

Facility Name:		Date of Exam:															
Tier	Group	RO K/A Category Points											Total	SRO-Only Points			
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *		A 2	G *	Total	
1. Emergency & Abnormal Plant Evolutions	1	3	3	3				3	3				3	18	4	2	6
	2	1	1	2	N/A			2	2	N/A			1	9	4	0	4
	Tier Totals	4	4	5				5	5				4	27	8	2	10
2. Plant Systems	1	3	2	2	3	2	2	2	4	4	2	2	28	3	2		5
	2	1	1	1	2	1	0	1	0	1	1	1	10	0	2	1	3
	Tier Totals	4	3	3	5	3	2	3	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		3		2			1	2	2	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 Section D.1.b of ES-401 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. Refer to Section D.1.b of ES-401 for the applicable K/As.
- 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.
- For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

ES-401 PWR Examination Outline Form ES-401-2									
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO)									
Q#	E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR #
1	000007 Reactor Trip - Stabilization - Recovery / 1	0 2						Shutdown margin	3.4 1
2	000008 Pressurizer Vapor Space Accident / 3				0 8			PRT level pressure and temperature	3.8 1
3	000009 Small Break LOCA / 3					1 4		Actions to be taken if PTS limits are violated	3.8 1
4	000011 Large Break LOCA / 3					0 3		Consequences of managing LOCA with loss of CCW	3.7 1
5	000015 RCP Malfunctions / 4 000017 RCP Malfunctions (Loss of RC Flow) / 4						02. 22	Knowledge of limiting conditions for operations and safety limits.	4.0 1
	000022 Loss of Rx Coolant Makeup / 2								0
6	000025 Loss of RHR System / 4		0 1					RHR heat exchangers	2.9 1
7	000026 Loss of Component Cooling Water / 8				0 6			Control of flow rates to components cooled by the CCWS	2.9 1
8	000027 Pressurizer Pressure Control System Malfunction / 3		0 3					Controllers and positioners	2.6 1
9	000029 ATWS / 1	0 1						Reactor nucleonics and thermo-hydraulics behavior	2.8 1
	000038 Steam Gen. Tube Rupture / 3								0
10	000040 Steam Line Rupture - Excessive Heat Transfer / 4			0 6				Containment temperature and pressure considerations	3.4 1
	WE12 Uncontrolled Depressurization of all Steam Generators / 4								
	000054 (CE/E06) Loss of Main Feedwater / 4								0
11	000055 Station Blackout / 6			0 2				Actions contained in EOP for loss of offsite and onsite power	4.3 1
12	000056 Loss of Off-site Power / 6					1 7		Operational status of PZR backup heaters	3.4 1
	000057 Loss of Vital AC Inst. Bus / 6								0
13	000058 Loss of DC Power / 6				0 3			Vital and battery bus components	3.1 1
14	000062 Loss of Nuclear Svc Water / 4			0 2				The automatic actions (alignments) within the nuclear service water resulting from the actuation of the ESFAS	3.6 1
15	000065 Loss of Instrument Air / 8						04. 11	Knowledge of abnormal condition procedures.	4.0 1
	WE04 LOCA Outside Containment / 3								0
16	WE11 Loss of Emergency Coolant Recirc. / 4						04. 20	Knowledge of the operational implications of EOP warnings, cautions, and notes.	3.8 1
17	BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4	0 3						Annunciators and conditions indicating signals, and remedial actions associated with the Loss of Secondary Heat Sink	3.9 1
18	000077 Generator Voltage and Electric Grid Disturbances / 6		0 7					Turbine / generator control	3.6 1
K/A Category Totals:		3	3	3	3	3	3	Group Point Total:	18

ES-401		PWR Examination Outline							Form ES-401-2	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO)										
Q#	E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
19	000001 Continuous Rod Withdrawal / 1					03		Proper actions to be taken if automatic safety functions have not taken place	4.5	1
20	000003 Dropped Control Rod / 1	03						Relationship of reactivity and reactor power to rod movement	3.5	1
	000005 Inoperable/Stuck Control Rod / 1									0
21	000024 Emergency Boration / 1			02				Actions contained in EOP for emergency boration	4.2	1
	000026 Pressurizer Level Malfunction / 2									0
	000032 Loss of Source Range NI / 7									0
	000033 Loss of Intermediate Range NI / 7									0
	000036 Fuel Handling Accident / 8									0
22	000037 Steam Generator Tube Leak / 3				01			Maximum controlled depressurization rate for affected S/G	3.7	1
	000051 Loss of Condenser Vacuum / 4									0
	000059 Accidental Liquid RadWaste Rel. / 9									0
	000060 Accidental Gaseous Radwaste Rel. / 9									0
	000061 ARM System Alarms / 7									0
	000067 Plant Fire On-site / 8									0
	000068 Control Room Evac. / 8									0
23	000069 Loss of CTMT Integrity / 5		03					Personnel access hatch and emergency access hatch	2.8	1
	W/E14 High Containment Pressure / 5									
24	000074 Inad. Core Cooling / 4				06			RCPS	3.6	1
	W/E06 Degraded Core Cooling / 4									
	W/E07 Saturated Core Cooling / 4									
25	000076 High Reactor Coolant Activity / 9			06				Actions contained in EOP for high reactor coolant activity	3.2	1
	W/E01 Rediagnosis / 3									
26	W/E02 SI Termination / 3					02		Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.5	1
27	W/E13 Steam Generator Over-pressure / 4						04.35	Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects.	3.8	1
	W/E15 Containment Flooding / 5									0
	W/E16 High Containment Radiation / 9									0
	W/E03 LOCA Cooledown - Depress. / 4									0
	W/E09 Natural Circulation Operations / 4									0
	W/E10 Natural Circulation with Steam Void in Vessel with/without RVLIS. / 4									0
	W/E08 RCS Overcooling - PTS / 4									0
K/A Category Totals:		1	1	2	2	2	1	Group Point Total:		9

ES-401		PWR Examination Outline												Form ES-401-2	
Plant Systems - Tier 2/Group 1 (RO)															
Q#	System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
28,49	003 Reactor Coolant Pump					04		02					Effects of RCP shutdown on secondary parameters, such as steam pressure, steam flow, and feed flow; RCP pump and motor bearing temperatures	3.2; 2.9	2
29,50	004 Chemical and Volume Control				04					15			Manual/automatic transfers of control; PZR pressure and temperature	3.2; 3.5	2
30	005 Residual Heat Removal	11											RWST	3.5	1
55,31	006 Emergency Core Cooling				16				13				Interlocks between RHR valves and RCS; inadvertent SIS actuation	3.2; 3.9	2
32	007 Pressurizer Relief/Quench Tank										09		Relationships between PZR level and changing levels of the PRT and bleed holdup tank	2.5	1
33	008 Component Cooling Water		02										CCW pump, including emergency backup	3.0	1
34	010 Pressurizer Pressure Control									02			PZR pressure	3.6	1
51,35	012 Reactor Protection								02			0132	Loss of instrument power; Ability to explain and apply system limits and precautions.	3.6; 3.8	2
36	013 Engineered Safety Features Actuation			01									Fuel	4.4	1
37	022 Containment Cooling				03								Automatic containment isolation	3.6	1
	025 Ice Condenser														0
38	026 Containment Spray							06					Containment spray pump cooling	2.7	1
39	039 Main and Reheat Steam					05							Bases for RCS cooldown limits	2.7	1
40	059 Main Feedwater								04				Feeding a dry S/G	2.9	1
52,41	061 Auxiliary/Emergency Feedwater	04					02						RCS; Pumps	3.9; 2.6	2
42	062 AC Electrical Distribution										01		All breakers (including available switchyard)	3.3	1
43	063 DC Electrical Distribution		01										Major DC loads	2.9	1
44,53	064 Emergency Diesel Generator						08					0434	Fuel oil storage tanks; Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.	3.2; 4.2	2
45	073 Process Radiation Monitoring								02				Detector failure	2.7	1
46	076 Service Water			07									ESF loads	3.7	1
47,54	078 Instrument Air	02								01			Service air; Air pressure	2.7; 3.1	2
48	103 Containment									01			Containment isolation	3.9	1
															0
K/A Category Totals:		3	2	2	3	2	2	2	4	4	2	2	Group Point Total:		28

ES-401		PWR Examination Outline												Form ES-401-2	
		Plant Systems - Tier 2/Group 2 (RO)													
Q#	System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
56	001 Control Rod Drive		0 1										One-line diagram of power supply to M/G sets	3.5	1
57	002 Reactor Coolant				0 5								Detection of RCS leakage	3.8	1
58	011 Pressurizer Level Control					1 2							Criteria and purpose of PZR level program	2.7	1
	014 Rod Position Indication														0
59	015 Nuclear Instrumentation									0 4			Maximum disagreement allowed between channels	3.3	1
60	016 Non-nuclear Instrumentation			0 6									AFW System	3.5	1
	017 In-core Temperature Monitor														0
	027 Containment Iodine Removal														0
	028 Hydrogen Recombiner and Purge Control														0
	029 Containment Purge														0
61	033 Spent Fuel Pool Cooling											04 31	Knowledge of annunciator alarms, indications, or response procedures.	4.2	1
	034 Fuel Handling Equipment														0
62	035 Steam Generator	1 2											RPS	3.7	1
63	041 Steam Dump/Turbine Bypass Control						0 2						Steam pressure	3.1	1
64	045 Main Turbine Generator										0 6		Turbine stop valves	2.8	1
	055 Condenser Air Removal														0
	056 Condensate														0
	068 Liquid Radwaste														0
	071 Waste Gas Disposal														0
	072 Area Radiation Monitoring														0
	075 Circulating Water														0
	079 Station Air														0
65	086 Fire Protection				0 1								Adequate supply of water for FPS	3.1	1
K/A Category Totals:		1	1	1	2	1	0	1	0	1	1	1	Group Point Total:		10

ES-401		PWR Examination Outline							Form ES-401-2	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (SRO)										
Q#	E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
	000007 Reactor Trip - Stabilization - Recovery / 1									0
	000008 Pressurizer Vapor Space Accident / 3									0
76	000009 Small Break LOCA / 3					0 2		Possible leak paths	3.8	1
	000011 Large Break LOCA / 3									0
	000015 RCP Malfunctions / 4									0
	000017 RCP Malfunctions (Loss of RC Flow) / 4									0
	000022 Loss of Rx Coolant Makeup / 2									0
	000025 Loss of RHR System / 4									0
	000026 Loss of Component Cooling Water / 8									0
	000027 Pressurizer Pressure Control System Malfunction / 3									0
	000029 ATWS / 1									0
78	000038 Steam Gen. Tube Rupture / 3					0 9		Existence of natural circulation, using plant parameters	4.2	1
79	000040 Steam Line Rupture - Excessive Heat Transfer / 4						01 07	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.7	1
	WE12 Uncontrolled Depressurization of all Steam Generators / 4									
80	000054 (CE/E06) Loss of Main Feedwater / 4					0 3		Conditions and reasons for AFW pump startup	4.2	1
	000055 Station Blackout / 6									0
	000056 Loss of Off-site Power / 6									0
81	000057 Loss of Vital AC Inst. Bus / 6						04 01	Knowledge of EOP entry conditions and immediate action steps.	4.8	1
	000058 Loss of DC Power / 6									0
	000062 Loss of Nuclear Svc Water / 4									0
	000065 Loss of Instrument Air / 8									0
77	W/E04 LOCA Outside Containment / 3					0 1		Facility conditions and selection of appropriate procedures during abnormal and emergency operations	4.3	1
	W/E11 Loss of Emergency Coolant Recirc. / 4									0
	BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4									0
	000077 Generator Voltage and Electric Grid Disturbances / 6									0
K/A Category Totals:		0	0	0	0	4	2	Group Point Total:		6

ES-401		PWR Examination Outline							Form ES-401-2	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (SRO)										
Q#	E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
	000001 Continuous Rod Withdrawal / 1									0
	000003 Dropped Control Rod / 1									0
82	000005 Inoperable/Stuck Control Rod / 1					03		Required actions if more than one rod is stuck or inoperable	4.4	1
	000024 Emergency Boration / 1									0
83	000028 Pressurizer Level Malfunction / 2					08		PZR level as a function of power level	3.5	1
	000032 Loss of Source Range NI / 7									0
	000033 Loss of Intermediate Range NI / 7									0
	000036 Fuel Handling Accident / 8									0
	000037 Steam Generator Tube Leak / 3									0
	000051 Loss of Condenser Vacuum / 4									0
	000059 Accidental Liquid RadWaste Rel. / 9									0
	000060 Accidental Gaseous Radwaste Rel. / 9									0
	000061 ARM System Alarms / 7									0
85	000067 Plant Fire On-site / 8					15		Requirements for establishing a fire watch	3.9	1
	000068 Control Room Evac. / 8									0
	000069 Loss of CTMT Integrity / 5									0
	W/E14 High Containment Pressure / 5									0
	000074 Inad. Core Cooling / 4									0
84	W/E06 Degraded Core Cooling / 4					02		Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	4.1	1
	W/E07 Saturated Core Cooling / 4									0
	000076 High Reactor Coolant Activity / 9									0
	W/E01 Rediagnosis / 3									0
	W/E02 SI Termination / 3									0
	W/E13 Steam Generator Over-pressure / 4									0
	W/E15 Containment Flooding / 5									0
	W/E16 High Containment Radiation / 9									0
	W/E03 LOCA Cutdown - Depress. / 4									0
	W/E09 Natural Circulation Operations / 4									0
	W/E10 Natural Circulation with Steam Volde in Vessel with/without RVLIS. / 4									0
	W/E08 RCS Overcooling - PTS / 4									0
K/A Category Totals:		0	0	0	0	4	0	Group Point Total:		4

ES-401		PWR Examination Outline											Form ES-401-2		
Plant Systems - Tier 2/Group 1 (SRO)															
Q#	System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
86	003 Reactor Coolant Pump								0				Effects of VCT pressure on RCP seal leakoff flows	2.8	1
	004 Chemical and Volume Control								5						0
87	005 Residual Heat Removal											02	Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.	4.2	1
	006 Emergency Core Cooling											25			0
	007 Pressurizer Relief/Quench Tank														0
88	008 Component Cooling Water								0				Results of excessive exit temperature from the letdown cooler, including the temperature effects on ion-exchange resins	2.8	1
	010 Pressurizer Pressure Control								9						0
	012 Reactor Protection														0
	013 Engineered Safety Features Actuation														0
	022 Containment Cooling														0
	025 Ice Condenser														0
89	026 Containment Spray								0				Failure of chemical addition tanks to inject	4.1	1
	039 Main and Reheat Steam								5						0
	059 Main Feedwater														0
90	061 Auxiliary/Emergency Feedwater											04	Knowledge of the specific bases for EOPs.	4.0	1
	062 AC Electrical Distribution											18			0
	063 DC Electrical Distribution														0
	064 Emergency Diesel Generator														0
	073 Process Radiation Monitoring														0
	076 Service Water														0
	078 Instrument Air														0
	103 Containment														0
															0
K/A Category Totals:		0	0	0	0	0	0	0	3	0	0	2	Group Point Total:		5

ES-401		PWR Examination Outline												Form ES-401-2	
Plant Systems - Tier 2/Group 2 (SRO)															
Q#	System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
	001 Control Rod Drive														0
	002 Reactor Coolant														0
	011 Pressurizer Level Control														0
	014 Rod Position Indication														0
91	015 Nuclear Instrumentation							8	1				Power supply loss or erratic operation	3.9	1
	016 Non-nuclear Instrumentation														0
	017 In-core Temperature Monitor														0
	027 Containment Iodine Removal														0
	028 Hydrogen Recombiner and Purge Control														0
	029 Containment Purge														0
	033 Spent Fuel Pool Cooling														0
	034 Fuel Handling Equipment														0
92	035 Steam Generator							0	1				Faulted or ruptured S/Gs	4.6	1
	041 Steam Dump/Turbine Bypass Control														0
	045 Main Turbine Generator														0
	055 Condenser Air Removal														0
	056 Condensate														0
	068 Liquid Radwaste														0
	071 Waste Gas Disposal														0
	072 Area Radiation Monitoring														0
	075 Circulating Water														0
	079 Station Air														0
93	086 Fire Protection											04 11	Knowledge of abnormal condition procedures.	4.2	1
K/A Category Totals:		0	0	0	0	0	0	0	2	0	0	1	Group Point Total:		3

Facility Name: _____ Date of Exam: _____

Facility Name:		Date of Exam:					
Q#	Category	K/A #	Topic	RO		SRO-Only	
				IR	#	IR	#
66	1. Conduct of Operations	2.1. 26	Knowledge of industrial safety procedures (such as rotating equipment, electrical, high temperature, high pressure, caustic, chlorine, oxygen and hydrogen).	3.4	1		
67		2.1. 03	Knowledge of shift or short-term relief turnover practices.	3.7	1		
68		2.1. 04	Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, "no-solo" operation, maintenance of active license status, 10CFR55, etc.	3.3	1		
94		2.1. 34	Knowledge of primary and secondary plant chemistry limits.			3.5	1
		2.1.					
		2.1.					
		Subtotal				3	
69	2. Equipment Control	2.2. 39	Knowledge of less than or equal to one hour Technical Specification action statements for systems.	3.9	1		
70		2.2. 37	Ability to determine operability and/or availability of safety related equipment.	3.6	1		
95		2.2. 42	Ability to recognize system parameters that are entry-level conditions for Technical Specifications.			4.6	1
96		2.2. 20	Knowledge of the process for managing troubleshooting activities.			3.8	1
		2.2.					
		2.2.					
	Subtotal				2		2
71	3. Radiation Control	2.3. 05	Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	2.9	1		
72		2.3. 14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.	3.4	1		
73		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	1		
97		2.3. 11	Ability to control radiation releases.			4.3	1
98		2.3. 04	Knowledge of radiation exposure limits under normal or emergency conditions.			3.7	1
		2.3.					
		Subtotal				3	
74	4. Emergency Procedures / Plan	2.4. 06	Knowledge of EOP mitigation strategies.	3.7	1		
75		2.4. 32	Knowledge of operator response to loss of all annunciators.	3.6	1		
99		2.4. 26	Knowledge of facility protection requirements, including fire brigade and portable fire fighting equipment usage.			3.6	1
100		2.4. 16	Knowledge of EOP implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, and severe accident management guidelines.			4.4	1
		2.4.					
		2.4.					
		Subtotal				2	
Tier 3 Point Total					10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
1/1	011 EA2.03	<p>Question 4</p> <p>Could not write a question with regard to existence of natural circulation during a Large Break LOCA as there is no natural circulation in the RCS with a large break LOCA. Replaced K/A 011 EA2.09 with K/A 011 EA2.03.</p>
1/2	003 AK1.03	<p>Question 20</p> <p>Could not write an operationally valid question for an Inoperable/Stuck Rod Xenon transient as CPNPP does not allow extended operation with an inoperable or stuck control rod. Replaced K/A 005 AK1.03 with K/A 003 AK1.03.</p>
1/2	W/E 13 G.2.4.35	<p>Question 27</p> <p>Could not write a question with regard to immediate operator actions without reference to procedures during a steam generator over-pressure event as there are no immediate operator actions which would be performed without procedure reference when addressing steam generator over-pressure. Steam generator over-pressure is a YELLOW path FRG at CPNPP. Replaced K/A W/E 13 G.2.4.49 with K/A W/E 13 G.2.4.35.</p>
2/1	003 K5.04	<p>Question 28</p> <p>Could not write an operationally valid question on the operational implications of the effects of RCP shutdown on T_{AVE} as CPNPP trips the Reactor at all times in Modes 1 and 2 when an RCP trips, thus the effects on T_{AVE} are only evaluated with respect to a reactor trip where temperature control is what is monitored versus loop variations. Replaced K/A 003 K5.03 with K/A 003 K5.04.</p>
2/1	004 K4.04	<p>Question 29</p> <p>Could not develop operationally valid distracters for the effect of a loss or malfunction on the spray/heater combination in the pressurizer to assure uniform boron concentration. Replaced K/A 004 K6.01 with K/A 004 K4.04.</p>

Tier / Group	Randomly Selected K/A	Reason for Rejection
2/1	007 A4.09	Question 32 Identified that the Recognition of a Leaking PORV or Safety Valve via PRT indications was an overlap to Question 2 which was PRZR Vapor Space Accident monitoring of the PRT pressure and temperature. Replaced K/A 007 A4.10 with K/A 007 A4.09.
2/1	061 K6.02	Question 41 Questions 41 and 52 both sampled system 061 in the K1 category. To preventing over sampling of the K1 category for auxiliary/emergency feedwater and to provide balance in the outline K6 was selected. Replaced K/A 061 K1.02 with K/A 061 K6.02.
2/2	033 G.2.4.31	Question 61 Could not write a question with regard to immediate operator actions performed without reference to procedures for the Spent Fuel Pool Cooling System as there are no immediate operator actions which would be performed without procedure reference when addressing Spent Fuel Pool Cooling system malfunctions. This is addressed in an AOP at CPNPP. Replaced K/A 033 G.2.4.49 with K/A 033 G.2.4.31.
2/2	086 K4.01	Question 65 Could not write a question as the loss or malfunction of the Fire Protection system would not affect, fire, smoke and heat detectors. Randomly sampled Fire Protection system. Replaced K/A 086 K6.04 with K/A 086 K4.01.
1/1	W/E 04 EA2.01	Question 77 Could not write an operationally valid question on calculation of expected values of flow in the RCS loop with RCP secured. CPNPP trips the Reactor at all times in Modes 1 and 2 when an RCP trips, thus the resulting loop flow is not considered procedurally as forced flow exists in the remaining three loops. Replaced K/A 015 AA2.07 with K/A W/E 04 EA2.01.

Tier / Group	Randomly Selected K/A	Reason for Rejection
1/1	054 AA2.03	<p>Question 80</p> <p>Could not write an SRO only question with regard to immediate operator actions during a loss of main feedwater event. The immediate operator actions in the AOP for a Main Feedwater pump trip are actions the ROs perform from memory at CPNPP so this is not an SRO only topic for CPNPP. Additionally, other areas which could make the question an SRO level are lacking in loss of main feedwater as nearly the entire system is non safety-related and procedure selection is at the RO knowledge level. Replaced K/A 054 G.2.4.49 with K/A 054 AA2.03.</p>
1/1	057 G.2.4.1	<p>Question 81</p> <p>Could not write a question as system limits and precautions do not apply to Station Blackout. Replaced K/A 055 G.2.1.32 with K/A 057 G.2.4.1.</p>
1/2	005 AA2.03	<p>Question 82</p> <p>Generic K/A 2.1.43 is not one of the Tier 1 and 2 generic K/As as listed in NUREG 1021 ES-401. Replaced K/A 003 G.2.1.43 with K/A 005 AA2.03.</p>
1/2	074 EA2.02	<p>Question 84</p> <p>Could not write an SRO level question on loss of condenser vacuum as this is a non safety-related system without Technical Specifications. Replaced K/A 051 G.2.4.46 with K/A 074 EA2.02.</p>
2/1	061 G.2.4.18	<p>Question 90</p> <p>Generic K/A 2.4.23 is not one of the Tier 1 and 2 generic K/As as listed in NUREG 1021 ES-401. Replaced K/A 061 G.2.4.23 with K/A 061 G.2.4.18.</p>
2/2	035 A2.01	<p>Question 92</p> <p>Could not write a Technical Specification question on Spent Fuel Pool Cooling System as there are no Technical Specifications for this system. A similar topic was sampled on Question 61. Replaced K/A 033 G.2.2.25 with K/A 035 A2.01.</p>

Tier / Group	Randomly Selected K/A	Reason for Rejection
2/2	086 G.2.4.25	Question 93 Generic K/A 2.4.25 is not one of the Tier 1 and 2 generic K/As as listed in NUREG 1021 ES-401. Replaced K/A 086 G.2.4.25 with K/A 086 G.2.4.11.
3	G.2.1.34	Question 94 Generic K/A 2.1.15 does not have a 10CFR43 tie in NUREG 1122. Replaced K/A G.2.1.15 with K/A G.2.1.34

Administrative Topics Outline

Facility: CPNPP Units 1 and 2	Date of Examination: 06/09/14
Examination Level RO <input type="checkbox"/>	Operating Test Number: NRC

Administrative Topic (see Note)	Type Code*	Describe Activity to be Performed
Conduct of Operations (RA1)	N, R	2.1.25 Ability to interpret reference materials such as graphs, curves, tables, etc. (3.9). JPM: Determine Minimum and Maximum RHR Flow Rate (RO1404).
Conduct of Operations (RA2)	M, R	2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation. (4.3) JPM: Perform a Shutdown Margin Calculation (RO1010D).
Equipment Control (RA3)	M, R	2.2.12 Knowledge of surveillance procedures (3.7). JPM: Perform a Manual Quadrant Power Tilt Ratio Calculation (RO1803D).
Radiation Control (RA4)	M, R	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). JPM: Determine Radiation Levels during Maintenance and Administrative Exposure Limit (RWT029D).
Emergency Plan	—	—

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; \leq for 4 for SROs & RO retakes)
- (N)ew or (M)odified from bank (≥ 1)
- (P)revious 2 exams (≤ 1 ; randomly selected)

Administrative Topics Outline

Facility: CPNPP Units 1 and 2		Date of Examination: 06/09/14
Examination Level	SRO <input type="checkbox"/>	Operating Test Number: NRC

Administrative Topic (see Note)	Type Code*	Describe Activity to be Performed
Conduct of Operations (SA1)	N, R	2.1.1 Knowledge of conduct of operations requirements. (4.2) JPM: Determine Technical Specification and Event Reportability (SO1005D).
Conduct of Operations (SA2)	M, R	2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation. (4.4) JPM: Perform a Shutdown Margin Calculation and Evaluate Technical Specifications (SO1002A).
Equipment Control (SA3)	M, R	2.2.12 Knowledge of surveillance procedures (4.1). JPM: Perform a Manual Quadrant Power Tilt Ratio Calculation and Evaluate Technical Specifications (SO1202C).
Radiation Control (SA4)	D, R	2.3.6 Ability to approve release permits. (3.8) JPM: Review a Gaseous Waste Release Permit (SO1039C).
Emergency Plan (SA5)	N, R	2.4.41 Knowledge of the emergency action level thresholds and classifications. (4.6) JPM: Classify an Emergency Plan Event (SO1136G).

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; \leq for 4 for SROs & RO retakes)
- (N)ew or (M)odified from bank (≥ 1)
- (P)revious 2 exams (≤ 1 ; randomly selected)

Facility:	CPNPP Units 1 and 2	Date of Examination:	06/09/14
Exam Level:	RO SRO(I) SRO (U)	Operating Test No.:	NRC
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
S-1	001 – Control Rod Drive System (RO1026A) (RO Only) Respond to Reactor Startup Continuous Rod Insertion	A, L, M, S	1
S-2	004 – Chemical and Volume Control System (RO1309A) Lower Letdown Flow and Adjust Charging Flow	N, S	2
S-3	010 – Pressurizer Pressure Control System (RO1222) Respond to a Pressurizer Spray Valve Failure	A, D, S	3
S-4	005 – Residual Heat Removal System (RO1413C) Recognize and Respond to RHR Pump Cavitation	A, EN, L, N, S	4P
S-5	061 – Auxiliary Feedwater System (RO3516A) Respond to Inadvertent Start of TDAFW Pump	A, EN, N, S	4S
S-6	064 – Emergency Diesel Generator System (RO4215B) Restore Safeguards Bus 1EA1 to Offsite Power	A, D, S	6
S-7	016 – Non-Nuclear Instrumentation System (RO1833) Respond to Feedwater Flow Instrument Failure	D, S	7
S-8	086 – Fire Protection System (RO4406C) Respond to a Fire in the Control Room	M, S	8
In-Plant Systems [®] (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)			
P-1	045 – Main Turbine Generator System (RO4217D) Align a Main Generator Vent and Purge	D, E	4S
P-2	103 – Containment System (RO2119A) Perform Containment Phase A Local Isolation	D, E, R	5
P-3	071 – Waste Gas Disposal System (RO4006) Terminate Release of Radioactive Gas	N, R	9

Facility: CPNPP 1 and 2		Date of Exam: 06/09/14		Operating Test No.: NRC														
A P P L I C A N T	E V E N T T Y P E	SCENARIOS													T O T A L	MINIMUM(*)		
		CPNPP #1			CPNPP #2			CPNPP #3										
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION							
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	R		I	U	
SRO-U1	RX	-													0	1	1	0
	NOR	4													1	1	1	1
	I/C	1,2,3													3	4	4	2
	MAJ	5													1	2	2	1
	TS	1,2,3,4													4	0	2	2
SRO-U2	RX				-										0	1	1	0
	NOR				4										1	1	1	1
	I/C				1,2,3										3	4	4	2
	MAJ				6										1	2	2	1
	TS				2,3,4										3	0	2	2
SRO-U3	RX	-			-										0	1	1	0
	NOR	4			4										2	1	1	1
	I/C	1,2,3			1,2,3										6	4	4	2
	MAJ	5			6										2	2	2	1
	TS	1,2,3,4			2,3,4										7	0	2	2
SRO-U4	RX	-			-										0	1	1	0
	NOR	4			4										2	1	1	1
	I/C	1,2,3			1,2,3										6	4	4	2
	MAJ	5			6										2	2	2	1
	TS	1,2,3,4			2,3,4										7	0	2	2

Facility: CPNPP 1 and 2		Date of Exam: 06/09/14									Operating Test No.: NRC							
A P P L I C A N T	E V E N T T Y P E	SCENARIOS													T O T A L	MINIMUM(*)		
		CPNPP #1			CPNPP #2			CPNPP #3										
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION							
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	R		I	U	
RO-1	RX		4				-							1	1	1	0	
	NOR		-				-							0	1	1	1	
	I/C		1,3,7				1,3,8							6	4	4	2	
	MAJ		5				6							2	2	2	1	
	TS		-				-							0	0	2	2	
RO-2	RX			-		-								0	1	1	0	
	NOR			4		4								2	1	1	1	
	I/C			2,6,8		2,5,7								6	4	4	2	
	MAJ			5		6								2	2	2	1	
	TS			-		-								0	0	2	2	
RO-3	RX		4				-							1	1	1	0	
	NOR		-				-							0	1	1	1	
	I/C		1,3,7				1,3,8							6	4	4	2	
	MAJ		5				6							2	2	2	1	
	TS		-				-							0	0	2	2	
RO-4	RX			-		-								0	1	1	0	
	NOR			4		4								2	1	1	1	
	I/C			2,6,8		2,5,7								6	4	4	2	
	MAJ			5		6								2	2	2	1	
	TS			-		-								0	0	2	2	
RO-5	RX		4				-							1	1	1	0	
	NOR		-				-							0	1	1	1	
	I/C		1,3,7				1,3,8							6	4	4	2	
	MAJ		5				6							2	2	2	1	
	TS		-				-							0	0	2	2	
RO-6	RX			-		-								0	1	1	0	
	NOR			4		4								2	1	1	1	
	I/C			2,6,8		2,5,7								6	4	4	2	
	MAJ			5		6								2	2	2	1	
	TS			-		-								0	0	2	2	

Instructions:	
1.	Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO <i>additionally</i> serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2.	Reactivity manipulations may be conducted under normal or <i>controlled</i> abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3.	Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

Facility:	CPNPP 1 & 2	Scenario No.:	1	Op Test No.:	June 2014 NRC
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions: 100% power MOL - RCS Boron is 924 ppm (by sample).					
Turnover: Maintain steady-state power conditions. Tornado Warning from the National Weather Service. Pressurizer Steam Space Sample is in progress by Chemistry.					
Critical Tasks: <ul style="list-style-type: none"> • Emergency Stop Train B Diesel Generator within 15 minutes of Breaker Failure in accordance with ECA-0.0A, Loss of All AC Power. (Event 6) • Isolate Reactor Coolant System Leakage Paths in accordance with ECA-0.0A, Loss of All AC Power. (Event 7) • Initiate an Operator Induced Cooldown in accordance with ECA-0.0A, Loss of All AC Power. (Event 8) 					

Event No.	Malf. No.	Event Type*	Event Description
1 +10 min	RP05D	I (RO, SRO) TS (SRO)	Reactor Coolant System Loop (1-04) Narrow Range Cold Leg Temperature Instrument (TI-441A) Fails High.
2 +20 min	RP03J	I (BOP, SRO) TS (SRO)	Main Steam Line (1-04) Pressure Transmitter (PT-544) Channel I Fails Low.
3 +30 min	RX05A	I (RO, SRO) TS (SRO)	Pressurizer Level Channel (LT-459A) Fails Low.
4 +45 min	FW14B TC09I	R (RO) N (BOP, SRO) TS (SRO)	Heater Drain Pump (1-02) Trip. Automatic Turbine Runback Failure.
5 +50 min	ED01	M (RO, BOP, SRO)	Loss of All AC Power Due to Loss of Offsite Power.
6 +50 min	EG06A EG16B	C (BOP)	Emergency Diesel Generator (1-01) Air Start Failure. Emergency Diesel Generator (1-02) Output Breaker Failure.
7 +55 min	WDR04	C (RO)	Pressurizer Steam Space Sample Valves (1/1-4165A & 1/1-4176A) Fail to Auto Close. Manual Closure of 1-HV-4165A Required.
8 +75 min	MS13A	I (BOP)	Atmospheric Relief Valve (1-01) Fails Closed due to Steam Pressure Instrument (PT-2325) Failure.

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

Actual	Target Quantitative Attributes
9	Total malfunctions (5-8)
4	Malfunctions after EOP entry (1-2)
4	Abnormal events (2-4)
1	Major transients (1-2)
1	EOPs entered/requiring substantive actions (1-2)
1	EOP contingencies requiring substantive actions (0-2)
3	Critical tasks (2-3)

Facility: CPNPP 1 & 2

Scenario No.: 2

Op Test No.: June 2014 NRC

Examiners:

Operators:

Initial Conditions: 100% power MOL - RCS Boron is 924 ppm (by sample).

Turnover: Maintain steady-state power conditions.

Critical Tasks:

- Trip Reactor Coolant Pumps within 10 minutes upon a Loss of Subcooling per EOP-0.0A, Reactor Trip or Safety Injection or EOP-1.0A, Loss of Reactor or Secondary Coolant, Foldout Pages. (Event 5)
- Initiate Cooldown of Reactor Coolant System Prior to Exiting EOS-1.2A, Post LOCA Cooldown and Depressurization. (Event 6)
- Manually Initiate Train A and Train B Safety Injection Signal Prior to Exiting EOP-0.0A, Reactor Trip or Safety Injection. (Event 7)

Event No.	Malf. No.	Event Type*	Event Description
1 +5 min	RX12	C (BOP, SRO)	Main Steam Header Pressure Transmitter (PT-507) Fails Low.
2 +15 min	RX08A	I (RO, SRO) TS (SRO)	Pressurizer Pressure Channel (PT-455) Fails High.
3 +25 min	RX04C	I (BOP, SRO) TS (SRO)	Steam Generator (1-03) Level Transmitter (LT-553) Fails High.
4 +40 min	AFP 13_89	N (RO, SRO) TS (SRO)	Fire in Auxiliary Building Fire Area AC. Centrifugal Charging Pump (1-02) Manual Start Required.
5 +45 min	RX16A RX16B	C (RO)	Power Operated Relief Valves (PCV-455A/456) Fail Open. Reactor Trip Required.
6 +50 min	RCR23	M (RO, BOP, SRO)	Power Operated Relief Valve Block Valve (1/1-8000A) Fails Open upon Breaker Trip.
7 +55 min	RP07A RP07B	C (RO)	Train A Safety Injection Fails to Automatically Actuate. Train B Safety Injection Fails to Automatically Actuate.
8 +55 min	RH01D	C (BOP)	Residual Heat Removal Pump (1-02) Safety Injection Sequencer Start Failure.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Technical Specifications			

Actual	Target Quantitative Attributes
8	Total malfunctions (5-8)
2	Malfunctions after EOP entry (1-2)
4	Abnormal events (2-4)
1	Major transients (1-2)
2	EOPs entered/requiring substantive actions (1-2)
0	EOP contingencies requiring substantive actions (0-2)
3	Critical tasks (2-3)

Facility:	CPNPP 1 & 2	Scenario No.:	3	Op Test No.:	June 2014 NRC
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions: 100% power MOL - RCS Boron is 924 ppm (by sample).					
Turnover: Maintain steady-state power conditions.					
Critical Tasks: <ul style="list-style-type: none"> • Manually Trip Reactor Due to Reactor Protection System Failure Prior to Exiting EOP-0.0A, Reactor Trip or Safety Injection. (Event 5) • Initiate Train A and/or Train B Containment Isolation Phase A due to Failure to Automatically Actuate Prior to Exiting EOP-0.0A, Reactor Trip or Safety Injection. (Event 8) • Identify and Isolate Ruptured Steam Generator Prior to Commencing an Operator Induced Cooldown per EOP-3.0A, Steam Generator Tube Rupture. (Event 6) • Initiate Cooldown of Reactor Coolant System Prior to Exiting EOP-3.0A, Steam Generator Tube Rupture. (Event 6) 					
Event No.	Malf. No.	Event Type*	Event Description		
1 +10 min	SG01A		Steam Generator (1-01) Tube Leak at 50 gpd (0.0347 gpm).		
2 +20 min	RX09A	I (RO, BOP, SRO) TS (SRO)	Main Turbine 1 st Stage Pressure Transmitter (PT-505) Fails High.		
3 +30 min	SW01B	C (BOP, SRO) TS (SRO)	Station Service Water Pump 1-02 Trip.		
4 +50 min	FW16	R (RO) N (BOP, SRO)	Lowering Condenser Vacuum Requiring Power Reduction Followed by Total Loss of Condenser Vacuum.		
5 +55 min	RP01 RP13A	I (BOP)	Automatic Reactor Trip Failure. Manual Reactor Trip Failure from CB-07.		
6 +65 min	SG01A	M (RO, BOP, SRO)	Steam Generator (1-01) Tube Rupture at 500 gpm (600 second ramp) upon Turbine Trip.		
7 +70 min	OVRDE	I (RO/BOP)	Steam Generator (1-01) Blowdown Isolation Valve (1-HS-2397) Fails to Close on Safety Injection.		
8 +70 min	RP09A RP09B	C (BOP)	Containment Isolation Phase A Train A and Train B Auto Actuation Failure.		
*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Technical Specifications					

Actual	Target Quantitative Attributes
8	Total malfunctions (5-8)
3	Malfunctions after EOP entry (1-2)
4	Abnormal events (2-4)
1	Major transients (1-2)
1	EOPs entered/requiring substantive actions (1-2)
0	EOP contingencies requiring substantive actions (0-2)
4	Critical tasks (2-3)