CCNPP Units 1 & 2 2008 RO Examination Outline

Facility: **CCNPP Units 1 & 2 RO EXAM** Date of Exam: **6/13/2008**

Tier	Group	RO K/A Category Points												SRO-Only Points						
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2		G*		Total
1. Emergency & Abnormal Plant Evolutions	1	3	3	3	N/A			3	3	N/A		3	18					0
	2	2	1	2				1	1			2	9					0
	Tier Totals	5	4	5				4	4			5	27					0
2. Plant Systems	1	3	2	3	3	2	2	3	3	2	2	3	28					0
	2	1	1	1	1	1	1	1	1	0	1	1	10					0
	Tier Totals	4	3	4	4	3	3	4	4	2	3	4	38					0
3. Generic Knowledge and Abilities Categories		1			2			3			4		10	1	2	3	4	0
		2			3			3			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.

CCNPP Units 1 & 2 2008 RO Examination Outline

E/APE # / Name / Safety Function	K/A Topic(s)	IR	#	Q#
000008 Pressurizer Vapor Space Accident / 3	AK3.04 RCP tripping requirements	4.2	1	Q50230
000009 Small Break LOCA / 3	EK2.03 S/Gs	3.0	1	Q50231
000015/17 RCP Malfunctions / 4	AK2.08 - CCWS	2.6	1	Q50232
000022 Loss of Rx Coolant Makeup / 2	AK1.03 – Relationship between charging flow and PZR level	3.0	1	Q50250
000025 Loss of RHR System / 4	AK2.02 – LPI or Decay Heat Removal RHR pumps	3.2*	1	Q20569
000026 Loss of Component Cooling Water / 8	AA2.02 –The cause of possible CCW loss	2.9	1	Q15864
000027 Pressurizer Pressure Control System Malfunction / 3	AA1.01 – PZR heaters, sprays, and PORVs	4.0	1	Q50251
000029 ATWS / 1	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	Q44467
000038 Steam Gen. Tube Rupture / 3	EA1.13 – Steam flow indicators	3.7*	1	Q50252
000054 (CE/E06) Loss of Main Feedwater / 4	AK1.01 – MFW line break depressurizes the S/G(similar to a steam line break)	4.1	1	Q50253
000055 Station Blackout / 6	EK1.02 – Natural circulation cooling	4.1	1	Q50254
000056 Loss of Off-site Power / 6	AK3.02- Actions contained in EOP for loss of offsite power	4.4	1	Q50255
000057 Loss of Vital AC Inst. Bus / 6	AA2.04 – ESF system panel alarm annunciators and channel status indicators	3.7	1	Q50256
000062 Loss of Nuclear Svc Water / 4	AA2.02- The cause of possible SWS loss	2.9	1	Q50474
000065 Loss of Instrument Air / 8	AK3.08 – Actions contained in EOP for loss of instrument air	3.7	1	Q50258
000077 Generator Voltage and Electric Grid Disturbances / 6	2.4.28 – Knowledge of procedures relating to a security event (non-safegaurds information)	3.2	1	Q50259
CE/E02 Reactor Trip- Stabilization – Recovery/1	EA1.1 – Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.7	1	Q20628
CE/E05 Steam Line Rupture – Excessive Heat Transfer/4	2.4.4 – Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operation procedures	4.5	1	Q50261
K/A Category Totals:	Group Point Total:		18	

CCNPP Units 1 & 2 2008 RO Examination Outline

E/APE # / Name / Safety Function	K/A Topic(s)	IR	#	Q#
000001 Continuous Rod Withdrawal / 1	2.17 – Ability to make accurate, clear and concise verbal reports	3.9	1	Q50262
000003 Dropped Control Rod / 1	AA1.05 – Reactor power – turbine power	4.1	1	Q50264
000005 Inoperable/Stuck Control Rod / 1	AK3.06 – Actions contained in EOP for inoperable/stuck control rod	3.9	1	Q50265
000032 Loss of Source Range NI / 7	AK1.01 – Effects of voltage changes on performance	2.5	1	Q50266
000036 (BW/A08) Fuel Handling Accident / 8	2.1.21 – Ability to verify the controlled procedure copy	3.5 *	1	Q50267
000037 Steam Generator Tube Leak / 3	AK1.02 – Leak rate vs pressure drop	3.5	1	Q50268
000067 Plant Fire On-site / 8	AA2.04 - The fire's extent of potential operational damage to plant equipment	3.1	1	Q50475
000074 (W/E06&E07) Inad. Core Cooling / 4	EK2.02 – PORV	3.9	1	Q50270
CE/A16 Excess RCS Leakage / 2	EK3.3 – Manipulation of controls required to obtain desired operating results during abnormal and emergency situations	3.3	1	Q50273
K/A Category Point Totals:	Group Point Total:		9	

CCNPP Units 1 & 2 2008 RO Examination Outline

System # / Name	K/A Topic(s)	IR	#	Q#
003 Reactor Coolant Pump	K6.14 – Starting requirements	2.6	1	Q50476
004 Chemical and Volume Control	K5.43 – Saturation subcooling, superheat in steam/water	3.6	1	Q50275
013 Engineered Safety Features	5.02 – Safety system logic and reliability	2.9	1	Q50276
005 Residual Heat Removal	A4.05 – Position of RWST recirculation valve (locked when not in use, continuously monitored when in use)	2.8 *	1	Q50290
012 Reactor Protective System	2.1.32 Ability to explain and apply system limits and precautions	3.8	1	Q50350
006 Emergency Core Cooling	A1.09 – Pump amperage, including start, normal and locked	2.8	1	Q50311
007 Pressurizer Relief/Quench Tank	A1.03 – Monitoring quench tank temperature	2.6	1	Q50335
008 Component Cooling Water	K3.01 – Loads cooled by CCWS	3.4	1	Q50337
008 Component Cooling Water	A4.09 – CCW temperature control valve	3.0 *	1	Q50338
010 Pressurizer Pressure Control	K2.02 – Controller for PZR spray valve	2.5	1	Q50339
012 Reactor Protection	K3.04 – ESFAS	3.8 *	1	Q50340
013 Engineered Safety Features Actuation	K6.01 – Sensors and detectors	2.7 *	1	Q50341
022 Containment Cooling	K1.02 – SEC/remote monitoring systems	3.7 *	1	Q50342
026 Containment Spray	K4.04 - Reduction of temperature and pressure in containment after a LOCA by condensing steam, to reduce radiological hazard, and protect equipment from corrosion damage (spray)	3.7	1	Q50343
026 Containment Spray	K2.02 – MOVs	2.7 *	1	Q50345
039 Main and Reheat Steam	A1.09 – Main steam line radiation monitors	2.5 *	1	Q50347
039 Main and Reheat Steam	2.1.43 – Ability to use procedure to determine the effects on reactivity of plant changes, such as reactor coolant system temperature, secondary plant, fuel depletion, etc.	4.1	1	Q50348

CCNPP Units 1 & 2 2008 RO Examination Outline

059 Main Feedwater	A2.07 – Tripping of MFW pump turbine	3.0 *	1	Q50349
059 Main Feedwater	A3.04 – Turbine driven feed pump	2.5 *	1	Q50351
061 Auxiliary/Emergency Feedwater	K3.01 – RCS	4.4	1	Q50354
062 AC Electrical Distribution	2.141 – Knowledge of the refueling process	2.8	1	Q20632
062 AC Electrical Distribution	K1.02- ED/G	4.1	1	Q50358
063 DC Electrical Distribution	K1.02 – Ac electrical system	2.7	1	Q50359
064 Emergency Diesel Generator	K4.01 – Trips while loading the ED/G(frequency, voltage, speed)	3.8	1	Q50361
073 Process Radiation Monitoring	A2.01 – Erratic or failed power supply	2.5	1	Q20392
076 Service Water	A2.01 – Loss of SWS	3.5 *	1	Q40363
078 Instrument Air	A3.01 – Air pressure	3.1	1	Q50364
103 Containment	K4.06 – Containment isolation system	3.1	1	Q50365
K/A Category Point Totals:	Group Point Total:		28	

CCNPP Units 1 & 2 2008 RO Examination Outline

System # / Name	K/A Topic(s)	IR	#	Q#
001 Control Rod Drive	K6.14- Location and interpretation of reactor trip breaker	4.0	1	Q50366
011 Pressurizer Level Control	K4.07 – Cold calibrated channel	2.9	1	Q50368
015 Nuclear Instrumentation	K2.01 – NIS channels, components, and interconnections	3.3	1	Q50369
017 In-core Temperature Monitor	K1.01 – Plant computer	3.2	1	Q50370
027 Containment Iodine Removal	K5.01 – Purpose of charcoal filters	3.1 *	1	Q50371
035 Steam Generator	A1.02 – S/G pressure	3.5	1	Q50373
041 Steam Dump/Turbine Bypass Control	K3.01 – S/G	3.2 *	1	Q50374
056 Condensate	2.4.4 - Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures	4.5	1	Q50376
071 Waste Gas Disposal	A4.09 Waste gas release rad monitors	3.3	1	Q50377
086 Fire Protection	A2.03 – Inadvertent actuation of the FPS due to circuit failure or welding	2.7	1	Q50378
K/A Category Point Totals:	Group Point Total:		10	

CCNPP Units 1 & 2 2008 RO Examination Outline

Generic Knowledge and Abilities Outline (Tier 3)

Facility: **CCNPP Units 1 & 2**		Date of Exam: **6/13/2008**			
Category	K/A #	Topic	RO		Q#
			IR	#	
1. Conduct of Operations	2.1.30	Ability to locate and operate components, including local controls.	4.4	1	Q50381
	2.1.32	Ability to explain and apply system limits and precautions.	3.8	1	Q50383
	Subtotal			2	
2. Equipment Control	2.2.22	Knowledge of limiting conditions for operations and safety limits	4.0	1	Q50385
	2.2.42	Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	3.9	1	Q50384
	2.2.44	Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.	4.2	1	Q50387
	Subtotal			3	
3. Radiation Control	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.	3.2	1	Q50388
	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	Q50389
	2.3.13	Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.	3.4	1	Q50390
	Subtotal			3	
4. Emergency Procedures / Plan	2.4.32	Knowledge of operator response to loss of all annunciators.	3.6	1	Q50395
	2.4.37	Knowledge of the lines of authority during implementation of the emergency plan.	3.0	1	Q50398
	Subtotal			2	
Tier 3 Point Total				10	

Tier / Group	Randomly Selected K/A	Reason for Rejection
1/2	0067- AA2.10	Not applicable to CCNPP
2/1	025 K4.04	Not Applicable to CCNPP

CCNPP Units 1 & 2 2008 SRO Examination Outline

Facility: **CCNPP Units 1 & 2 SRO EXAM** Date of Exam: **6/13/2008**

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	0	0	0	N/A			0	0	N/A		0 / 0	3	3	6
	2	0	0	0				0	0			0 / 0	2	2	4
	Tier Totals	0	0	0				0	0			0 / 0			10
2. Plant Systems	1	0	0	0	0	0	0	0	0	0	0	0 / 0	3	2	5
	2	0	0	0	0	0	0	0	0	0	0	0 / 0	0 / 2	1	3
	Tier Totals	0	0	0	0	0	0	0	0	0	0	0 / 0	5	3	8
3. Generic Knowledge and Abilities Categories		1			2			3			4	10	1 / 2	3 / 4	7
		0			0			0			0		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/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.

E/APE # / Name / Safety Function	K/A Topic(s)	IR	#	Q #
000007 Reactor Trip-Stabilization – Recovery /1	EA2.05 – Reactor trip first out indication	3.9	1	Q50399
000011 Large Break LOCA/3	2.2.20 – Knowledge of the process for managing troubleshooting activities	3.8	1	Q50402
000009 Small Break LOCA / 3	EA2.09- Existence of adequate natural circulation	4.3	1	Q50404
000040 Steam Line Rupture – Excessive Heat Transfer/4	2.4.9 - 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	Q20393
000058 Loss of DC Power/6	AA2.01 – That a loss of dc power has occurred, verification that substitute power sources have come on line	4.1	1	Q50407
CE/E06 Loss of Main Fedwater/4	2.4.46 - Ability to verify that the alarms are consistent with the plant conditions.	4.2	1	Q50409
K/A Category Totals:	Group Point Total:		6	

CCNPP Units 1 & 2 2008 SRO Examination Outline

E/APE # / Name / Safety Function	K/A Topic(s)	IR	#	Q#
000028 Pressurizer Level Malfunction/2	2.1.4- Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, "no-solo" operation, maintenance of active license status, 10CFR55, etc.	3.8	1	Q50499
000060 Accidental Gaseous Radwaste Release/9	AA2.04 – The effects on the power plant of isolating a given radioactive gas leak	3.4	1	Q50493
000061 ARM System Alarms/7	2.2.18 Knowledge of the process for managing maintenance activities during shutdown operations, such as risk assessments, work prioritization, etc.	3.9	1	Q50403
CE/E09 Functional Recovery	EA2.2 – Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.	4.0	1	Q50496
K/A Category Point Totals:	Group Point Total:		4	

CCNPP Units 1 & 2 2008 SRO Examination Outline

System # / Name	K/A Topic(s)	IR	#	Q#
003 Reactor Coolant Pump	A2.01 – Problems with RCP seals, especially rates of seal leak-0ff.	3.9	1	Q50432
012 Reactor Protection	A2.03 – Incorrect channel bypassing	3.7	1	Q50450
013 Engineered Safety Features Actuation	2.2.21 Knowledge of pre- and post-maintenance operability requirements.	4.1	1	Q50451
026 Containment Spray	A2.03 – Failure of ESF	4.4	1	Q50453
076 Service Water	2.2.43 Knowledge of the process used to track inoperable alarms.	3.3	1	Q50455
K/A Category Point Totals:	Group Point Total:		5	

CCNPP Units 1 & 2 2008 SRO Examination Outline

System # / Name	K/A Topic(s)	IR	#	Q#
028 Hydrogen Recombiner and Purge Control	A2.01 – Hydrogen recombiner power setting, determined by using plant data	3.6 *	1	Q50456
029 Containment Purge	A2.03 – Startup operations and the associated required valve lineups	3.1	1	Q20602
072 Area Radiation Monitoring	2.1.39 Knowledge of conservative decision making practices.	4.3	1	Q50458
K/A Category Point Totals:	Group Point Total:		3	

CCNPP Units 1 & 2 2008 SRO Examination Outline

ES-401 Generic Knowledge and Abilities Outline (Tier 3)

Facility: **CCNPP Units 1 & 2** Date of Exam: **6/13/2008**

Category	K/A #	Topic	RO IR #	SRO-Only IR	SRO-Only #
1. Conduct of Operations	2.1.25	Ability to interpret reference materials, such as graphs, curves, tables, etc.	Q50459	4.2	1
	2.1.36	Knowledge of procedures and limitations involved in core alterations.	Q50462	4.1	1
	Subtotal				2
2. Equipment Control	2.2.14	Knowledge of the process for controlling equipment configuration or status.	Q50463	4.3	1
	2.2.18	Knowledge of the process for managing maintenance activities during shutdown operations, such as risk assessments, work prioritization, etc.	Q45548	3.9	1
	Subtotal				2
3. Radiation Control	2.3.15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	Q50469	3.1	1
	Subtotal				1
4. Emergency Procedures / Plan	2.4.5	Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions.	Q25069	4.3	1
	2.4.21	Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.	Q50470	4.6	1
	Subtotal				2
Tier 3 Point Total					7

Tier / Group	Randomly Selected K/A	Reason for Rejection
NONE		N/A

ES-301 **Administrative Topics Outline** **Form ES-301-1**

Facility: CCNPP Units 1 & 2 Date of Examination: 6/16/2008
Examination Level: RO ☒ SRO ☐ Operating Test Number: 2008

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M, C	2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc. (3.9 , 4.2) Determine Power Ratio Recorder Setpoints for Loss of Plant computer.
Conduct of Operations	M, C	2.1.18 Ability to make accurate, clear, and concise logs, records, status boards, and reports. (3.6, 3.8) Determine 1 hour reportability requirements based on plant events
Equipment Control	M, S	2.2.44 Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions. (4.2 , 4.4) Determine that RCP restart criteria are met following a station blackout
Radiation Control	N, C	2.3.7 Ability to comply with radiation work permit requirements during normal or abnormal conditions. (3.5, 3.6) Determine radiological conditions for personnel exposure
Emergency Procedures/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; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)

ES-301 **Control Room/In-Plant Systems Outline** **Form ES-301-2**

CCNPP Units 1 & 2 2008 RO Walkthrough Exam Outline

Facility: CCNPP Units 1 & 2 Date of Examination: 6/16/2008

Exam Level: RO ☐ SRO-I ☐ SRO-U ☐ Operating Test No.: 2008

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. CEDS- Respond to CEA(s) Misaligned by 8 " or more	A, M, S	1
b. RCS - Respond to a loss of RCS inventory while SDC is in use	A,M,L,S	2
c. PPCS - Respond to a Pressurizer spray valve failure	A,N,S	3
d. MFW - Respond to a feedwater rupture at power	M, S	4(sec)
e. RHR - Respond to a loss of all LPSI pumps while on SDC	A, M,L, S	4(pri)
f. 480VAC - Return a 480VAC bus to service following maintenance	M,S	6
g. NIS - Calculate Tq using the excore NIs	M,S	7
h. CCW- Respond to a CCW malfunction	N,S	8
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. IA - Respond to a loss of IA while shutdown	E,D	8
j. 4160VAC - Denergize a 4KV Bus during a Control Room Evacuation	E, M	6
k. MRSS - Locally Shut MSIV due to Control Room Evacuation	E, N,R	4

@ 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	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥1 (control room system)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

ES-301 **Administrative Topics Outline** **Form ES-301-1**

Facility: CCNPP Units 1 & 2 Date of Examination: 6/16/2008

Examination Level: RO ☐ SRO ☒ Operating Test Number: 2008

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M, C	2.1.18 Ability to make accurate, clear, and concise logs, records, status boards, and reports. (3.6, 3.8) Determine 1 hour reportability requirements based on plant events
Conduct of Operations	M, C	2.1.43 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, 4.3) Review a new Power Ratio Recorder setpoint calculation
Equipment Control	N, C	2.2.36 Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations. (3.1, 4.2) Evaluate the affects of degraded equipment support on T.S.
Radiation Control	N, C	2.3.7 Ability to comply with radiation work permit requirements during normal or abnormal conditions. (3.5, 3.6) Perform a Risk assessment of an activity in the RCA
Emergency Procedures/Plan	M, S	2.4.38 Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required.(2.4, 4.4) Determine appropriate ERPIP response actions

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)

ES-301 **Control Room/In-Plant Systems Outline** **Form ES-301-2**

CCNPP Units 1 & 2 2008 SRO Walkthrough Exam Outline

Facility: CCNPP Units 1 & 2	Date of Examination: 6/16/2008
Exam Level: RO ☐ SRO-I ☐ SRO-U ☒	Operating Test No.: 2008

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. CEDS- Respond to CEA(s) Misaligned by 8" or more	A, M, S	1
b.		
c.		
e. RHR - Respond to a loss of all LPSI pumps while on SDC-ESFAS	A, M,L, S	4(pri)
g. NIS - Calculate Tq using the excore NIs	M,S	7
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i.	E,D	
j. 4160VAC - Denergize a 4KV Bus during a Control Room Evacuation	E, M	6
k. MRSS - Locally Shut MSIV due to Control Room Evacuation	E, N	4(sec)

@ 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	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥1 (control room system)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

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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. CEDS- Respond to CEA(s) Misaligned by 8" or more	A, M, S	1
b. RCS - Respond to a loss of RCS inventory while SDC is in use	A,M,L,S	2
c. PPCS - Respond to a Pressurizer spray valve failure	A,N,S	3
e. RHR - Respond to a loss of all LPSI pumps while on SDC-ESFAS	A, M,L, S	4(pri)
f. 480VAC - Return a 480VAC bus to service following maintenance	M,S	6
g. NIS - Calculate Tq using the excore NIs	M,S	7
h. CCW- Respond to a CCW malfunction	N,S	8
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. IA - Respond to a loss of IA while shutdown	E,D	8
j. 4160VAC - Denergize a 4KV Bus during a Control Room Evacuation	E, M	6
k. MRSS - Locally Shut MSIV due to Control Room Evacuation	E, N,R	4(sec)

@ 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	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥1 (control room system)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

Op-Test No.: 2008 Scenario No.: 1 Page 1 of 9

Facility: Calvert Cliffs 1 & 2 Scenario No.: 1 Op-Test No.: 2008

Examiners: _____ Operators: _____

Turnover: Unit 1 was EOL at 100% for previous 9 months 2 hours ago power was reduced to 75% power to perform valve testing which was completed SAT. 11 & 12 charging pumps are running with boron equalization in progress. CVCS makeup is aligned for direct. No equipment out of service. Instructions for the shift is to return to 100% power.

Event No.	Malf. No.	Event Type*	Event Description
		R (RO/CRO)	Raise reactor power from 75% to 100%
1	CCW002_01	C (CRO)	11 Component Cooling Pump Trip (TS CRS)
2	125V001_04	C (CRO)	22 125V DC Bus Failure
3	RCS008	C (All)	11B RCP locked rotor
4	RPS005 RPS006	M (RO)	Auto Trip Relay Failure & Manual Trip Failure
5	TG005_01	C (CRO)	Stop Valve & Control Valve Fail As-Is
6	ESFAS012	M (ALL)	SGIS A & B Failure

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

	Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes	--	--	--
1.	Total malfunctions (5–8)	/ /	6		
2.	Malfunctions after EOP entry (1–2)	/ /	1		
3.	Abnormal events (2–4)	/ /	4		
4.	Major transients (1–2)	/ /	2		
5.	EOPs entered/requiring substantive actions (1–2)	/ /	1		
6.	EOP contingencies requiring substantive actions (0–2)	/ /	1		
7.	Critical tasks (2–3)	/ /	3		

Op-Test No.: 2008 Scenario No.: 2 Page 1 of 10

Facility: Calvert Cliffs 1 & 2 Scenario No.: 2 Op-Test No.: 2008

Examiners: _____ Operators: _____

_____ _____

_____ _____

Turnover: Unit 1 is at 100% power at MOL. 12 AFW pump tagged out for repair of overspeed trip device linkage (6 hours into 18 hour maintenance window).

Event No.	Malf. No.	Event Type*	Event Description
0	AFW001_02		12 AFW Pump Failure
1	RCS026_01	I (RO)	PZR Level X Transmitter Failure (Low)
2	CEDS012_37	R (RO)	CEA 37 Drop
3	CEDS003	R (RO)	CEDS Raise Relay sticks when CEA withdrawn
4	RCS002	M (ALL)	RCS Leak of 100 GPM
5	RCS002	M (ALL)	RCS Leak increases to 200 GPM
6	Panel Override SIAS "B" Block	C (CRO)	SIAS B Block Failure
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

	Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes	--	--	--
1.	Total malfunctions (5–8)	/ /	6		
2.	Malfunctions after EOP entry (1–2)	/ /	2		
3.	Abnormal events (2–4)	/ /	4		
4.	Major transients (1–2)	/ /	2		
5.	EOPs entered/requiring substantive actions (1–2)	/ /	1		
6.	EOP contingencies requiring substantive actions (0–2)	/ /	0		
7.	Critical tasks (2–3)	/ /	2		

Op-Test No.: 2008 Scenario No.: 3 Page 1 of 11

Facility: Calvert Cliffs 1 & 2 Scenario No.: 3 Op-Test No.: 2008

Examiners: _____ Operators: _____

Turnover: Unit 1 is at 100% power, MOL equilibrium conditions. 13 HPSI pump tagged out for repair of excessive vibration during last STP O-7B (3 hours into 36 hour maintenance window) IAS LCO 3.5.2.A.

Event No.	Malf. No.	Event Type*	Event Description
1	RCS011_03	N (RO)	12A RCP 1st Stage Seal Failure
2	RPS007_02	I (CRO)	Channel B RPS Matrix Power Supply Failure (TS CRS)
3	RCS013_03	C (RO)	12A RCP 3rd Stage Seal Failure
4	N/A	R (All)	Perform Expeditious Reactor Shutdown due to 2 failed seals on 12 RCP
4	TG005	C (CRO)	CV-3 Fails As-Is
5	ESFA009	I (CRO)	Spurious CIS B Actuation
6	MS002_01	M (All)	11 S/G Tube Leak (2 Tubes)

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

	Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes	--	--	--
1.	Total malfunctions (5–8)	/ /	5		
2.	Malfunctions after EOP entry (1–2)	/ /	1		
3.	Abnormal events (2–4)	/ /	3		
4.	Major transients (1–2)	/ /	1		
5.	EOPs entered/requiring substantive actions (1–2)	/ /	1		
6.	EOP contingencies requiring substantive actions (0–2)	/ /	0		
7.	Critical tasks (2–3)	/ /	3		

Op-Test No.: 2008 Scenario No.: 4 Page 1 of 10

Facility: Calvert Cliffs 1 & 2 Scenario No.: 4 Op-Test No.: 2008

Examiners: _____ Operators: _____

Turnover: Unit 1 is at 100% power, BOL, Equilibrium Conditions. 12 AFW pump tagged out for repair of overspeed trip device linkage (6 hours into 18 hour maintenance window).

Event No.	Malf. No.	Event Type*	Event Description
0	AFW001_02		12 AFW Pump Failure
1	NI0011_01	I (RO)	Channel A NI Power Summer Failure
2	FW018_02	I (CRO)	12 FRV Controller Failure
3	SWYD002	M (ALL)	Loss of Offsite Power
5	4KV001_01	C (CRO)	11 4KV bus fault
6	AFW001_01	C(CRO)	11 AFW Pump Failure

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

	Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes	--	--	--
1.	Total malfunctions (5–8)	/ /	5		
2.	Malfunctions after EOP entry (1–2)	/ /	2		
3.	Abnormal events (2–4)	/ /	2		
4.	Major transients (1–2)	/ /	1		
5.	EOPs entered/requiring substantive actions (1–2)	/ /	1		
6.	EOP contingencies requiring substantive actions (0–2)	/ /	0		
7.	Critical tasks (2–3)	/ /	3		