO-U
- b. **Transfer to Cold Leg Recirculation:** The candidate will enter the simulator following a large break LOCA. The RWST will be at the level requiring transfer to cold leg recirculation. The candidate will be directed to establish cold leg recirculation using 3-ES-1.3. The recirculation pumps will not start and the candidate will be required to establish recirculation using the RHR pumps
- This is a bank JPM.
 - Failure to properly perform this JPM will result in inadequate cooling of the core and possible core damage.
- c. NA for SRO-U
- d. NA for SRO-U
- e. NA for SRO-U
- f. **Remove a Power Range Nuclear Instrument from Service:** The candidate will enter the simulator at any power level. The candidate will be told that one Power Range NI channel is indicating erratically and the Shift Manager has declared the channel inoperable. The candidate will be directed to remove the Power Range Channel from service in accordance with 3-SOP-NI-001.
- This is a bank JPM.
 - Failure to properly perform this task will result in a Tech Spec violation/
- g. **Reset R-18 Alarm Setpoint Using RM-23A:** The candidate will enter the simulator at any power level. The candidate will be directed to reset the Alarm setpoint for R-18, Liquid Rad Waste Release Monitor. The candidate will be told that the Bantam 11 computer system is OOS and the setpoint must be changed using the RM-23A for R-18.
- This is a New JPM.
 - Failure to properly perform this task will result in possible release of radioactive liquid to the river beyond allowable limits.
- h. NA for SRO-U

In Plant JPMs

- i. **Locally Start 32 Auxiliary Boiler Feed Pump:** This JPM locally starts the Steam Driven Aux Feedwater Pump. During the startup the steam pressure control valve will not maintain pressure at 600 psig. The candidate will be required to control steam pressure using PCV-1139 Auto/Manual station.
- In Plant JPM
 - This is an Alternate Path JPM
 - This is a Bank JPM.
 - Failure to properly perform this task will result in inability to control SG level during a control room evacuation.
- j. NA for SRO-U.

- k. **Perform Local Containment Isolation Valve Lineup IVSW (SOP-CB-11 steps 1-5).**
This JPM isolates lines that penetrate containment when equipment is shutdown during a post-accident condition. The candidate will be required to locate and simulate opening/closing valves and circuit breakers for containment isolation valves.
- In Plant JPM
 - This a New JPM.
 - Failure to properly perform this task will result in inability to maintain RCS inventory and possible core damage.

Facility: Indian Point Unit 3Date of Examination: October 4, 2010Examination Level: RO ☐ **SRO-I X**

Operating Test Number: _____

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N, R	Review a gross leakrate determination calculation 2.1.7 (4.7) Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretations
Conduct of Operations	M, R,	Review Reactor Vessel Venting Time Per FR-I.3, Attachment 4 2.1.25 (4.2) Ability to interpret reference materials, such as graphs, curves, tables, etc.
Equipment Control	N, R	Review a Safety Function Determination 2.2.37 (4.6) Ability to determine operability and/or availability of safety related equipment
Radiation Control	N, R	Review a Manual Gaseous Rad Waste Release Permit 2.3.6 (3.8) Ability to approve release permits
Emergency Procedures/Plan	M, R, P	Classify E-Plan Event and Complete Part 1 Form 2.4.38 (4.4) Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required.

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

* Type Codes & Criteria:

(C)ontrol room, (S)imulator, or Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1 ; randomly selected)

Facility: Indian Point Unit 3Date of Examination: October 4, 2010Exam Level: RO ☐ SRO-I ☒ SRO-U ☐

Operating Test No.: _____

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

System / JPM Title	Type Code*	Safety Function
a. Emergency Borate	M, A, P, S, L	1
b. Transfer to Cold Leg Recirculation	D, A, E, EN, L	2
c. Respond to a Pressurizer Controlling Channel Fail High	D	3
d. Initiate Bleed and Feed of the RCS	D, A	4-P
e. Start the Hydrogen Recombiner	N, E, L	5
f. Remove a Power Range Nuclear Instrument from Service	D	7
g. Reset R-18 Alarm Setpoint Using RM-23A	N	9
h. NA for SRO-I		

In-Plant Systems® (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

i. Locally Start 32 Auxiliary Boiler Feed Pump	D, A, E, L	4-S
j. Start a CCW Pump from MCC 312A	D, E, L	6
k. Perform Local Containment Isolation Valve Lineup IVSW (SOP-CB-11 steps 1-5)	N, EN, L, R	8

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

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	$\leq 9 / \leq 8 / \leq 4$
(E)mergency or abnormal in-plant	$\geq 1 / \geq 1 / \geq 1$
(EN)gineered safety feature	- / - / ≥ 1 (control room system)
(L)ow-Power / Shutdown	$\geq 1 / \geq 1 / \geq 1$
(N)ew or (M)odified from bank including 1(A)	$\geq 2 / \geq 2 / \geq 1$
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$ (randomly selected)
(R)CA	$\geq 1 / \geq 1 / \geq 1$
(S)imulator	

^{SRO I}
INDIAN POINT UNIT 3 NRC RO EXAMINATION

CONDUCT OF OPERATIONS: Review a gross leakrate determination calculation. The candidate will be given a set of conditions and appropriate indications and a manual leakrate calculation. The candidate will review the leakrate calculation and locate errors.

- This is a New JPM
- SRO Only

CONDUCT OF OPERATIONS: Review Reactor Vessel Venting Time Per FR-1.3, Attachment

4 The candidate will be given a set of plant conditions with a void in the reactor vessel head. The candidate will be given a reactor vessel venting time calculation and directions to review calculation. The calculation is incorrect and the candidate must locate the errors.

- This is a bank JPM
- SRO Only.

EQUIPMENT CONTROL: Review a Safety Function Determination. The candidate will be given a set of plant/equipment conditions including degraded power sources and equipment failures. The candidate will be directed to Review a Safety Function Determination in accordance with OAP-034.

- This is a New JPM
- SRO Only.

RADIATION CONTROL: Review a Manual Gaseous Rad Waste Release Permit. The candidate will be given a set of plant conditions for the VC Pressure Relief and a manually prepared release permit. The candidate will be directed to review the release permit in accordance with 3-SOP-WDS-013. The candidate must locate errors on the permit.

- This is a Modified Bank JPM
- SRO Only.

EMERGENCY PROCEDURES/PLAN: Classify E-Plan Event and Complete Part 1 Form. The candidate will be given a set of plant conditions. The candidate must evaluate the conditions, determine the emergency plan classification and complete the New York State Part 1 form

- This is a Modified Bank JPM.
- This is a Time Critical JPM
- SRO Only.

- a. **Emergency Borate:** The candidate will enter the simulator following a reactor trip with 2 stuck rods. The turbine failed to automatically trip on the reactor trip resulting in a cooldown below 540°F. Emergency boration valve MOV-333 will not open. The candidate must use Attachment 1 of ONOP-CVCS-3 to establish emergency boration Using Normal Boration. The candidate must first borate for temperature and then borate for the additional stuck rod.
- This is an Alternate Path JPM.
 - This is a Modified Bank JPM
 - Failure to properly perform this task will result in possible inadequate shutdown margin.
- b. **Transfer to Cold Leg Recirculation:** The candidate will enter the simulator following a large break LOCA. The RWST will be at the level requiring transfer to cold leg recirculation. The candidate will be directed to establish cold leg recirculation using 3-ES-1.3. The recirculation pumps will not start and the candidate will be required to establish recirculation using the RHR pumps
- This is a bank JPM.
 - Failure to properly perform this JPM will result in inadequate cooling of the core and possible core damage.
- c. **Respond to a Pressurizer Controlling Pressure Channel Failure High:** The candidate will enter the simulator at normal full power lineup. The controlling pressurizer pressure channel will fail resulting in maximum spray flow and pressurizer pressure decreasing rapidly. The candidate must take manual control of the master pressurizer pressure controller and stabilize pressure. The candidate must then take appropriate actions to trip bistables associated with pressurizer pressure.
- This is a bank JPM.
 - Failure to properly perform this task will result in a reactor trip.
- d. **Initiate Bleed and Feed of the RCS:** The candidate will enter the simulator with the plant tripped. The candidate will be informed that a transition to 3-FR-H.1, Loss of Secondary Heat Sink, has been entered and conditions are met to establish Bleed and Feed cooling of the RCS. The candidate will be directed to establish Bleed and Feed Cooling. One PORV will not open and the candidate will be required to install the head vent fuses and open all head vents.
- This is an Alternate Path JPM.
 - This JPM directly from the JPM bank; however, it has not been used on the previous 2 NRC Exams.
 - Failure to properly perform this task will result in inadequate core cooling and fuel damage.
- e. **Start a Hydrogen Recombiner:** The candidate will enter the simulator following simulated a large break LOCA. The plant will be lined up for cold leg recirculation near the end of 3-ES-1.3, Transfer to Cold Leg Recirculation. The hydrogen concentration has been determined to be approximately 2%. The candidate will be directed to place the hydrogen recombiner in service using 3-SOP-CB-007. (NOTE: The hydrogen recombiner panel is a separate panel and it is not modeled in the simulator computer. This JPM will be simulated).
- This is a New JPM.
 - Failure to properly perform this task will result in excessive hydrogen buildup in the containment building.

- f. **Remove a Power Range Nuclear Instrument from Service:** The candidate will enter the simulator at any power level. The candidate will be told that one Power Range NI channel is indicating erratically and the Shift Manager has declared the channel inoperable. The candidate will be directed to remove the Power Range Channel from service in accordance with 3-SOP-NI-001.
- This is a bank JPM.
 - Failure to properly perform this task will result in a Tech Spec violation.
- g. **Reset R-18 Alarm Setpoint Using RM-23A:** The candidate will enter the simulator at any power level. The candidate will be directed to reset the Alarm setpoint for R-18, Liquid Rad Waste Release Monitor. The candidate will be told that the Bantam 11 computer system is OOS and the setpoint must be changed using the RM-23A for R-18.
- This is a New JPM.
 - Failure to properly perform this task will result in possible release of radioactive liquid to the river beyond allowable limits.
- h. **NA for SRO I**

In Plant JPMs

- i. **Locally Start 32 Auxiliary Boiler Feed Pump:** This JPM locally starts the Steam Driven Aux Feedwater Pump. During the startup the steam pressure control valve will not maintain pressure at 600 psig. The candidate will be required to control steam pressure using PCV-1139 Auto/Manual station.
- In Plant JPM
 - This is an Alternate Path JPM
 - This is a Bank JPM.
 - Failure to properly perform this task will result in inability to control SG level during a control room evacuation.
- j. **Start a CCW Pump from MCC 312A:** This JPM locally starts a CCW pump from outside the control room due to a control room evacuation. Loads must be stripped from the MCC that supplies the Appendix R MCC.
- In Plant JPM
 - This is a Bank JPM.
 - Failure to properly perform this task will result in loss of cooling to the RCP seals
- k. **Perform Local Containment Isolation Valve Lineup IVSW (SOP-CB-11 steps 1-5).** This JPM isolates lines that penetrate containment when equipment is shutdown during a post-accident condition. The candidate will be required to locate and simulate opening/closing valves and circuit breakers for containment isolation valves.
- In Plant JPM
 - This a New JPM.
 - Failure to properly perform this task will result in inability to maintain RCS inventory and possible core damage.

Facility: Indian Point Unit 3Date of Examination: October 4, 2010Examination Level: **RO** ☒ **SRO** ☐

Operating Test Number: _____

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N, R	Calculate a Power Reduction Reactivity Plan per POP-2.1 2.1.43 (4.1) Ability to use procedures to determine the effects on reactivity of plant changes, such as reactor coolant system temperature, secondary plan, fuel depletion, etc..
Conduct of Operations	M, R	Determine Reactor Vessel Venting Time Per FR-I.3, Attachment 4 2.1.25 (3.9) Ability to interpret reference materials, such as graphs, curves, tables, etc.
Equipment Control	M, R	Perform a Peer Review of a Surveillance Test 2.2.21 (2.9) Knowledge of pre- and post-maintenance operability requirements
Radiation Control	N, R	Perform a SG Tube Leakrate Determination using 3-AOP-SG-1 2.3.5 (2.9) Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.
Emergency Procedures/Plan	na	NA for ROs

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

* Type Codes & Criteria:

(C)ontrol room, (S)imulator, or Class(R)oom
 (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
 (N)ew or (M)odified from bank (≥ 1)
 (P)revious 2 exams (≤ 1 ; randomly selected)

Facility: Indian Point Unit 3Date of Examination: October 4, 2010Exam Level: **RO** ☒ SRO-I ☐ SRO-U ☐

Operating Test No.: _____

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

System / JPM Title	Type Code*	Safety Function
a. Emergency Borate	M, A, S, L	1
b. Transfer to Cold Leg Recirculation	D, A, EN, L	2
c. Respond to a Pressurizer Controlling Pressure Channel Failure High	D	3
d. Initiate Bleed and Feed of the RCS	D, A	4-P
e. Start the Hydrogen Recombiner	N, L	5
f. Remove a Power Range Nuclear Instrument from Service	D	7
g. Reset R-18 Alarm Setpoint Using RM-23A	N	9
h. Transfer buses 1 – 4 to the Station Aux Transformer	N	6

In-Plant Systems® (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

i. Locally Start 32 Auxiliary Boiler Feed Pump	D, A, E, L	4-S
j. Start a CCW Pump from MCC 312A	D, E, L	6
k. Perform Local Containment Isolation Valve Lineup IVSW (SOP-CB-11 steps 1-5)	N, EN, L, R	8

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

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	$\leq 9 / \leq 8 / \leq 4$
(E)mergency or abnormal in-plant	$\geq 1 / \geq 1 / \geq 1$
(EN)gineered safety feature	- / - / ≥ 1 (control room system)
(L)ow-Power / Shutdown	$\geq 1 / \geq 1 / \geq 1$
(N)ew or (M)odified from bank including 1(A)	$\geq 2 / \geq 2 / \geq 1$
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$ (randomly selected)
(R)CA	$\geq 1 / \geq 1 / \geq 1$
(S)imulator	

INDIAN POINT UNIT 3 NRC RO EXAMINATION**CONDUCT OF OPERATIONS: Calculate a Power Reduction Reactivity Plan per POP 2.1.**

The candidate will be given appropriate graphs and tables and directed to calculate a reactivity plan for a power reduction from 100% to 75% power.

- This is a New JPM
- RO Only

CONDUCT OF OPERATIONS: Determine Reactor Vessel Venting Time Per FR-I.3,

Attachment 4. The candidate will be given a set of plant conditions with a void in the reactor vessel head. The candidate will be given directions to calculate the reactor vessel venting time in accordance with Functional Restoration Procedure FR-I.3

- This is a bank JPM

EQUIPMENT CONTROL: Perform a Peer Review of a Surveillance Test. The candidate will be given a completed Surveillance Test and directed to perform a Peer Review. The Surveillance Test will have inaccurate information

- This is a New JPM
- RO Only

RADIATION CONTROL: Perform a SG Tube Leakrate Determination using 3-AOP-SG-1.

The candidate will be given Radiation Monitor and the worksheet from 3-AOP-SG-1 and directed to calculate SG Tube leakage.

- This is a New JPM
- RO Only.

- a. **Emergency Borate:** The candidate will enter the simulator following a reactor trip with 2 stuck rods. The turbine failed to automatically trip on the reactor trip resulting in a cooldown below 540°F. Emergency boration valve MOV-333 will not open. The candidate must use Attachment 1 of ONOP-CVCS-3 to establish emergency boration Using Normal Boration. The candidate must first borate for temperature and then borate for the additional stuck rod.
- This is an Alternate Path JPM.
 - This is a Modified Bank JPM
 - Failure to properly perform this task will result in possible inadequate shutdown margin.
- b. **Transfer to Cold Leg Recirculation:** The candidate will enter the simulator following a large break LOCA. The RWST will be at the level requiring transfer to cold leg recirculation. The candidate will be directed to establish cold leg recirculation using 3-ES-1.3. The recirculation pumps will not start and the candidate will be required to establish recirculation using the RHR pumps
- This is a bank JPM.
 - Failure to properly perform this JPM will result in inadequate cooling of the core and possible core damage.
- c. **Respond to a Pressurizer Controlling Pressure Channel Failure High:** The candidate will enter the simulator at normal full power lineup. The controlling pressurizer pressure channel will fail resulting in maximum spray flow and pressurizer pressure decreasing rapidly. The candidate must take manual control of the master pressurizer pressure controller and stabilize pressure. The candidate must then take appropriate actions to trip bistables associated with pressurizer pressure.
- This is a bank JPM.
 - Failure to properly perform this task will result in a reactor trip.
- d. **Initiate Bleed and Feed of the RCS:** The candidate will enter the simulator with the plant tripped. The candidate will be informed that a transition to 3-FR-H.1, Loss of Secondary Heat Sink, has been entered and conditions are met to establish Bleed and Feed cooling of the RCS. The candidate will be directed to establish Bleed and Feed Cooling. One PORV will not open and the candidate will be required to install the head vent fuses and open all head vents.
- This is an Alternate Path JPM.
 - This JPM directly from the JPM bank; however, it has not been used on the previous 2 NRC Exams.
 - Failure to properly perform this task will result in inadequate core cooling and fuel damage.
- e. **Start a Hydrogen Recombiner:** The candidate will enter the simulator following a large break LOCA. The plant will be lined up for cold leg recirculation near the end of 3-ES-1.3, Transfer to Cold Leg Recirculation. The hydrogen concentration has been determined to be approximately 2%. The candidate will be directed to place the hydrogen recombiner in service using 3-SOP-CB-007. (NOTE: The hydrogen recombiner panel is a separate panel and the actual simulator setup conditions are not required).
- This is a New JPM.
 - Failure to properly perform this task will result in excessive hydrogen buildup in the containment building.

- f. **Remove a Power Range Nuclear Instrument from Service:** The candidate will enter the simulator at any power level. The candidate will be told that one Power Range NI channel is indicating erratically and the Shift Manager has declared the channel inoperable. The candidate will be directed to remove the Power Range Channel from service in accordance with 3-SOP-NI-001.
- This is a bank JPM.
 - Failure to properly perform this task will result in a Tech Spec violation.
- g. **Reset R-18 Alarm Setpoint Using RM-23A:** The candidate will enter the simulator at any power level. The candidate will be directed to reset the Alarm setpoint for R-18, Liquid Rad Waste Release Monitor. The candidate will be told that the Bantam 11 computer system is OOS and the setpoint must be changed using the RM-23A for R-18.
- This is a New JPM.
 - Failure to properly perform this task will result in possible release of radioactive liquid to the river beyond allowable limits.
- h. **Transfer buses 1 – 4 to the Station Aux Transformer.** The candidate will enter the simulator at low power during a plant shutdown. Turbine load will be less than 40 MWe. The candidate will be directed to transfer 6.9 kV buses 1 – 4 from the Unit Aux Transformer to the Station Aux Transformer in preparation for a turbine shutdown.
- This is a New JPM.
 - Failure to properly perform this task may result in the loss of 6.9 kV buses 1 – 4.

In Plant JPMs

- i. **Locally Start 32 Auxiliary Boiler Feed Pump:** This JPM locally starts the Steam Driven Aux Feedwater Pump. During the startup the steam pressure control valve will not maintain pressure at 600 psig. The candidate will be required to control steam pressure using PCV-1139 Auto/Manual station.
- In Plant JPM
 - This is an Alternate Path JPM
 - This is a Bank JPM.
 - Failure to properly perform this task will result in inability to control SG level during a control room evacuation.
- j. **Start a CCW Pump from MCC 312A:** This JPM locally starts a CCW pump from outside the control room due to a control room evacuation. Loads must be stripped from the MCC that supplies the Appendix R MCC.
- In Plant JPM
 - This is a Bank JPM.
 - Failure to properly perform this task will result in loss of cooling to the RCP seals
- k. **Perform Local Containment Isolation Valve Lineup IVSW (SOP-CB-11 steps 1-5).** This JPM isolates lines that penetrate containment when equipment is shutdown during a post-accident condition. The candidate will be required to locate and simulate opening/closing valves and circuit breakers for containment isolation valves.
- In Plant JPM
 - This a New JPM.
 - Failure to properly perform this task will result in inability to maintain RCS inventory and possible core damage.

Facility: IPEC Unit 3

Scenario No.: 1

Op-Test No.: 1

Examiners: _____

Operators: _____

Initial Conditions:

Plant is at 46%. 31 EDG is OOS for an oil system modification.

Turnover:

Return power to 100%. 31 EDG is OOS and not expected back on this shift.

Event No.	Malfunction No.	Event Type*	Event Description
1	N/A	R(ATC) N(BOP) N(CRS)	Perform power ascension.
2	MAL- PRS006 B	I(ALL) TS(CRS)	Controlling PZR level instrument fails low causing letdown to isolate. Channel is defeated and letdown is restored.
3	MAL- CVC003	C(ALL) TS(CRS)	Letdown leak inside containment. Leak will be isolated.
4	MAL- EPS005 D	C(ALL)	480V Bus 6A fault.
5	MAL- ATS004 A/B PRS003 D	M(ALL)	Sequential loss of Main Feedwater Pumps leading to plant trip. PORV fails open, cannot be isolated.
6	MAL- SIS004A /B	C(CRS)	31 and 32 Safety Injection Pumps will not auto-start. (Neither board operator credited since either one may start pump.)
7	MAL- EPS001	C(ALL)	Station Blackout when Containment Phase A is reset.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Facility: IPEC Unit 3 Scenario No.: 2Op-Test No.: 1

Examiners: _____ Operators: _____

Initial Conditions:

Plant is at 5%. 31 Charging Pump is OOS for maintenance.

Turnover:

Come up to 10% power, then warm up the MTG and place it in service. 31 Charging Pump is OOS and not expected back on this shift.

Event No.	Malfunction No.	Event Type*	Event Description
1	N/A	R(ATC) N(CRS) N(BOP)	Perform power ascension.
2	XMT-040A	I(ALL) TS(CRS)	32 SG Pressure Channel Failure causing ADV to open.
3	MAL-CCW001A/B	C(CRS) C(BOP) TS(CRS)	31 CCW Pump trips and 32 CCW fails to auto-start.
4	MAL-CCW005A	TS(CRS)	CCW leak at 31 CCW Pump. Can be isolated
5	MAL-MSS009A	C(CRS) C(ATC)	Main Steam header break with no MSIVs auto-closing and 1 MSIV failing open.
6	MAL-RPS002A/B	M(ALL)	Failure of the Reactor to trip both Auto and Manual. Team will emergency borate and manually insert control rods.
7	MAL-CNM001/2	C(BOP)	Containment Sump Pump Isolation Valves fail to close requiring manual action.

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

Facility: IPEC Unit 3 Scenario No.: 3Op-Test No.: 1

Examiners: _____ Operators: _____

Initial Conditions:

Plant is at 100%. 31 AFW Pump is OOS due to high vibrations. PORV 455C is inoperable due to blowing fuses.

Turnover:

Maintain 100% power conditions. 31 AFW Pump is OOS due to high vibrations. PORV 455C is inoperable due to blowing fuses.

Event No.	Malf. No.	Event Type*	Event Description
1	XMT-CVC049	I(ALL)	VCT level instrument fails low.
2	MAL-CVC005C	C(ALL) TS(CRS)	33 Charging Pump Trip.
3	MAL-SGN005C	C(CRS) C(BOP) TS(CRS)	900 gpd SGTL on 33 SG.
4		R(ATC) N(CRS) N(BOP)	Tech Spec required shutdown.
5	MAL-SGN005C MAL-PRS003D SWI-AIR002C	M(ALL)	SGTL becomes SGTR. PORV and Instrument Air to VC Valve failures will lead to loss of pressure control.
6	MAL-CFW001C	C(CRS) C(ATC)	33 AFW Pump fails to auto-start.
7	MAL-SIS004A	C(BOP)	31 Safety Injection Pump fails to auto-start.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			