

Facility Name: Fort Calhoun		Date of Exam:3/30/2009															
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	2	1	4	N/A			3	6	N/A			2	18	4	2	6
	2	2	1	1	N/A			2	1	N/A			2	9	1	3	4
	Tier Totals	4	2	5	N/A			5	7	N/A			4	27	5	5	10
2. Plant Systems	1	3	2	2	3	2	1	2	4	2	3	4	28	4	1	5	
	2	1	0	2	3	1	1	0	1	0	0	1	10	0	1	3	
	Tier Totals	4	2	4	6	3	2	2	5	2	3	5	38	5	3	8	
3. Generic Knowledge and Categories	Abilities	1		2		3		4		10		1	2	3	4	7	
		2		3		3		2		10		2	1	2	2		

- Note: 1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).
2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.
3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems 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		PWR Examination Outline - Rev 2						Form ES-401-2	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO)									
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000007 Reactor Trip / 1									1
CE/E02 Reactor Trip Recovery / 1				0 2			Operating behavior characteristics of the facility.	3.3	
000008 Pressurizer Vapor Space Accident / 3			0 3				Actions contained in EOP for PZR vapor space accident/LOCA	4.1	1
000009 Small Break LOCA / 3					0 5		The time available for action before PZR is empty, given the rate of decrease of PZR level	3.4	1
000011 Large Break LOCA / 3									0
000015 RCP Malfunctions / 4						02. 22	Knowledge of limiting conditions for operations and safety limits.	4	1
000017 RCP Malfunctions (Loss of RC Flow) / 4									
000022 Loss of Rx Coolant Makeup / 2									0
000025 Loss of RHR System / 4		0 2					LPI or Decay Heat Removal/RHR pumps	3.2	1
000026 Loss of Component Cooling Water / 8						01. 23	Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.3	1
000027 Pressurizer Pressure Control System Malfunction / 3			0 4				Why, if PZR level is lost and then restored, that pressure recovers much more slowly	2.8	1
000029 ATWS / 1			0 8				Closing the main steam isolation valve	3.6	1
000038 Steam Gen. Tube Rupture / 3					0 7		Plant conditions, from survey of control room indications	4.4	1
000040 Steam Line Rupture / 4									1
CE/E05 Excessive Steam Demand / 4				0 3			Desired operating results during abnormal and emergency situations.	3.4	
000054 Loss of Main Feedwater / 4	0 2						Effects of feedwater introduction on dry S/G	3.6	1
CE/E06 Loss of Feedwater / 4									
000055 Station Blackout / 6					0 3		Actions necessary to restore power	3.9	1
000056 Loss of Off-site Power / 6	0 1						Principle of cooling by natural convection	3.7	1
000057 Loss of Vital AC Inst. Bus / 6			0 1				Actions contained in EOP for loss of vital ac electrical instrument bus	4.1	1
000058 Loss of DC Power / 6				0 1			Cross-tie of the affected dc bus with the alternate supply	3.4	1
000062 Loss of Nuclear Svc Water / 4					0 3		The valve lineups necessary to restart the SWS while bypassing the portion of the system causing the abnormal condition	2.6	1
000065 Loss of Instrument Air / 8					0 8		Failure modes of air-operated equipment	2.9	1
000077 Generator Voltage and Electric Grid Disturbances / 6					1 0		Generator overheating and the required actions	3.6	1
K/A Category Totals:	2	1	4	3	6	2	Group Point Total:		18

ES-401	PWR Examination Outline - Rev 2											Form ES-401-2		
Plant Systems - Tier 2/Group 1 (RO)														
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											01.20	Ability to interpret and execute procedure steps.	4.6	1
004 Chemical and Volume Control	29							30				Effect and detection of leaking PORV or relief on PZR level and pressure, including VCT makeup activity in automatic mode; Reduction of boron concentration in the letdown	3.4; 3.3	2
005 Residual Heat Removal						03						RHR heat exchanger	2.5	1
006 Emergency Core Cooling					04						02.37	Brittle fracture, including causes and preventative actions; Ability to determine operability and/or availability of safety related equipment.	2.9; 3.6	2
007 Pressurizer Relief/Quench Tank					02						01.07	Method of forming a steam bubble in the PZR; Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor	3.1; 4.4	2
008 Component Cooling Water										04.46		Startup of a CCW pump when the system is shut down; Ability to verify that the alarms are consistent with the plant conditions.	2.6; 4.2	2
010 Pressurizer Pressure Control										01		PZR spray valve	3.7	1
012 Reactor Protection	02	01										125V dc system; RPS channels, components, and interconnections	3.4; 3.3	2
013 Engineered Safety Features Actuation								01				LOCA	4.6	1
022 Containment Cooling				04								Cooling of control rod drive motors	2.8	1
025 Ice Condenser												N0 Ice Condenser at FCS		0
026 Containment Spray				07								Adequate level in containment sump for suction (interlock)	3.8	1
039 Main and Reheat Steam							06					Main steam pressure	3	1
059 Main Feedwater									02			Programmed levels of the S/G	2.9	1
061 Auxiliary/Emergency Feedwater			01									RCS	4.4	1
062 AC Electrical Distribution								16				Degraded system voltages	2.5	1
063 DC Electrical Distribution								01	01			Grounds; Meters, annunciators, dials, recorders, and indicating lights	2.5; 2.7	2
064 Emergency Diesel Generator			02									ESFAS controlled or actuated systems	4.2	1
073 Process Radiation Monitoring							01					Radiation levels	3.2	1
076 Service Water	16	01										ESF; Service water	3.6; 2.7	2
078 Instrument Air										01		Pressure gauges	3.1	1
103 Containment				04								Personnel access hatch and emergency access hatch	2.5	1
K/A Category Totals:	3	2	2	3	2	1	2	4	2	3	4	Group Point Total:		28

ES-401	PWR Examination Outline - Rev 2											Form ES-401-2		
Plant Systems - Tier 2/Group 2 (RO)														
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					9 7							Relationship of T-ave. to T-ref	3.3	1
002 Reactor Coolant														0
011 Pressurizer Level Control											04. 06	Knowledge of EOP mitigation strategies.	3.7	1
014 Rod Position Indication				0 3								Rod bottom lights	3.2	1
015 Nuclear Instrumentation														0
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 2									Containment entry	2.9	1
033 Spent Fuel Pool Cooling	0 2											RHRS	2.5	1
034 Fuel Handling Equipment														0
035 Steam Generator														0
041 Steam Dump/Turbine Bypass Control						0 3						Controller and positioners, including ICS, S/G, CRDS	2.7	1
045 Main Turbine Generator														0
055 Condenser Air Removal			0 1									Main condenser	2.5	1
056 Condensate								0 4				Loss of condensate pumps	2.6	1
068 Liquid Radwaste														0
071 Waste Gas Disposal				0 1								Pressure capability of the waste gas decay tank	2.6	1
072 Area Radiation Monitoring														0
075 Circulating Water														0
079 Station Air														0
086 Fire Protection				0 3								Detection and location of fires	3.1	1
K/A Category Totals:	1	0	2	3	1	1	0	1	0	0	1	Group Point Total:		10

ES-401		PWR Examination Outline - Rev 2						Form ES-401-2	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (SRO)									
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000007 Reactor Trip / 1									1
CE/E02 Reactor Trip Recovery / 1						02. 25	Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.	4.2	
000008 Pressurizer Vapor Space Accident / 3									0
000009 Small Break LOCA / 3									0
000011 Large Break LOCA / 3					1 4		Actions to be taken if limits for PTS are violated	4	1
000015 RCP Malfunctions / 4									1
000017 RCP Malfunctions (Loss of RC Flow) / 4					0 1		Cause of RCP failure	3.5	
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
000038 Steam Gen. Tube Rupture / 3									0
000040 Steam Line Rupture / 4									0
CE/E05 Excessive Steam Demand / 4									
000054 Loss of Main Feedwater / 4					0 8		Steam flow-feed trend recorder	3.3	1
CE/E06 Loss of Feedwater / 4									
000055 Station Blackout / 6									0
000056 Loss of Off-site Power / 6									0
000057 Loss of Vital AC Inst. Bus / 6									0
000058 Loss of DC Power / 6									0
000062 Loss of Nuclear Svc Water / 4									0
000065 Loss of Instrument Air / 8						04. 06	Knowledge of EOP mitigation strategies.	4.7	1
000077 Generator Voltage and Electric Grid Disturbances / 6					0 2		Voltage outside the generator capability curve	3.6	1
K/A Category Totals:	0	0	0	0	4	2	Group Point Total:		6

ES-401	PWR Examination Outline - Rev 2											Form ES-401-2		
Plant Systems - Tier 2/Group 1 (SRO)														
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														0
004 Chemical and Volume Control								0 6				Inadvertent boration/dilution	4.3	1
005 Residual Heat Removal														0
006 Emergency Core Cooling								0 1				High bearing temperature	3.1	1
007 Pressurizer Relief/Quench Tank														0
008 Component Cooling Water														0
010 Pressurizer Pressure Control														0
012 Reactor Protection														0
013 Engineered Safety Features Actuation														0
022 Containment Cooling														0
025 Ice Condenser														0
026 Containment Spray											04. 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.	4.6	1
039 Main and Reheat Steam														0
059 Main Feedwater								1 2				Failure of feedwater regulating valves	3.4	1
061 Auxiliary/Emergency Feedwater														0
062 AC Electrical Distribution														0
063 DC Electrical Distribution														0
064 Emergency Diesel Generator														0
073 Process Radiation Monitoring														0
076 Service Water								0 1				Loss of SWS	3.7	1
078 Instrument Air														0
103 Containment														0
K/A Category Totals:	0	0	0	0	0	0	0	4	0	0	0	1	Group Point Total:	5

ES-401	PWR Examination Outline - Rev 2										Form ES-401-2				
Plant Systems - Tier 2/Group 2 (SRO)															
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												02.42	Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	4.6	1
002 Reactor Coolant															0
011 Pressurizer Level Control															0
014 Rod Position Indication															0
015 Nuclear Instrumentation															0
016 Non-nuclear Instrumentation															0
017 In-core Temperature Monitor															0
027 Containment Iodine Removal															0
028 Hydrogen Recombiner and Purge Control												01.25	Ability to interpret reference materials, such as graphs, curves, tables, etc.	4.2	1
029 Containment Purge															0
033 Spent Fuel Pool Cooling															0
034 Fuel Handling Equipment															0
035 Steam Generator															0
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	1				Loss of intake structure	3.2	1
079 Station Air															0
086 Fire Protection															0
K/A Category Totals:	0	0	0	0	0	0	0	0	1	0	0	2	Group Point Total:		3

Facility Name: Fort Calhoun Date of Exam:3/30/2009						
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1. 21	Ability to verify the controlled procedure copy.	3.5	1		
	2.1. 42	Knowledge of new and spent fuel movement procedures.	2.5	1		
	2.1. 34	Knowledge of primary and secondary plant chemistry limits.			3.5	1
	2.1. 40	Knowledge of refueling administrative requirements.			3.9	1
	2.1.					
	2.1.					
	Subtotal				2	
2. Equipment Control	2.2. 12	Knowledge of surveillance procedures.	3.7	1		
	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		
	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	1		
	2.2. 37	Ability to determine operability and/or availability of safety related equipment.			4.6	1
	2.2.					
	2.2.					
	Subtotal				3	
3. Radiation Control	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-	3.2	1		
	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		
	2.3. 11	Ability to control radiation releases.	3.8	1		
	2.3. 15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.			3.1	1
	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			3.8	1
	2.3.					
	Subtotal				3	
4. Emergency Procedures / Plan	2.4. 03	Ability to identify post-accident instrumentation.	3.7	1		
	2.4. 02	Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.	4.5	1		
	2.4. 16	Knowledge of EOP implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures,			4.4	1
	2.4. 18	Knowledge of the specific bases for EOPs.			4	1
	2.4.					
	2.4.					
Subtotal				2		2
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
1/1	000025 K2.08	Low Importance - No Plant Specific Priority
1/1	000025 K2.12	Low Importance - No Plant Specific Priority
1/1	000025 K2.04	Low Importance - No Plant Specific Priority
1/1	000025 K2.11	Low Importance - No Plant Specific Priority
1/1	000025 K2.06	Low Importance - No Plant Specific Priority
1/1	000015 02.38	No related license conditions
1/1	000065 K2.02	Low Importance - No Plant Specific Priority
1/1	000065 K2.01	Low Importance - No Plant Specific Priority
1/1	000065 K2.05	Low Importance - No Plant Specific Priority
1/1	000065 K2.04	Low Importance - No Plant Specific Priority
1/1	000065 K2.03	Low Importance - No Plant Specific Priority
1/1	000065 K1.01	Low Importance - No Plant Specific Priority
1/1	000058 K2.01	Low Importance - No Plant Specific Priority
1/1	000058 K2.02	Low Importance - No Plant Specific Priority
1/2	000059 K1.05	ROs do not calculate offsite doses at FCS
1/2	000076 K2.03	Low Importance - No Plant Specific Priority
1/2	000032 K1.01	Generic Fundamentals Topic
1/2	000060 K1.03	Low Importance - No Plant Specific Priority
2/1	006000 K5.11	Generic Fundamentals Topic
2/1	006000 K5.12	Low Importance - No Plant Specific Priority
2/1	008000 02.39	No "less than 1 hr" Tech Specs associated with CCW
2/1	059000 K2.02	Low Importance - No Plant Specific Priority
2/1	059000 K2.01	Low Importance - No Plant Specific Priority
2/1	059000 A3.05	Low Importance - No Plant Specific Priority
2/1	059000 A3.07	ICS is a B&W system N/A to FCS
2/1	026000 K6.05	Low Importance - No Plant Specific Priority

Tier / Group	Randomly Selected K/A	Reason for Rejection
2/1	026000 K6.03	Low Importance - No Plant Specific Priority
2/1	026000 K6.02	Low Importance - No Plant Specific Priority
2/1	026000 K6.01	Low Importance - No Plant Specific Priority
2/1	026000 K6.04	Low Importance - No Plant Specific Priority
2/1	026000 K5.02	Low Importance - No Plant Specific Priority
2/1	026000 K5.04	Low Importance - No Plant Specific Priority
2/1	026000 K5.03	Low Importance - No Plant Specific Priority
2/1	026000 K5.01	Low Importance - No Plant Specific Priority
2/1	005000 K6.09	Low Importance - No Plant Specific Priority
2/1	005000 K6.02	Low Importance - No Plant Specific Priority
2/1	005000 K6.05	Low Importance - No Plant Specific Priority
2/1	005000 K6.06	Low Importance - No Plant Specific Priority
2/1	005000 K6.10	Low Importance - No Plant Specific Priority
2/1	005000 K6.08	Low Importance - No Plant Specific Priority
2/1	022000 K4.01	No plant specific penetration cooling system at FCS
2/1	022000 K4.02	No fan speed or flowpath change with pressure at FCS
2/1	063000 A2.02	Low Importance - No Plant Specific Priority
2/1	007000 K5.06	Low Importance - No Plant Specific Priority
2/1	007000 K5.03	Low Importance - No Plant Specific Priority
2/1	007000 K5.05	Low Importance - No Plant Specific Priority
2/1	007000 K5.01	Low Importance - No Plant Specific Priority
2/1	007000 K5.04	Low Importance - No Plant Specific Priority
2/2	055000 K3.04	Low Importance - No Plant Specific Priority
2/2	055000 K3.03	Low Importance - No Plant Specific Priority
2/2	041000 K6.04	Low Importance - No Plant Specific Priority
2/2	041000 K6.05	Low Importance - No Plant Specific Priority

Tier / Group	Randomly Selected K/A	Reason for Rejection
2/2	041000 K6.06	Low Importance - No Plant Specific Priority
2/2	041000 K6.01	Low Importance - No Plant Specific Priority
2/2	041000 K6.02	Low Importance - No Plant Specific Priority
2/2	033000 K1.01	Low Importance - No Plant Specific Priority
2/2	033000 K1.07	Low Importance - No Plant Specific Priority
2/2	033000 K1.03	Low Importance - No Plant Specific Priority
2/2	068000 A1.01	Low Importance - No Plant Specific Priority
2/2	068000 A1.02	Low Importance - No Plant Specific Priority
2/2	068000 K3.02	Low Importance - No Plant Specific Priority
2/2	068000 K3.01	Low Importance - No Plant Specific Priority
2/2	068000 K6.04	Low Importance - No Plant Specific Priority
2/2	068000 K6.08	Low Importance - No Plant Specific Priority
2/2	068000 K6.07	Low Importance - No Plant Specific Priority
2/2	068000 K6.06	Low Importance - No Plant Specific Priority
2/2	068000 K6.03	Low Importance - No Plant Specific Priority
2/2	068000 K6.11	Low Importance - No Plant Specific Priority
2/2	068000 K6.02	Low Importance - No Plant Specific Priority
2/2	068000 K6.06	Low Importance - No Plant Specific Priority
2/2	068000 K6.01	Low Importance - No Plant Specific Priority
2/2	079000 A3.01	Low Importance - No Plant Specific Priority
2/2	079000 A3.03	Low Importance - No Plant Specific Priority
2/2	079000 A3.02	Low Importance - No Plant Specific Priority
2/2	079000 K4.02	Low Importance - No Plant Specific Priority
2/2	079000 K6.04	Low Importance - No Plant Specific Priority
2/2	079000 K6.02	Low Importance - No Plant Specific Priority
2/2	079000 K6.05	Low Importance - No Plant Specific Priority

Tier / Group	Randomly Selected K/A	Reason for Rejection
2/2	079000 K6.07	Low Importance - No Plant Specific Priority
2/2	079000 K6.04	Low Importance - No Plant Specific Priority
2/2	079000 K6.01	Low Importance - No Plant Specific Priority
2/2	079000 K6.06	Low Importance - No Plant Specific Priority
2/2	079000 K6.03	Low Importance - No Plant Specific Priority
2/2	079000 K5.01	Low Importance - No Plant Specific Priority
2/2	079000 K5.02	Low Importance - No Plant Specific Priority
2/2	056000 A2.09	Low Importance - No Plant Specific Priority
2/2	056000 A2.03	Low Importance - No Plant Specific Priority
1/1	00062 AA2.06	No procedure or reference to support question
1/2	000076 AK2.01	Radiation Monitors not used to detect high RCS activity
1/2	000076 AK2.06	Low Importance - No Plant Specific Priority
1/2	000076 AK2.05	Low Importance - No Plant Specific Priority
1/2	000076 AK2.04	Low Importance - No Plant Specific Priority
1/2	000076 AK2.02	Low Importance - No Plant Specific Priority
2/1	026000 K4.05	No procedure or reference to support question
2/2	079000 A4.01	Not a Fort Calhoun Design Feature
2/2	079000 all remaining	Low Importance - No Plant Specific Priority
1/2	000032 AK3.01	Overlap with SRO question
2/1	073000 K4.01	Overlap with Audit Exam
2/1	073000 K4.02	Not a Fort Calhoun Design Feature
2/2	068000 K6.10	Overlap with Audit Exam
2/2	086000 K1.02	Overlap with SRO question

Facility: <u>Fort Calhoun</u>		Date of Examination: <u>3/30/09</u>
Examination Level: RO		Revision Number: 3
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
<u>A-1</u> Conduct of Operations	M, R	Calculate Shutdown Margin with inoperable CEAs KA 2.1.37 (RO Imp 4.3)
<u>A-2</u> Conduct of Operations	N, R	Determine Pressurizer Level During Cooldown KA 2.1.25 (RO Imp 3.9)
<u>A-3</u> Equipment Control	N, R	Determine Equipment Lost by Tagout of an MCC KA 2.2.41 (RO Imp 3.5)
<u>A-4</u> Radiation Control	D	RCA Entry and Exit with PCM Alarms KA 2.3.13 (RO Imp 3.4)
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)		

Facility: <u>Fort Calhoun</u>		Date of Examination: <u>3/30/09</u>
Examination Level: SRO		Revision Number: 3
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
<u>A-5</u> Conduct of Operations	M, R	Review Shutdown Margin Calculation with inoperable CEAs KA 2.1.37 (SRO Imp 4.6)
<u>A-6</u> Conduct of Operations	M, R	Determine Shift Staffing KA 2.1.5 (SRO Imp 3.9)
<u>A-7</u> Equipment Control	D, R	Determine RW System Operability KA 2.2.37 (SRO Imp 4.6)
<u>A-8</u> Radiation Control	D, R	Authorize Release of Monitor Tank WD-22B KA 2.3.6 (SRO Imp 3.6)
<u>A-9</u> Emergency Procedures/Plan	M, R	Emergency Classification and PARs KA's 2.4.41 (SRO Imp 4.6) and 2.4.44 (SRO Imp 4.4)
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		
* Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1 ; randomly selected)		

Facility: <u>Fort Calhoun</u>		Date of Examination: <u>3/30/09</u>
Exam Level: RO		Revision Number.: 3
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. 001000 A4.03 / Control Element Assembly Movement Test	S, N, A	1
S-2. 004000 A4.08 / Establish Charging Flow via HPSI Header	S, N	2
S-3 006000 A1.11 / Simultaneous Hot and Cold Leg Injection	S,A, M, EN, L	3
S-4. 003000 A4.06 / Start a Reactor Coolant Pump	S, A, L,M	4P
S-5 061000 A2.04 / Initiate AFW to SGs	S, EN, A, N, L	4S
S-6 028000 A1.01 / Operate the Containment Hydrogen Analyzer	S, D	5
S-7 062000 A4.01 / Transfer 4160 V buses from 345 KV to 161 KV	S, D	6
S-8. 012000 A4.02 / RPS Power Adjustment	S, N	7
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
P-1 022000 A2.05 / Provide Raw Water Backup Cooling to Containment Coolers	E,R,M	5
P-2 000055 EA1.07 / Energize 480 V buses from 13.8 KV	E, N	6
P-3 086000 A2.04 / Local Emergency Manual Start of Diesel Fire Pump	E,A,D	8
<p>@ 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>		
* 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		

Facility: <u>Fort Calhoun</u>		Date of Examination: <u>3/30/09</u>
Exam Level: ISRO		Revision Number.: 3
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. 001000 A4.03 / Control Element Assembly Movement Test	S, N, A	1
S-2. 004000 A4.08 / Establish Charging Flow via HPSI Header	S, N	2
S-3 006000 A1.11 / Simultaneous Hot and Cold Leg Injection	S,A, M, EN, L	3
S-4. 003000 A4.06 / Start a Reactor Coolant Pump	S, A, L,M	4P
S-5 061000 A2.04 / Initiate AFW to SGs	S, EN, A, N, L	4S
S-7 062000 A4.01 / Transfer 4160 V buses from 345 KV to 161 KV	S, D	6
S-8. 012000 A4.02 / RPS Power Adjustment	S, N	7
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
P-1 022000 A2.05 / Provide Raw Water Backup Cooling to Containment Coolers	E,R,M	5
P-2 000055 EA1.07 / Energize 480 V buses from 13.8 KV	E, N	6
P-3 086000 A2.04 / Local Emergency Manual Start of Diesel Fire Pump	E,A,D	8
<p>@ 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>		
* 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		

Facility: <u>Fort Calhoun</u>		Date of Examination: <u>3/30/09</u>
Exam Level: USRO		Revision Number.: 3
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-3 006000 A1.11 / Simultaneous Hot and Cold Leg Injection	S,A, M, EN, L	3
S-5 061000 A2.04 / Initiate AFW to SGs	S, EN, A, N, L	4S
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
P-1 022000 A2.05 / Provide Raw Water Backup Cooling to Containment Coolers	E,R,M	5
P-2 000055 EA1.07 / Energize 480 V buses from 13.8 KV	E, N	6
P-3 086000 A2.04 / Local Emergency Manual Start of Diesel Fire Pump	E,A,D	8
<p>@ 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>		
* Type Codes	Criteria for RO / SRO-I / SRO-U	
(A)lternate path	4-6 / 4-6 / 2-3	
(C)ontrol room	≤ 9 / ≤ 8 / ≤ 4	
(D)irect from bank	≥ 1 / ≥ 1 / ≥ 1	
(E)mergency or abnormal in-plant	- / - / ≥1 (control room system)	
(EN)gineered safety feature	≥ 1 / ≥ 1 / ≥ 1	
(L)ow-Power / Shutdown	≥ 2 / ≥ 2 / ≥ 1	
(N)ew or (M)odified from bank including 1(A)	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)	
(P)revious 2 exams	≥ 1 / ≥ 1 / ≥ 1	
(R)CA		
(S)imulator		

Facility: Fort Calhoun		Scenario No: 2009-2		Revision: 3	
Examiners: _____ _____			Operators: _____ _____		
Initial Conditions: 100% Power DG-1 Out of Service replacing contactors for 2CR relays.					
Turnover: Rotate Condenser Evacuation Pumps, then rotate Containment Cooling Units.					
Event No.	Malf No.	Event Type*	Event Description		
1 (2 min)		N-BOPO	Rotate Condenser Evacuation Pumps per OI-CE-1, Attachment 3.		
2 (10 min)		N-ATCO	Rotate Containment Cooling Units In accordance with OI-VA-1.		
3 LE CUE		C-ATCO C-BOPO	Dropped CEA - Tech Spec Entry.		
4		R-ATCO N-BOPO	AOP-05 shutdown to 70% Power.		
5 LE CUE		I-ATCO	Controlling Pressurizer Pressure Transmitter, PT-103Y, Fails High.		
6 LE CUE		C-BOPO	Loss of 161 KV - Tech Spec Entry.		
7 LE CUE		C-ATCO	Another Dropped CEA - Manual Reactor Trip Required.		
8		M-ALL	Circulating Water Pump, CW-1C, Breaker fails to open preventing DG from loading onto bus 1A4 - Station Blackout.		
* (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)	1
7.	Critical tasks (2–3)	2

Facility: Fort Calhoun		Scenario No: 2009-4		Revision: 5	
Examiners: _____ _____			Operators: _____ _____		
Initial Conditions: 50% Power, Diesel Driven AFW Pump, FW-54, Out of Service, Main Feed Pumps, FW-4A and FW-4C, Out of Service.					
Turnover: Maintain 50% operation. Rotate CCW Pumps.					
Event No.	Malf No.	Event Type*	Event Description		
1 (2 min)		N-ATCO	Rotate CCW Pumps.		
2 LE CUE		C-BOPO	Isolated Phase Bus Duct Cooling Fan Motor Trips.		
3 LE CUE		I-ATCO TS-CRS	Pressurizer Pressure Safety Channel fails Low - Tech Spec Entry.		
4 LE CUE		I-BOPO	Steam header pressure transmitter, PT-910 Fails High.		
5 LE CUE		C - ATCO TS-CRS	10-15 gpm leak to containment - Tech Spec Entry.		
6 LE CUE		C - ATCO	Feedwater Pump Trips, Reactor Trip.		
7		C-BOPO	Blowdown fails to isolate automatically.		
8 LE CUE		M - ALL	Pipe from EFWST to FW-6 and FW-10 breaks. Total Loss of Feedwater.		
* (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)	2
4.	Major transients (1–2)	1
5.	EOPs entered/requiring substantive actions (1–2)	1
6.	EOP contingencies requiring substantive actions (0–2)	1
7.	Critical tasks (2–3)	2 or 3

Facility: Fort Calhoun	Scenario No: 2009-1 (SPARE)	Revision: 3	
Examiners: _____ _____	Operators: _____ _____		
Initial Conditions: 100% Power. Diesel Driven AFW Pump, FW-54, is out of service. Air Compressor, CA-1A, is out of service.			
Turnover: Transfer Letdown Control Valves from LCV-101-1 to LCV-101-2. After that rotate running EHC Pumps.			
Event No.	Malf No.	Event Type*	Event Description
1 (2 min)		N-ATCO	Transfer Letdown Flow Control Valves.
2 (14 min)		N-BOPO	Rotate EHC Pumps.
3 LE CUE		I-ATCO	Power Range NI Channel B fails - Tech Spec Entry.
4 LE CUE		C-BOPO	Running Bearing Cooling Water Pump, AC-9A, trips.
5 LE CUE		I-ATCO	Loop Two Hot Leg RTD, TT-122H, Fails High - Tech Spec Entry
6 LE CUE		C-All	Loss of Instrument Air.
7		C-ATCO	Manual Reactor Trip Required.
8 LE CUE		M-All	Steam Generator Safety Valve Fails Open.
* (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)	2
4.	Major transients (1–2)	1
5.	EOPs entered/requiring substantive actions (1–2)	1
6.	EOP contingencies requiring substantive actions (0–2)	1
7.	Critical tasks (2–3)	3