

Facility Name: Clinton Power Station

Date of Exam: 08/22/2011

Tier	Group	RO K/A Category Points												SRO-Only Points					
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2		G*		Total	
1. Emergency & Abnormal Plant Evolutions	1	4	4	3	N/A				3	3	N/A			3	20	3		4	7
	2	1	2	1					1	1				1	7	2	1	3	
	Tier Totals	5	6	4					4	4				4	27	5	5	10	
2. Plant Systems	1	2	3	2	3	3	2	3	2	2	2	2	26	2		3	5		
	2	2	1	1	1	1	1	1	1	1	1	1	12	0	2	1	3		
	Tier Totals	4	4	3	4	4	3	4	3	3	3	3	38	4		4	8		
3. Generic Knowledge and Abilities Categories					1		2		3		4		10	1	2	3	4	7	
					3		2		2		3			2	2	1	2		

- Note: 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 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.

ES-401		BWR Examination Outline							Form ES-401-1	
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	#
48	295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4				0 7			Nuclear boiler instrumentation system	3.1	1
53	295003 Partial or Complete Loss of AC / 6					0 4		System lineups	3.5	1
39	295004 Partial or Total Loss of DC Pwr / 6	0 4						Effect of battery discharge rate on capacity	2.8	1
58	295005 Main Turbine Generator Trip / 3	0 2						Core thermal limit considerations	3.2	1
52	295006 SCRAM / 1					0 5		Whether a reactor SCRAM has occurred	4.6	1
56	295016 Control Room Abandonment / 7						04. 50	Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	4.2	1
54	295018 Partial or Total Loss of CCW / 8						04. 18	Knowledge of the specific bases for EOPs.	3.3	1
55	295019 Partial or Total Loss of Inst. Air / 8						01. 20	Ability to interpret and execute procedure steps.	4.6	1
45	295021 Loss of Shutdown Cooling / 4			0 1				Raising reactor water level	3.3	1
43	295023 Refueling Acc / 8		0 7					Standby gas treatment/FRVS	3.6	1
	295024 High Drywell Pressure / 5									0
41	295025 High Reactor Pressure / 3	0 6						Pressure effects on reactor water level	3.5	1
57	295026 Suppression Pool High Water Temp. / 5		0 6					Suppression pool level	3.5	1
40	295027 High Containment Temperature / 5	0 3						Containment integrity: Mark-III	3.8	1
46	295028 High Drywell Temperature / 5			0 6				ADS	3.4	1
42	295030 Low Suppression Pool Wtr Lvl / 5		0 9					SPDS/ERIS/CRIDS/GDS: Plant-Specific	2.5	1
50	295031 Reactor Low Water Level / 2				0 4			High pressure core spray: Plant-Specific	4.3	1
51	295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1					0 3		SBLC tank level	4.3	1
44	295038 High Off-site Release Rate / 9		0 8					SPDS/ERIS/CRIDS/GDS: Plant-Specific	2.6	1
49	600000 Plant Fire On Site / 8				0 9			Plant fire zone panel (including detector location)	2.5	1
47	700000 Generator Voltage and Electric Grid Disturbances / 6			0 2				Actions contained in abnormal operating procedure for voltage and grid disturbances	3.6	1
	K/A Category Totals:	4	4	3	3	3	3	Group Point Total:	20	

	ES-401	BWR Examination Outline							Form ES-401-1	
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	#
63	295002 Loss of Main Condenser Vac / 3					0 1		Condenser vacuum/absolute pressure	2.9	1
	295007 High Reactor Pressure / 3									0
59	295008 High Reactor Water Level / 2	0 1						Moisture carryover	3.0	1
62	295009 Low Reactor Water Level / 2				0 4			Reactor water cleanup	2.7	1
64	295010 High Drywell Pressure / 5					02. 12		Knowledge of surveillance procedures.	3.7	1
	295011 High Containment Temp / 5									0
61	295012 High Drywell Temperature / 5			0 1				Increased drywell cooling	3.5	1
	295013 High Suppression Pool Temp. / 5									0
65	295014 Inadvertent Reactivity Addition / 1		0 5					Neutron monitoring system	4.0	1
	295015 Incomplete SCRAM / 1									0
	295017 High Off-site Release Rate / 9									0
	295020 Inadvertent Cont. Isolation / 5 & 7									0
	295022 Loss of CRD Pumps / 1									0
60	295029 High Suppression Pool Wtr Lvl / 5		0 6					SRV's and discharge piping	3.4	1
	295032 High Secondary Containment Area Temperature / 5									0
	295033 High Secondary Containment Area Radiation Levels / 9									0
	295034 Secondary Containment Ventilation High Radiation / 9									0
	295035 Secondary Containment High Differential Pressure / 5									0
	295036 Secondary Containment High Sump/Area Water Level / 5									0
	500000 High CTMT Hydrogen Conc. / 5									0
	K/A Category Totals:	1	2	1	1	1	1	Group Point Total:		7

	BWR Examination Outline														Form ES-401-1
	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	#
14	203000 RHR/LPCI: Injection Mode							0 1					Reactor water level	4.2	1
1	205000 Shutdown Cooling	0 2											Reactor water level	3.6	1
	206000 HPCI														0
	207000 Isolation (Emergency) Condenser														0
5	209001 LPCS			0 1									Reactor water level	3.8	1
3	209002 HPCS		0 2										Valve electrical power: BWR-5, 6	2.8	1
7,25	211000 SLC				0 6	0 4							Core plate differential pressure indication ; Explosive valve operation	2.6; 3.1	2
4,26	212000 RPS		0 2					0 5					Analog trip system logic cabinets; RPS bus frequency: Plant-Specific	2.7; 2.6	2
9	215003 IRM					0 3							Changing detector position	3.0	1
10,24	215004 Source Range Monitor		0 1			0 1							SRM channels/detectors ; Detector operation	2.6; 2.6	2
19	215005 APRM / LPRM										0 1		IRM/APRM recorder	3.2	1
21,23	217000 RCIC				0 7							04. 45	Alternate supplies of water; Ability to prioritize and interpret the significance of each annunciator or alarm.	3.6; 4.1	2
8,22	218000 ADS				0 4							01. 19	Insures adequate air supply to ADS valves: Plant-Specific; Ability to use plant computers to evaluate system or component status.	3.5; 3.9	2
12	223002 PCIS/Nuclear Steam Supply Shutoff						0 8						Reactor protection system	3.5	1
15	239002 SRVs								0 2				Leaky SRV	3.1	1
17	259002 Reactor Water Level Control									0 1			Runout flow control: Plant-Specific	3.0	1
11	261000 SGTS						0 9						Primary containment high pressure: Plant-Specific	3.1	1
13	262001 AC Electrical Distribution							0 1					Effect on instrumentation and controls of switching power supplies	3.1	1
18	262002 UPS (AC/DC)									0 1			Transfer from preferred to alternate source	2.8	1
16	263000 DC Electrical Distribution								0 2				Loss of ventilation during charging	2.6	1
20	264000 EDGs										0 3		Transfer of emergency control between manual and automatic	3.2	1
6	300000 Instrument Air			0 1									Containment air system	2.7	1
2	400000 Component Cooling Water	0 4											Reactor coolant system, in order to determine source (s) of RCS leakage into CCWS	2.9	1
															0
	K/A Category Totals:	2	3	2	3	3	2	3	2	2	2	2	Group Point Total:		26

ES-401		BWR Examination Outline											Form ES-401-1		
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	#
	201001 CRD Hydraulic														0
	201002 RMCS														0
35	201003 Control Rod and Drive Mechanism									0 1			Control rod position	3.7	1
	201004 RSCS														0
33	201005 RCIS							0 1					First stage shell pressure/turbine load: BWR-6	3.2	1
	201006 RWM														0
	202001 Recirculation														0
	202002 Recirculation Flow Control														0
27	204000 RWCU	0 4											Component cooling water systems	2.9	1
	214000 RPIS														0
38	215001 Traversing In-core Probe	0 2											Process computer: (Not-BWR1)	2.5	1
	215002 RBM														0
	216000 Nuclear Boiler Inst.														0
	219000 RHR/LPCI: Torus/Pool Cooling Mode														0
36	223001 Primary CTMT and Aux.										1 4		Hydrogen igniters: Plant-Specific	3.7	1
37	226001 RHR/LPCI: CTMT Spray Mode											04. 47	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference	4.2	1
	230000 RHR/LPCI: Torus/Pool Spray Mode														0
	233000 Fuel Pool Cooling/Cleanup														0
	234000 Fuel Handling Equipment														0
28	239001 Main and Reheat Steam	0 1											Main steam isolation valve solenoids	3.2	1
	239003 MSIV Leakage Control														0
29	241000 Reactor/Turbine Pressure Regulator			2 8									Low pressure stop and control valves: Plant-Specific	2.5	1
	245000 Main Turbine Gen. / Aux.														0
	256000 Reactor Condensate														0
31	259001 Reactor Feedwater					0 3							Turbine operation: TDRFP's-Only	2.8	1
	268000 Radwaste														0
	271000 Offgas														0
	272000 Radiation Monitoring														0
	286000 Fire Protection														0
34	288000 Plant Ventilation							0 3					Loss of coolant accident: Plant-Specific	3.5	1
	290001 Secondary CTMT														0
32	290003 Control Room HVAC					0 4							Fire protection: Plant-Specific	2.6	1
30	290002 Reactor Vessel Internals			0 2									Separation of fluid flow paths within the vessel	3.1	1
															0
K/A Category Totals:		2	1	1	1	1	1	1	1	1	1	1	Group Point Total:		12

ES-401		BWR Examination Outline							Form ES-401-1	
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	#
76	295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4					0 2		Neutron monitoring	3.2	1
	295003 Partial or Complete Loss of AC / 6									0
	295004 Partial or Total Loss of DC Pwr / 6									0
	295005 Main Turbine Generator Trip / 3									0
	295006 SCRAM / 1									0
	295016 Control Room Abandonment / 7									0
	295018 Partial or Total Loss of CCW / 8									0
82	295019 Partial or Total Loss of Inst. Air / 8					04. 11		Knowledge of abnormal condition procedures.	4.2	1
	295021 Loss of Shutdown Cooling / 4									0
	295023 Refueling Acc / 8									0
	295024 High Drywell Pressure / 5									0
	295025 High Reactor Pressure / 3									0
81	295026 Suppression Pool High Water Temp. / 5					04. 34		Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.	4.1	1
78	295027 High Containment Temperature / 5					0 1		Containment temperature: Mark-III	3.7	1
	295028 High Drywell Temperature / 5									0
79	295030 Low Suppression Pool Wtr Lvl / 5					04. 01		Knowledge of EOP entry conditions and immediate action steps.	4.8	1
80	295031 Reactor Low Water Level / 2					04. 09		Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.	4.2	1
77	295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1					0 1		Reactor power	4.3	1
	295038 High Off-site Release Rate / 9									0
	600000 Plant Fire On Site / 8									0
	700000 Generator Voltage and Electric Grid Disturbances / 6									0
K/A Category Totals:		0	0	0	0	3	4	Group Point Total:		7

ES-401		BWR Examination Outline						Form ES-401-1		
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	#
	295002 Loss of Main Condenser Vac / 3									0
	295007 High Reactor Pressure / 3									0
	295008 High Reactor Water Level / 2									0
	295009 Low Reactor Water Level / 2									0
	295010 High Drywell Pressure / 5									0
	295011 High Containment Temp / 5									0
	295012 High Drywell Temperature / 5									0
	295013 High Suppression Pool Temp. / 5									0
	295014 Inadvertent Reactivity Addition / 1									0
85	295015 Incomplete SCRAM / 1					0 2		Control rod position	4.2	1
	295017 High Off-site Release Rate / 9									0
	295020 Inadvertent Cont. Isolation / 5 & 7									0
83	295022 Loss of CRD Pumps / 1					0 1		Accumulator pressure	3.6	1
	295029 High Suppression Pool Wtr Lvl / 5									0
	295032 High Secondary Containment Area Temperature / 5									0
	295033 High Secondary Containment Area Radiation Levels / 9									0
	295034 Secondary Containment Ventilation High Radiation / 9									0
84	295035 Secondary Containment High Differential Pressure / 5					04. 20		Knowledge of the operational implications of EOP warnings, cautions, and notes.	4.3	1
	295036 Secondary Containment High Sump/Area Water Level / 5									0
	500000 High CTMT Hydrogen Conc. / 5									0
K/A Category Totals:		0	0	0	0	2	1	Group Point Total:		3

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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	#
88	203000 RHR/LPCI: Injection											01. 32	Ability to explain and apply system limits and precautions.	4.0	1
90	205000 Shutdown Cooling Mode											04. 41	Knowledge of the emergency action level thresholds and classifications.	4.6	1
	206000 HPCI														0
	207000 Isolation (Emergency) Condenser														0
	209001 LPCS														0
	209002 HPCS														0
	211000 SLC														0
	212000 RPS														0
	215003 IRM														0
	215004 Source Range Monitor														0
86	215005 APRM / LPRM								0 1				Power supply degraded	3.1	1
	217000 RCIC														0
	218000 ADS														0
	223002 PCIS/Nuclear Steam Supply Shutoff														0
	239002 SRVs														0
	259002 Reactor Water Level Control														0
	261000 SGTS														0
	262001 AC Electrical Distribution														0
	262002 UPS (AC/DC)														0
	263000 DC Electrical Distribution														0
89	264000 EDGs											02. 22	Knowledge of limiting conditions for operations and safety limits.	4.7	1
	300000 Instrument Air														0
87	400000 Component Cooling Water								0 3				High/low CCW temperature	3.0	1
															0
K/A Category Totals:		0	0	0	0	0	0	0	2	0	0	3	Group Point Total:		5

ES-401		BWR Examination Outline												Form ES-401-1	
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	#
91	201001 CRD Hydraulic								0 3				Power supply failures	3.1	1
	201002 RMCS														0
	201003 Control Rod and Drive Mechanism														0
	201004 RSCS														0
	201005 RCIS														0
	201006 RWM														0
	202001 Recirculation														0
	202002 Recirculation Flow Control														0
	204000 RWCU														0
93	214000 RPIS								0 2				Reactor scram	3.7	1
	215001 Traversing In-core Probe														0
	215002 RBM														0
92	216000 Nuclear Boiler Inst.											02. 37	Ability to determine operability and/or availability of safety related equipment.	4.6	1
	219000 RHR/LPCI: Torus/Pool Cooling Mode														0
	223001 Primary CTMT and Aux.														0
	226001 RHR/LPCI: CTMT Spray Mode														0
	230000 RHR/LPCI: Torus/Pool Spray Mode														0
	233000 Fuel Pool Cooling/Cleanup														0
	234000 Fuel Handling Equipment														0
	239001 Main and Reheat Steam														0
	239003 MSIV Leakage Control														0
	241000 Reactor/Turbine Pressure Regulator														0
	245000 Main Turbine Gen. / Aux.														0
	256000 Reactor Condensate														0
	259001 Reactor Feedwater														0
	268000 Radwaste														0
	271000 Offgas														0
	272000 Radiation Monitoring														0
	286000 Fire Protection														0
	288000 Plant Ventilation														0
	290001 Secondary CTMT														0
	290003 Control Room HVAC														0
	290002 Reactor Vessel Internals														0
															0
K/A Category Totals:		0	0	0	0	0	0	0	2	0	0	1	Group Point Total:		3

Facility Name: Clinton Power Station Date of Exam: 08/22/2011

Tier 3				RO		SRO-Only	
Q#	Category	K/A #	Topic	IR	#	IR	#
94	1. Conduct of Operations	2.1. 14	Knowledge of criteria or conditions that require plant-wide announcements, such as pump starts, reactor trips, mode changes, etc.			3.1	1
99		2.1. 34	Knowledge of primary and secondary plant chemistry limits.			3.5	1
		2.1.					
66		2.1. 30	Ability to locate and operate components, including local controls.	4.4	1		
67		2.1. 05	Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.	2.9	1		
75		2.1. 45	Ability to identify and interpret diverse indications to validate the response of another indicator.	4.3	1		
		Subtotal				3	
95	2. Equipment Control	2.2. 21	Knowledge of pre- and post-maintenance operability requirements.			4.1	1
100		2.2. 05	Knowledge of the process for making design or operating changes to the facility.			3.2	1
		2.2.					
		2.2.					
68		2.2. 14	Knowledge of the process for controlling equipment configuration or status.	3.9	1		
69		2.2. 23	Ability to track Technical Specification limiting conditions for operations.	3.1	1		
		Subtotal				2	
96	3. Radiation Control	2.3. 11	Ability to control radiation releases.			4.3	1
		2.3.					
		2.3.					
		2.3.					
70		2.3. 04	Knowledge of radiation exposure limits under normal or emergency conditions.	3.2	1		
71		2.3. 14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.	3.4	1		
		Subtotal				2	
97	4. Emergency Procedures / Plan	2.4. 23	Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.			4.4	1
98		2.4. 44	Knowledge of emergency plan protective action recommendations.			4.4	1
		2.4.					
72		2.4. 06	Knowledge of EOP mitigation strategies.	3.7	1		
73		2.4. 46	Ability to verify that the alarms are consistent with the plant conditions.	4.2	1		
74		2.4. 29	Knowledge of the emergency plan.	3.1	1		
		Subtotal				3	
Tier 3 Point Total					10		7