

## CCNPP Units 1 & 2 2008 RO Examination Outline

Facility: <b>CCNPP Units 1 &amp; 2 RO EXAM</b>														Date of Exam: <b>6/13/2008</b>					
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 Evolution	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								
<p><b>Note:</b></p> <ol style="list-style-type: none"> <li>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).</li> <li>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 <math>\pm 1</math> 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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.</li> <li>* 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.</li> <li>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.</li> <li>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.</li> </ol>																			

## CCNPP Units 1 & 2 2008 RO Examination Outline

ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO / SRO)							Form ES-401-2	
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#	
000008 Pressurizer Vapor Space Accident / 3			X				AK3.04 RCP tripping requirements	4.2	Q50230	
000009 Small Break LOCA / 3		X					EK2.03 S/Gs	3.0	Q50231	
000015/17 RCP Malfunctions / 4		X					AK2.08 - CCWS	2.6	Q50232R	
000022 Loss of Rx Coolant Makeup / 2	X						AK1.03 – Relationship between charging flow and PZR level	3.0	Q50250R	
000025 Loss of RHR System / 4		X					AK2.02 – LPI or Decay Heat Removal RHR pumps	3.2	Q20569	
000026 Loss of Component Cooling Water / 8					X		AA2.02 –The cause of possible CCW loss	2.9	Q15864R	
000027 Pressurizer Pressure Control System Malfunction / 3				X			AA1.01 – PZR heaters, sprays, and PORVs	4.0	Q50251	
029 ATWS/1						X	2.4.31 Knowledge of annunciator alarms, indications, or response procedures.	4.2	Q50712	
000038 Steam Gen. Tube Rupture / 3				X			EA1.13 – Steam flow indicators	3.7 *	Q50252	
000054 (CE/E06) Loss of Main Feedwater / 4	X						AK1.01 – MFW line break depressurizes the S/G(similar to a steam line break)	4.1	Q50253	
000055 Station Blackout / 6	X						EK1.02 – Natural circulation cooling	4.1	Q50254	
000056 Loss of Off-site Power / 6			X				AK3.02- Actions contained in EOP for loss of offsite power	4.4	Q50255	
000057 Loss of Vital AC Inst. Bus / 6					X		AA2.04 – ESF system panel alarm annunciators and channel status indicators	3.7	Q50256	
000062 Loss of Nuclear Svc Water / 4					X		AA2.02- The cause of possible SWS loss	2.9	Q50474	
000065 Loss of Instrument Air / 8			X				AK3.08 – Actions contained in EOP for loss of instrument air	3.7	Q50258	
000077 Generator Voltage and Electric Grid Disturbances / 6						X	2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm.	4.1	Q50690	
CE/E02 Reactor Trip- Stabilization – Recovery/1				X			EA1.1 – Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.7	Q20628	
CE/E05 Steam Line Rupture- Excess Heat Transfer						X	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	Q50261	
K/A Category Totals:	3	3	3	3	3	3	Group Point Total:		18	

## CCNPP Units 1 & 2 2008 RO Examination Outline

ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO / SRO)							Form ES-401-2	
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						X	2.4.14 Knowledge of general guidelines for EOP usage.	3.8	Q50262	
000003 Dropped Control Rod / 1				X			AA1.05 – Reactor power – turbine power	4.1	Q50264	
000005 Inoperable/Stuck Control Rod / 1			X				AK3.06 – Actions contained in EOP for inoperable/stuck control rod	3.9	Q50265	
000032 Loss of Source Range NI / 7	X						AK1.01 – Effects of voltage changes on performance	2.5	Q50266R	
0036 Fuel Handling Accident						X	<b>2.4.4 Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.</b>	4.5	Q50713	
000037 Steam Generator Tube Leak / 3	X						AK1.02 – Leak rate vs pressure drop	3.5	Q50268	
000067 Plant Fire On-site / 8					X		AA2.04 - The fire's extent of potential operational damage to plant equipment	3.1	Q50475	
000074 (W/E06&E07) Inad. Core Cooling / 4		X					EK2.02 – PORV	3.9	Q50270	
CE/A 16 Excess RCS Leakage			X				EK3.3 – Manipulation of controls required to obtain desired operating results during abnormal and emergency situations	3.3	Q50273	
K/A Category Point Totals:	2	1	2	1	1	2	Group Point Total:	9		

## CCNPP Units 1 & 2 2008 RO Examination Outline

ES-401		PWR Examination Outline Plant Systems - Tier 2/Group 1 (RO / SRO)											Form ES-401-2		
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	#	
003 Reactor Coolant Pump						X						K6.14 – Starting requirements	2.6	Q50476	
004 Chemical and Volume Control					X							K5.43 – Saturation subcooling, superheat in steam/water	3.6	Q50275	
013 Engineered Safety Features					X							5.02 – Safety system logic and reliability	2.9	Q50276	
005 Residual Heat Removal										X		A4.05 – Position of RWST recirculation valve (locked when not in use, continuously monitored when in use)	2.8 *	Q50290	
012 Reactor Protective System											X	2.1.32 – Ability to explain and apply system limits and precautions.	3.8	Q50350	
006 Emergency Core Cooling							X					A1.17 ECCS flow rate	4.2	Q50613	
007 Pressurizer Relief/Quench Tank							X					A1.03 – Monitoring quench tank temperature	2.6	Q50336	
008 Component Cooling Water			X									K3.01 – Loads cooled by CCWS	3.4	Q50337	
008 Component Cooling Water										X		A4.09 – CCW temperature control valve	3.0 *	Q50338R	
010 Pressurizer Pressure Control		X										K2.02 – Controller for PZR spray valve	2.5	Q50339	
012 Reactor Protection			X									K3.04 – ESFAS	3.8 *	Q50340	
013 Engineered Safety Features Actuation						X						K6.01 – Sensors and detectors	2.7 *	Q50341R	
022 Containment Cooling	X											K1.02 – SEC/remote monitoring systems	3.7 *	Q50342	
026 Containment Spray				X								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	Q50343	
026 Containment Spray		X										K2.02 – MOVs	2.7 *	Q50345	
039 Main and Reheat Steam							X					A1.09 – Main steam line radiation monitors	2.5 *	Q50347	
039 Main and Reheat Steam											X	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	Q50348	

### CCNPP Units 1 & 2 2008 RO Examination Outline

059 Main Feedwater									X				A2.07 – Tripping of MFW pump turbine	3.0 *	Q50349
059 Main Feedwater										X			A3.04 – Turbine driven feed pump	2.5 *	Q50351
061 Auxiliary/Emergency Feedwater			X										K3.01 – RCS	4.4	Q50354
062 AC Electrical Distribution												X	2.141 – Knowledge of the refueling process	2.8	Q50614
062 AC Electrical Distribution	X												K1.02- ED/G	4.1	Q50358
063 DC Electrical Distribution	X												K1.02 – Ac electrical system	2.7	Q50359
064 Emergency Diesel Generator				X									K4.01 – Trips while loading the ED/G(frequency, voltage, speed)	3.8	Q50361
073 Process Radiation Monitoring									X				A2.01 – Erratic or failed power supply	2.5	Q20392
076 Service Water									X				A2.01 – Loss of SWS	3.5 *	Q50363R
078 Instrument Air										X			A3.01 – Air pressure	3.1	Q50364
103 Containment				X									K4.06 – Containment isolation system	3.1	Q50365
K/A Category Point Totals:	3	2	3	3	2	2	3	3	2	2	3	Group Point Total:			28

## CCNPP Units 1 & 2 2008 RO Examination Outline

ES-401		PWR Examination Outline Plant Systems - Tier 2/Group 2 (RO / SRO)											Form ES-401-2	
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						X						K6.14- Location and interpretation of reactor trip breaker	4.0	Q50366
011 Pressurizer Level Control				X								K4.07 – Cold calibrated channel	2.9	Q50368
015 Nuclear Instrumentation		X										K2.01 – NIS channels, components, and interconnections	3.3	Q50369
017 In-core Temperature Monitor	X											K1.01 – Plant computer	3.2	Q50370
027 Containment Iodine Removal					X							K5.01 – Purpose of charcoal filters	3.1 *	Q50371
035 Steam Generator							X					A1.02 – S/G pressure	3.5	Q50373
041 Steam Dump/Turbine Bypass Control			X									K3.01 – S/G	3.2 *	Q50374
056 Condensate											X	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	Q50376
071 Waste Gas Disposal										X		A4.09 Waste gas release rad monitors	3.3	Q50377R
086 Fire Protection								X				A2.03 – Inadvertent actuation of the FPS due to circuit failure or welding	2.7	Q50378
K/A Category Point Totals:	1	1	1	1	1	1	1	1		1	1	Group Point Total:	10	

## CCNPP Units 1 & 2 2008 RO Examination Outline

### Generic Knowledge and Abilities Outline (Tier 3)

Facility: <b>CCNPP Units 1 &amp; 2</b>		Date of Exam: <b>6/13/2008</b>				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.30	Ability to locate and operate components, including local controls.	4.4	Q50381R		NA
	2.1.32	Ability to explain and apply system limits and precautions	3.8	Q50383		NA
	Subtotal			2		
2. Equipment Control	2.2.22	Knowledge of limiting conditions for operations and safety limits	4.0	Q50385R		NA
	2.2.42	Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	3.9	Q50384R		NA
	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	Q50387		NA
	Subtotal			3		
3. Radiation Control	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.	3.2	Q50388		NA
	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	Q50389		NA
	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	Q50390		NA
	Subtotal			3		
4. Emergency Procedures / Plan	2.4.46	Ability to verify that the alarms are consistent with the plant conditions	4.2	Q50714		NA
	2.4.37	Knowledge of the lines of authority during implementation of the emergency plan.	3.0	Q50398		NA
	Subtotal			2		
Tier 3 Point Total				10		

## CCNPP Units 1 & 2 2008 RO Examination Outline

**ES-401**

### Record of Rejected K/As

Form ES-401-4

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## CCNPP Units 1 & 2 2008 SRO Examination Outline

Facility: <b>CCNPP Units 1 &amp; 2 SRO EXAM</b>														Date of Exam: <b>6/13/2008</b>					
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	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	
<p>Note:</p> <ol style="list-style-type: none"> <li>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).</li> <li>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 <math>\pm 1</math> 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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.</li> <li>* 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.</li> <li>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.</li> <li>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.</li> </ol>																			

# CCNPP Units 1 & 2 2008 SRO Examination Outline

ES-401

2

Form ES-401-2

ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO / SRO)							Form ES-401-2	
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					X		EA2.02 Ability to determine or interpret the following as they apply to a reactor trip: Proper actions to be taken if the automatic safety functions have not taken place		4.6	Q50652
062 Loss of Nuclear Service Water						X	2.2.20 – Knowledge of the process for managing troubleshooting activities		3.8	Q50402R
000011 Large Break LOCA/3					X		EA2.09- Existence of adequate natural circulation		4.3	Q50404
00040/Steam Line Rupture – Excessive Heat Transfer						X	2.4.6 Knowledge of EOP mitigation strategies.		4.7	Q50405
000058 Loss of DC Power/6					X		AA2.03– DC loads lost; impact on ability to operate and monitor plant systems		3.9	Q50407
CE/E06 Loss of Main Fedwater/4						X	2.4.46 - Ability to verify that the alarms are consistent with the plant conditions.		4.2	Q50409R
K/A Category Totals:					3	3	Group Point Total:			6

## CCNPP Units 1 & 2 2008 SRO Examination Outline

ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO / SRO)							Form ES-401-2	
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#	
000028 Pressurizer Level Malfunction/2						X	2.1 Knowledge of conduct of operations requirements.	4.2	Q20588	
000060 Accidental Gaseous Radwaste Release/9					X		AA2.04 – The effects on the power plant of isolating a given radioactive gas leak	3.4	Q50493	
000061 ARM System Alarms/7						X	<b>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.</b>	4.4	<u>Q50574</u>	
CE/E09 Functional Recovery					X		EA2.2 – Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.	4.0	Q50496	
K/A Category Point Totals:					2	2	Group Point Total:		4	

## CCNPP Units 1 & 2 2008 SRO Examination Outline

ES-401		PWR Examination Outline Plant Systems - Tier 2/Group 1 (RO / SRO)										Form ES-401-2		
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	#
003 Reactor Coolant Pump								X				A2.01 – Problems with RCP seals, especially rates of seal leak-Off.	3.9	Q50432
012 Reactor Protection								X				A.2.01 Ability to (a) predict the impacts of the following malfunctions or operations on the RPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Faulty Bistable operation	3.6	Q50450
013 Engineered Safety Features Actuation											X	2.2.21 Knowledge of pre- and post-maintenance operability requirements.	4.1	Q50451
026 Containment Spray								X				A2.03 – Failure of ESF	4.4	Q50453
076 Service Water											X	2.2.43 Knowledge of the process used to track inoperable alarms.	3.3	Q50455
K/A Category Point Totals:								3			2	Group Point Total:		5

## CCNPP Units 1 & 2 2008 SRO Examination Outline

ES-401		PWR Examination Outline Plant Systems - Tier 2/Group 2 (RO / SRO)											Form ES-401-2		
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	#	
028 Hydrogen Recombiner and Purge Control								X				A2.01 – Hydrogen recombinder power setting, determined by using plant data	3.6 *	Q50456	
029 Containment Purge								X				A2.01 - Ability to (a) predict the impacts of the following malfunctions or operations on the Containment Purge System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Maintenance or other activity taking place inside containment	3.1	Q20602	
072 Area Radiation Monitoring											X	2.1.39 Knowledge of conservative decision making practices.	4.3	Q50458	
K/A Category Point Totals:								2			1	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		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.25	Ability to interpret reference materials, such as graphs, curves, tables, etc.			4.2	Q50459
	2.1.36	Knowledge of procedures and limitations involved in core alterations.			4.1	Q50462
	Subtotal					2
2. Equipment Control	2.2.14	Knowledge of the process for controlling equipment configuration or status.			4.3	<u>Q50553</u>
	2.2.18	Knowledge of the process for managing maintenance activities during shutdown operations, such as risk assessments, work prioritization, etc.			3.9	Q45548R
	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.			3.4	Q50655
	Subtotal					1
4. Emergency Procedures / Plan	2.4.5	<b>Knowledge of the organization of the operating procedures network for normal, abnormal and emergency evolutions</b>			4.3	Q50653
	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.			4.6	Q50470
	Subtotal					2
Tier 3 Point Total						7

## Form ES-401-4

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## **CCNPP Units 1 & 2 2008 SRO Examination Outline**

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**CCNPP Units 1 & 2 2008 RO Walkthrough Exam Outline**

**ES-301**

**Administrative Topics Outline**

**Form ES-301-1**

Facility: <u>CCNPP Units 1 &amp; 2</u>		Date of Examination: <u>6/16/2008</u>
Examination Level: RO <input checked="" type="checkbox"/> SRO <input type="checkbox"/>		Operating Test Number: <u>2008</u>

  

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)  Calculate Tq using the excore Nis  <b>(JPM-2008-NIS)</b>
Conduct of Operations	N, C	2.1.18 Ability to make accurate, clear, and concise logs, records, status boards, and reports. (3.6, 3.8)  Determine Determine Time to Boil (TTB) for the Shift Turnover Sheet  <b>(JPM-2008-TTB)</b>
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 <b>(JPM-2008-RCP)_</b>
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  <b>(JPM-2008-RAD)_</b>
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: <u>CCNPP Units 1 &amp; 2</u>		Date of Examination: <u>6/16/2008</u>
Exam Level: RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>		Operating Test No.: <u>2008</u>

  

Control Room Systems <sup>@</sup> (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 (JPM-2008-CEDM)	M, S	1
b. RCS - Respond to a loss of RCS inventory while SDC is in use (JPM-2008-SDC-1)	A,M,L,S	2
c. PPCS - Respond to a Pressurizer spray valve failure (JPM-2008-PPCS)	A,N,S	3
d. MFW - Respond to a feedwater rupture at power (JPM-2008-MFW)	M, S	4(sec)
e. RHR - Respond to a loss of all LPSI pumps while on SDC (JPM-2008-SDC-2)	A, M,L, S	4(pri)
f. 4160VAC – Verify Vital Auxiliaries after a loss of Offsite power (JPM-2008-4160V)	A,M,S	6
g. NIS - Calculate Power Ratio recorder setpoints and adjust the potentiometers (JPM-2008-AOP7H)	M,S	7
h. CCW- Respond to a CCW malfunction (JPM-2008-CCW)	N,S	8
In-Plant Systems <sup>@</sup> (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. IA - Respond to a loss of IA while shutdown (JPM-2008-IA1)	E,D	8
j. 4160VAC – Prelube and locally start 0C D/G and energize a 4KV Bus after a severe fire (JPM-2008-4KV_0C-DG)	E, M	6
k. MRSS - Locally Shut MSIV due to Control Room Evacuation (JPM-2008-MSIV)	E, N,R	4
<p><sup>@</sup> 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.</p>		

### CCNPP Units 1 & 2 2008 RO Walkthrough Exam Outline

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

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

Operating Test Number: 2008

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

**CCNPP Units 1 & 2 2008 SRO Walkthrough Exam Outline**

Facility: <u>CCNPP Units 1 &amp; 2</u>		Date of Examination: <u>6/16/2008</u>
Exam Level: RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>		Operating Test No.: <u>2008</u>

  

Control Room Systems <sup>@</sup> (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 (JPM-2008-CEDM)	M, S	1
b. RCS - Respond to a loss of RCS inventory while SDC is in use (JPM-2008-SDC-1)	A,M,L,S	2
c. PPCS - Respond to a Pressurizer spray valve failure (JPM-2008-PPCS)	A,N,S	3
e. RHR - Respond to a loss of all LPSI pumps while on SDC-ESFAS (JPM-2008-SDC-2)	A, M,L, S	4(pri)
f. 4160VAC – Verify Vital Auxiliaries after a loss of Offsite power (JPM-2008-4160V)	A, M,S	6
g. NIS - Calculate Power Ratio recorder setpoints and adjust the potentiometers (JPM-2008-AOP7H)	M,S	7
h. CCW- Respond to a CCW malfunction (JPM-2008-CCW)	N,S	8
In-Plant Systems <sup>@</sup> (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. IA - Respond to a loss of IA while shutdown (JPM-2008-IA1)	E,D	8
j. 4160VAC – Prelube and locally start OC D/G and energize a 4KV Bus after a severe fire (JPM-2008-4KV_OC-DG)	E, M	6
k. MRSS - Locally Shut MSIV due to Control Room Evacuation (JPM-2008-MSIV)	E, N,R	4(sec)
<sup>@</sup> 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	

### CCNPP Units 1 & 2 2008 SRO Walkthrough Exam Outline

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

Facility: <u>CCNPP Units 1 &amp; 2</u>		Date of Examination: <u>6/16/2008</u>
Exam Level: RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/>		Operating Test No.: <u>2008</u>
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 (JPM-2008-CEDM)	A, M, S	1
b.		
c.		
e. RHR - Respond to a loss of all LPSI pumps while on SDC-ESFAS (JPM-2008-SDC-2)	A, M, L, S	4(pri)
g. NIS - Calculate Power Ratio recorder setpoints and adjust the potentiometers (JPM-2008-AOP7H)	M, S	7
In-Plant Systems® (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i.	E, D	
j. 4160VAC - Dennergize a 4KV Bus during a Control Room Evacuation (JPM-2008-4KV(0C-DG)	E, M	6
k. MRSS - Locally Shut MSIV due to Control Room Evacuation (JPM-2008-MSIV)	E, N	4(sec)

### CCNPP Units 1 & 2 2008 SRO Walkthrough Exam Outline

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

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

**Appendix D****Scenario Outline****Form ES-D-1**Op-Test No.: 2008 Scenario No.: 1Facility: Calvert Cliffs 1 & 2 Scenario No.: 1 Op-Test No.: 2008Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Turnover: Unit 1 was MOC at 100% for previous 6 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 are to return to 100% power at approximately 30% per hour.

Event No.	Malf. No.	Event Type*	Event Description
1		N (CRO/SRO) R (RO)	Raise reactor power from 75% to 100%
2	CCW002_01	C (CRO)	11 Component Cooling Pump Trip (TS CRS)
3	CVCS005	C (RO)	CVCS Backpressure Transmitter PT-201 Fails Low
4	125V001_04	C (SRO)	22 125V DC Bus Failure
5	RCS008_02	C (All)	11B RCP locked rotor
5	RPS005 RPS006	M (RO)	Auto Trip Relay Failure & Manual Trip Failure
6	TG005_01	C (CRO)	Stop Valve & Control Valve Fail As-Is
7	ESFAS001_02	C (RO)	SIAS B Failure
8	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)	/ /	7		
2.	Malfunctions after EOP entry (1–2)	/ /	3		
3.	Abnormal events (2–4)	/ /	5		
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		

# Appendix D

# Scenario Outline

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Form ES-D-1

Op-Test No.: 2008 Scenario No.: 3

Facility: <u>Calvert Cliffs 1 &amp; 2</u>	Scenario No.: <u>3</u>	Op-Test No.: <u>2008</u>
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	-----	12A RCP 1 <sup>st</sup> Stage Seal Failure
2	RPS007_02	I (SRO)	Channel B RPS Matrix Power Supply Failure (TS CRS)
3	RCS021	C (RO)	PORV 402 leak
4	RCS013_03	C (RO)	12A RCP 3 <sup>rd</sup> Stage Seal Failure
5	N/A	R (RO)(SRO) N(CRO)SRO	Perform Expeditious Reactor Shutdown due to 2 failed seals on 12 RCP
6	N/A	C (RO)	VCT Outlet MOV fails (1-CVC-501-MOV)
7	ESFA009	M (CRO)	Spurious CIS B Actuation
8	CD001	C (CRO)	Loss of Vacuum
9	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)	/ /	8		
2.	Malfunctions after EOP entry (1-2)	/ /	2		
3.	Abnormal events (2-4)	/ /	6		
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		

**Appendix D****Scenario Outline****Form ES-D-1**Op-Test No.: 2008 Scenario No.: 2Facility: Calvert Cliffs 1 & 2 Scenario No.: 2 Op-Test No.: 2008Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Turnover: Unit 1 is at 100% power at EOC. 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
	AFW001_02		12 AFW Pump Failure
1	RCS026_01	I/N (RO)	PZR Level X Transmitter Failure (high)
2	CEDS012_37	C (ALL)	CEA 37 Drop
3	CEDS003	R (RO) C (RO/SRO)	CEDS Raise Relay sticks when CEA withdrawn
4	Downpower	R (RO) N (CRO/SRO)	Downpower due to expiration of CEA alignment time
5	RCS002	M (ALL)	RCS Leak of 100 GPM
6	CEDS010	C (RO)	Mechanical Binding of 2 CEA's (51 & 62)
7	RCS002	M (ALL)	RCS Leak increases to 200 GPM
8	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)	/ /	7		
2.	Malfunctions after EOP entry (1–2)	/ /	3		
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		

# Appendix D

# Scenario Outline

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Form ES-D-1

Op-Test No.: 2008 Scenario No.: 4

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

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Turnover: Unit 1 is at 100% power, MOC, 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
1	Downpower	R (RO N (CRO/SRO)	TSO-SO directed downpower
2	NI0011_01	I (RO)	Channel A NI Power Summer Failure
3	CVCS004_01	C (RO)	11 Charging Pump coupling failure
4	FW018_02	I (CRO)	12 FRV Controller Failure
5	CD008	C (CRO)	Condensate header rupture
6	SWYD002	M (ALL)	Loss of Offsite Power
7	4KV001_01	C (CRO)	11 4KV bus fault
8	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)	/ /	7		
2.	Malfunctions after EOP entry (1–2)	/ /	2		
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)	/ /	2		