

Facility: <u>Arkansas Nuclear One Unit 2</u>		Date of Examination: <u>08/27/2012</u>
Examination Level: RO <input checked="" type="checkbox"/> SRO <input type="checkbox"/>		Operating Test Number: <u>2012-1</u>
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
A1. Conduct of Operations 2.1.25 RO (3.9)	D/P/R	Determine any limits for CEA positions using the COLR PDIL ANO-2-JPM-NRC-ADMIN-PDIL
A2. Conduct of Operations 2.1.23 RO (4.3)	D/R	Calculate Time to Boil using computer program ANO-2-JPM-NRC-ADMIN-TTBCRO
A3. Equipment Control 2.2.42 RO (3.9)	D/R	Review 2P-89B surveillance to determine operability ANO-2-JPM-NRC-ADMIN-2P89BSURV
A4. Radiation Control 2.3.4 RO (3.2)	N/R	Calculate expected dose for Re-entry during emergency and if applicable limits will be exceeded ANO-2-JPM-NRC-ADMIN-EMGRES P
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 ( $\leq 3$ 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)		

Facility Name:ANO Unit 2		Date of Exam:6/24/2012																					
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	3	3	6						
	2	1	1	2	N/A			2	2	N/A			1	9	2	2	4						
	Tier Totals	4	4	5	N/A			5	5	N/A			4	27	5	5	10						
2. Plant Systems	1	2	3	2	3	3	3	3	2	3	1	3	28	2	3	5							
	2	1	1	1	1	1	1	1	1	0	1	1	10	0	1	2	3						
	Tier Totals	3	4	3	4	4	4	4	3	3	2	4	38	3	5	8							
3. Generic Knowledge and Categories	Abilities	1				2				3				4				10	1	2	3	4	7
		2				2				3				3					2	2	1	2	

- Note: 1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).
2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.
3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.
4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.
5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
- 7.\* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.
8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G\* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.
9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

ES-401		PWR Examination Outline						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	0 3						Reasons for closing the main turbine governor valve and the main turbine stop valve after a reactor trip	3.7	1
CE/E02 Reactor Trip Recovery / 1									
000008 Pressurizer Vapor Space Accident / 3				0 6			Control of PZR level	3.6	1
000009 Small Break LOCA / 3					3 3		RCS water inventory balance and Tech-Spec limits	3.3	1
000011 Large Break LOCA / 3			0 8				Flowpath for sump recirculation	3.9	1
000015 RCP Malfunctions / 4	0 1						Natural circulation in a nuclear reactor power plant	4.4	1
000017 RCP Malfunctions (Loss of RC Flow) / 4									
000022 Loss of Rx Coolant Makeup / 2				0 6			CVCS charging pump ammeters and running indicators	2.9	1
000025 Loss of RHR System / 4									0
000026 Loss of Component Cooling Water / 8						02. 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
000027 Pressurizer Pressure Control System Malfunction / 3									0
000029 ATWS / 1	0 5						definition of negative temperature coefficient as applied to large PWR coolant systems	2.8	1
000038 Steam Gen. Tube Rupture / 3			0 8				Criteria for securing RCP	4.1	1
000040 Steam Line Rupture / 4		0 2					Sensors and detectors	2.6	1
CE/E05 Excessive Steam Demand / 4									
000054 Loss of Main Feedwater / 4									1
CE/E06 Loss of Feedwater / 4		0 2					Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the	3.5	
000055 Station Blackout / 6					0 1		Existing valve positioning on a loss of instrument air system	3.4	1
000056 Loss of Off-site Power / 6						04. 03	Ability to identify post-accident instrumentation.	3.7	1
000057 Loss of Vital AC Inst. Bus / 6					2 0		Interlocks in effect on loss of ac vital electrical instrument bus that must be bypassed to restore normal equipment operation	3.6	1
000058 Loss of DC Power / 6						04. 02	Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.	4.5	1
000062 Loss of Nuclear Svc Water / 4			0 4				Effect on the nuclear service water discharge flow header of a loss of CCW	3.5	1
000065 Loss of Instrument Air / 8				0 3			Restoration of systems served by instrument air when pressure is regained	2.9	1
000077 Generator Voltage and Electric Grid Disturbances / 6		0 2					Breakers, relays	3.1	1
K/A Category Totals:	3	3	3	3	3	3	Group Point Total:		18



ES-401	PWR Examination Outline											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			0 2									S/G	3.5	1
004 Chemical and Volume Control											01. 27	Knowledge of system purpose and/or function.	3.9	1
005 Residual Heat Removal		0 1		0 7								RHR pumps; System protection logics, including high-pressure interlock, reset controls, and valve interlocks	3; 3.2	2
006 Emergency Core Cooling		0 4										ESFAS-operated valves	3.6	1
007 Pressurizer Relief/Quench Tank					0 2							Method of forming a steam bubble in the PZR	3.1	1
008 Component Cooling Water							0 2				01. 28	CCW temperature; Knowledge of the purpose and function of major system components and controls.	2.9; 4.1	2
010 Pressurizer Pressure Control					0 2	0 1						Constant enthalpy expansion through a valve; Pressure detection systems	2.6; 2.7	2
012 Reactor Protection		0 1										RPS channels, components, and interconnections	3.3	1
013 Engineered Safety Features Actuation						0 1						Sensors and detectors	2.7	1
022 Containment Cooling									0 1			Initiation of safeguards mode of operation	4.1	1
025 Ice Condenser														0
026 Containment Spray											02. 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	4.2	1
039 Main and Reheat Steam				0 4								Utilization of steam pressure program control when steam dumping through atmospheric relief/dump valves, including T-ave. limits	2.9	1
059 Main Feedwater								1 1				Failure of feedwater control system	3.0	1
061 Auxiliary/Emergency Feedwater						0 2						Pumps	2.6	1
062 AC Electrical Distribution										0 7		Synchronizing and paralleling of different ac supplies	3.1	1
063 DC Electrical Distribution							0 1		0 1			Battery capacity as it is affected by discharge rate; Meters, annunciators, dials, recorders, and indicating lights	2.5; 2.7	2
064 Emergency Diesel Generator							0 1					ED/G lube oil temperature and pressure	3.0	1
073 Process Radiation Monitoring					0 1			0 1				Radiation theory, including sources, types, units, and effects; Erratic or failed power supply	2.5; 2.5	2
076 Service Water			0 5	0 2								RHR components, controls, sensors, indicators, and alarms, including rad monitors; Automatic start features associated with SWS pump controls	3; 2.9	2
078 Instrument Air	0 5								0 1			MSIV air; Air pressure	3.4; 3.1	2
103 Containment	0 1											CCS	3.6	1
K/A Category Totals:	2	3	2	3	3	3	3	2	3	1	3	Group Point Total:		28

ES-401	PWR Examination Outline											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														0
002 Reactor Coolant					1 1							Relationship between effects of the primary coolant system and the secondary coolant system	4.0	1
011 Pressurizer Level Control														0
014 Rod Position Indication														0
015 Nuclear Instrumentation		0 1										NIS channels, components, and interconnections	3.3	1
016 Non-nuclear Instrumentation														0
017 In-core Temperature Monitor						0 1						Sensors and detectors	2.7	1
027 Containment Iodine Removal														0
028 Hydrogen Recombiner and Purge Control														0
029 Containment Purge														0
033 Spent Fuel Pool Cooling			0 3									Spent fuel temperature	3.0	1
034 Fuel Handling Equipment														0
035 Steam Generator										0 8		Recognition that increasing radiation levels in secondary systems may mean leaking and possibly ruptured S/G tubes	4.1	1
041 Steam Dump/Turbine Bypass Control							0 2					Steam pressure	3.1	1
045 Main Turbine Generator														0
055 Condenser Air Removal	0 6											PRM system	2.6	1
056 Condensate														0
068 Liquid Radwaste														0
071 Waste Gas Disposal											01. 28	Knowledge of the purpose and function of major system components and controls.	4.1	1
072 Area Radiation Monitoring								0 2				Detector failure	2.8	1
075 Circulating Water				0 1								Heat sink	2.5	1
079 Station Air														0
086 Fire Protection														0
K/A Category Totals:	1	1	1	1	1	1	1	1	0	1	1	Group Point Total:		10

ES-401	PWR Examination Outline							Form ES-401-2	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (SRO)									
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					0 2		Proper actions to be taken if the automatic safety functions have not taken place	4.6	1
CE/E02 Reactor Trip Recovery / 1									
000008 Pressurizer Vapor Space Accident / 3									0
000009 Small Break LOCA / 3									0
000011 Large Break LOCA / 3									0
000015 RCP Malfunctions / 4 000017 RCP Malfunctions (Loss of RC Flow) / 4									0
000022 Loss of Rx Coolant Makeup / 2						02. 36	Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.	4.2	1
000025 Loss of RHR System / 4									0
000026 Loss of Component Cooling Water / 8									0
000027 Pressurizer Pressure Control System Malfunction / 3					0 4		Tech-Spec limits for RCS pressure	4.3	1
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
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						04. 47	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	4.2	1
000062 Loss of Nuclear Svc Water / 4					0 5		The normal values for SWS-header flow rate and the flow rates to the components cooled by the SWS	2.5	1
000065 Loss of Instrument Air / 8						02. 42	Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	4.6	1
000077 Generator Voltage and Electric Grid Disturbances / 6									0
K/A Category Totals:	0	0	0	0	3	3	Group Point Total:		6





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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
005 Residual Heat Removal														0
006 Emergency Core Cooling														0
007 Pressurizer Relief/Quench Tank								0 2				Abnormal pressure in the PRT	3.2	1
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											02. 12	Knowledge of surveillance procedures.	4.1	1
039 Main and Reheat Steam														0
059 Main Feedwater											01. 30	Ability to locate and operate components, including local controls.	4.0	1
061 Auxiliary/Emergency Feedwater														0
062 AC Electrical Distribution														0
063 DC Electrical Distribution								0 2				Loss of ventilation during battery charging	3.1	1
064 Emergency Diesel Generator											04. 06	Knowledge of EOP mitigation strategies.	4.7	1
073 Process Radiation Monitoring														0
076 Service Water														0
078 Instrument Air														0
103 Containment														0
K/A Category Totals:	0	0	0	0	0	0	0	2	0	0	3	Group Point Total:		5

ES-401	PWR Examination Outline											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														0
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 2				Core damage	4.1	1
027 Containment Iodine Removal														0
028 Hydrogen Recombiner and Purge Control														0
029 Containment Purge														0
033 Spent Fuel Pool Cooling											02. 42	Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	4.6	1
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											01. 13	Knowledge of facility requirements for controlling vital/controlled access.	3.2	1
056 Condensate														0
068 Liquid Radwaste														0
071 Waste Gas Disposal														0
072 Area Radiation Monitoring														0
075 Circulating Water														0
079 Station Air														0
086 Fire Protection														0
K/A Category Totals:	0	0	0	0	0	0	0	1	0	0	2	Group Point Total:		3

Facility Name: ANO Unit 2      Date of Exam: 6/24/2012						
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1. 20	Ability to interpret and execute procedure steps.	4.6	1		
	2.1. 03	Knowledge of shift or short-term relief turnover practices.	3.7	1		
	2.1. 03	Knowledge of shift or short-term relief turnover practices.			3.9	1
	2.1. 13	Knowledge of facility requirements for controlling vital/controlled access.			3.2	1
	2.1.					
	2.1.					
	Subtotal				2	
2. Equipment Control	2.2. 15	Ability to determine the expected plant configuration using design and configuration control documentation, such as drawings, line-ups, tag-outs, etc.	3.9	1		
	2.2. 40	Ability to apply Technical Specifications for a system.	3.4	1		
	2.2. 11	Knowledge of the process for controlling temporary design changes.			3.3	1
	2.2. 18	Knowledge of the process for managing maintenance activities during shutdown operations, such as risk assessments, work prioritization, etc.			3.9	1
	2.2.					
	2.2.					
	Subtotal				2	
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-radiation areas, aligning filters, etc.	3.2	1		
	2.3. 15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	2.9	1		
	2.3. 07	Ability to comply with radiation work permit requirements during normal or abnormal conditions.	3.5	1		
	2.3. 06	Ability to approve release permits.			3.8	1
	2.3.					
	2.3.					
	Subtotal				3	
4. Emergency Procedures / Plan	2.4. 01	Knowledge of EOP entry conditions and immediate action steps.	4.6	1		
	2.4. 42	Knowledge of emergency response facilities.	2.6	1		
	2.4. 47	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	4.2	1		
	2.4. 14	Knowledge of general guidelines for EOP usage.			4.5	1
	2.4. 08	Knowledge of how abnormal operating procedures are used in conjunction with EOPs.			4.5	1
	2.4.					
	Subtotal				3	
Tier 3 Point Total				10		7



Facility: <u>Arkansas Nuclear One Unit 2</u>		Date of Examination: <u>08/27/2012</u>
Exam Level: RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>		Operating Test No.: <u>2012-1</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
S1. ANO-2-JPM-NRC-SIT09 006 A4.02 RO-4.0/SRO-3.8 Isolate SITs following SIAS with SIAS reset	A/D/EN/L/S	2 Inventory Control
S2. ANO-2-JPM-NRC-ELEC05 062 A4.01 RO3.3/SRO3.1 Transfer Auxiliaries from SU#2 to SU#3 for 2A-1	N/S	6 Electrical
S3. ANO-2-JPM-NRC-SDBC2 041 A4.05 RO-3.1/SRO-3.3 Manually Operate SDBCS valves	A/L/N/S	4 Heat Removal
S4. ANO-2-JPM-NRC-CCW01 008 A4.01 RO-3.3/SRO-3.1 Secure CCW system using EOP	D/L/S	8 Plant service systems
S5. ANO-2-JPM-NRC-CNMT2 103 A3.01 RO-3.9/SRO-4.2 Drain the containment sump	A/D/P/S	5 Containment Integrity
S6. ANO-2-JPM-NRC-CEA01 001 A4.03 RO-4.0/SRO-3.7 Perform a CEA exercise	D/P/S	1 Reactivity control
S7. ANO-2-JPM-NRC-CPC06 012 A4.02 RO-3.3/SRO-3.4 Place #1 CEAC to inop on "B" CPC	D/S	7 Instrumentation
S8. ANO-2-JPM-NRC-AOP3 010 A2.02 RO-3.9/SRO-3.9 Isolate failed PZR spray valve	A/D/P/S	3 Pressure Control
In-Plant Systems <sup>@</sup> (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
P1. ANO-2-JPM-NRC-EDDCB 064 A4.01 RO-4.0/SRO-4.3 Start EDG 2K-4B without DC	A/D/E/L	6 Electrical
P2. ANO-2-JPM-NRC-MGSU 001 A4.08 RO-3.7/SRO-3.4 Start the First MG set	D/L	1 Reactivity control
P3. ANO-2-JPM-NRC-FPEM1 033 A2.03 RO-3.1/SRO-3.5 Perform emergency SW make up to SFP	D/E/R	8 Plant service systems
<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		

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Administrative Topic (see Note)	Type Code*	Describe activity to be performed
A5. Conduct of Operations 2.1.32 SRO (4.0)	D/R	Review performing transferring Unit Auxiliary Calculation and determine if it they can be transferred. ANO-2-JPM-NRC-ADMIN-SU2LOADSRO
A6. Conduct of Operations 2.1.23 SRO (4.4)	D/R	Review Time to Boil Calculation. ANO-2-JPM-NRC-AMDIN-TTBCSRO
A7. Equipment Control 2.2.14 SRO (4.3)	D/R	Supervisory review of maintenance activities for configuration control ANO-2-JPM-NRC-ADMIN-MAINT
A8. Radiation Control 2.3.4 SRO (3.7)	N/R	Calculate expected dose for Re-entry during an emergency and determine if entry is allowed. ANO-2-JPM-NRC-ADMIN-EMGRESPSRO
A9. Emergency Procedures/Plan 2.4.41 SRO (4.6)	D/P/R	Determine Emergency Action Level for given conditions. ANO-2-JPM-NRC-ADMIN-EAL11
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 ( $\leq 3$ 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)		

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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
S1. ANO-2-JPM-NRC-SIT09 006 A4.02 RO-4.0/SRO-3.8 Isolate SITs following SIAS with SIAS reset	A/D/EN/L/S	2 Inventory Control
S2. ANO-2-JPM-NRC-ELEC05 062 A4.01 RO3.3/SRO3.1 Transfer Auxiliaries from SU#2 to SU#3 for 2A-1	N/S	6 Electrical
S3. ANO-2-JPM-NRC-SDBC2 041 A4.05 RO-3.1/SRO-3.3 Manually Operate SDBCS valves	A/L/N/S	4 Heat Removal
S4. ANO-2-JPM-NRC-CCW01 008 A4.01 RO-3.3/SRO-3.1 Secure CCW system using EOP	D/L/S	8 Plant service systems
S5. ANO-2-JPM-NRC-CNMT2 103 A3.01 RO-3.9/SRO-4.2 Drain the containment sump	A/D/P/S	5 Containment Integrity
S6. ANO-2-JPM-NRC-CEA01 001 A4.03 RO-4.0/SRO-3.7 Perform a CEA exercise	D/P/S	1 Reactivity control
S7. ANO-2-JPM-NRC-CPC06 012 A4.02 RO-3.3/SRO-3.4 Place #1 CEAC to inop on "B" CPC	D/S	7 Instrumentation
S8. ANO-2-JPM-NRC-AOP3 010 A2.02 RO-3.9/SRO-3.9 Isolate failed PZR spray valve	A/D/P/S	3 Pressure Control
In-Plant Systems <sup>@</sup> (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
P1. ANO-2-JPM-NRC-EDDCB 064 A4.01 RO-4.0/SRO-4.3 Start EDG 2K-4B without DC	A/D/E/L	6 Electrical
P2. ANO-2-JPM-NRC-MGSU 001 A4.08 RO-3.7/SRO-3.4 Start the First MG set	D/L	1 Reactivity control
P3. ANO-2-JPM-NRC-FPEM1 033 A2.03 RO-3.1/SRO-3.5 Perform emergency SW make up to SFP	D/E/R	8 Plant service systems
<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>		
* 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>Arkansas Nuclear One Unit 2</u>		Date of Examination: <u>08/27/2012</u>
Exam Level: RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/>		Operating Test No.: <u>2012-1</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
S1. ANO-2-JPM-NRC-SIT09 006 A4.02 RO-4.0/SRO-3.8 Isolate SITs following SIAS with SIAS reset	A/D/EN/L/S	2 Inventory Control
S2. ANO-2-JPM-NRC-ELEC05 062 A4.01 RO3.3/SRO3.1 Transfer Auxiliaries from SU#2 to SU#3 for 2A-1	N/S	6 Electrical
S3. ANO-2-JPM-NRC-SDBC2 041 A4.05 RO-3.1/SRO-3.3 Manually Operate SDBCS valves	A/L/N/S	4 Heat Removal
In-Plant Systems <sup>@</sup> (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
P2. ANO-2-JPM-NRC-MGSU 001 A4.08 RO-3.7/SRO-3.4 Start the First MG set	D/L	1 Reactivity control
P3. ANO-2-JPM-NRC-FPEM1 033 A2.03 RO-3.1/SRO-3.5 Perform emergency SW make up to SFP	D/E/R	8 Plant service systems
<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>		
* 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>Arkansas Nuclear One Unit 2</u>		Date of Examination: <u>08/27/2012</u>
Exam Level: RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>		Operating Test No.: <u>2012-1</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
S1. ANO-2-JPM-NRC-SIT09 006 A4.02 RO-4.0/SRO-3.8 Isolate SITs following SIAS with SIAS reset	A/D/EN/L/S	2 Inventory Control
S2. ANO-2-JPM-NRC-ELEC05 062 A4.01 RO3.3/SRO3.1 Transfer Auxiliaries from SU#2 to SU#3 for 2A-1	N/S	6 Electrical
S3. ANO-2-JPM-NRC-SDBC2 041 A4.05 RO-3.1/SRO-3.3 Manually Operate SDBCS valves	A/L/N/S	4 Heat Removal
S4. ANO-2-JPM-NRC-CCW01 008 A4.01 RO-3.3/SRO-3.1 Secure CCW system using EOP	D/L/S	8 Plant service systems
S5. ANO-2-JPM-NRC-CNMT2 103 A3.01 RO-3.9/SRO-4.2 Drain the containment sump	A/D/P/S	5 Containment Integrity
S6. ANO-2-JPM-NRC-CEA01 001 A4.03 RO-4.0/SRO-3.7 Perform a CEA exercise	D/P/S	1 Reactivity control
S7. ANO-2-JPM-NRC-CPC06 012 A4.02 RO-3.3/SRO-3.4 Place #1 CEAC to inop on "B" CPC	D/S	7 Instrumentation
In-Plant Systems® (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
P1. ANO-2-JPM-NRC-EDDCB 064 A4.01 RO-4.0/SRO-4.3 Start EDG 2K-4B without DC	A/D/E/L	6 Electrical
P2. ANO-2-JPM-NRC-MGSU 001 A4.08 RO-3.7/SRO-3.4 Start the First MG set	D/L	1 Reactivity control
P3. ANO-2-JPM-NRC-FPEM1 033 A2.03 RO-3.1/SRO-3.5 Perform emergency SW make up to SFP	D/E/R	8 Plant service systems
@ 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		

Facility: Arkansas Nuclear One			Date of Exam: 8-27-12			Operating Test No.: 2012-1											
A P P L I C A N T	E V E N T  T Y P E	Scenarios												T O T A L	M I N I M U M(*)		
		1			2			3 (currently selected as spare)			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
<input type="checkbox"/> RO <input checked="" type="checkbox"/> SRO-I <input checked="" type="checkbox"/> X <input type="checkbox"/> SRO-U	RX				3				1				1	1	1	0	
	NOR	1												1	1	1	1
	I/C	2,3,4,5,8			6,9			3,6					7	4	4	2	
	MAJ	6,7			5,7			5					4	2	2	1	
	TS	2,5											2	0	2	2	
<input type="checkbox"/> RO <input checked="" type="checkbox"/> SRO-I <input checked="" type="checkbox"/> X <input type="checkbox"/> SRO-U	RX		3										1	1	1	0	
	NOR			1				1					1	1	1	1	
	I/C		4,5	2,3,4,6,8,9				2,3,4,6,7					8	4	4	2	
	MAJ		6,7	5,7			5					4	2	2	1		
	TS			2,4			2,4					2	0	2	2		
<input type="checkbox"/> RO <input type="checkbox"/> SRO-I <input type="checkbox"/> X <input type="checkbox"/> SRO-U	RX												1	1	0		
	NOR												1	1	1		
	I/C												4	4	2		
	MAJ												2	2	1		
	TS												0	2	2		
<input type="checkbox"/> RO <input type="checkbox"/> SRO-I <input type="checkbox"/> X <input type="checkbox"/> SRO-U	RX												1	1	0		
	NOR												1	1	1		
	I/C												4	4	2		
	MAJ												2	2	1		
	TS												0	2	2		

Instructions:

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

Facility: Arkansas Nuclear One			Date of Exam: 8-27-12			Operating Test No.: 2012-1											
A P P L I C A N T	E V E N T  T Y P E	Scenarios												T O T A L	M I N I M U M(*)		
		1			2			3 (currently selected as spare)			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P		R	I	U
<input checked="" type="checkbox"/> RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U	RX	3											1	1	1	0	
	NOR					1			1				1	1	1	1	
	I/C	4,5				2,3,8			2,4,7				5	4	4	2	
	MAJ	6,7				5,7			5				4	2	2	1	
	TS												0	0	2	2	
<input checked="" type="checkbox"/> RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U	RX				4			1					1	1	1	0	
	NOR			1									1	1	1	1	
	I/C			2,3,8	6,9			3,6					5	4	4	2	
	MAJ			6,7	5,7			5					4	2	2	1	
	TS												0	0	2	2	
<input type="checkbox"/> RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/> X	RX												0	1	1	0	
	NOR	1											1	1	1	1	
	I/C	2,3,4,5,8											5	4	4	2	
	MAJ	6,7											2	2	2	1	
	TS	2,5											2	0	2	2	
<input type="checkbox"/> RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/> X	RX												0	1	1	0	
	NOR				1			1					1	1	1	1	
	I/C				2,3,4,6,8,9			2,3,4,6,7					6	4	4	2	
	MAJ				5,7			5					2	2	2	1	
	TS				2,4			2,4					2	0	2	2	
Instructions: 1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO <i>additionally</i> serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.  2. Reactivity manipulations may be conducted under normal or <i>controlled</i> abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.  3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.																	

Facility: ANO-2		Scenario No.: 1 (New)		Op-Test No.: 2012-1	
Examiners:			Operators:		
Initial Conditions: ~94% power due to Main Steam Line high vibs, MOL, All Engineered Safety Features systems are in standby. #3 and #4 MTG control valve steam lead valves failed closed. Voltage regulator auto tracking circuit is disabled. RED Train Maintenance Week.					
Turnover: ~94% power due to Main Steam Line high vibs, 260 EFPD. EOOS indicates 'Minimal Risk'. RED Train Maintenance Week. #3 and #4 MTG control valve steam lead valves failed closed. Voltage regulator auto tracking circuit is disabled. Scheduled Evolution: Swap running Electro Hydraulic (EH) pumps.					
Event No.	Malf. No.	Event Type*	Event Description		
1		N (BOP) N (SRO)	Shift Electro Hydraulic (EH) pumps		
2	XSI2PT5602		Containment pressure transmitter fails high. Tech Spec for SRO.		
3	CWS2P3AFLT	C (BOP) R (ATC) C (SRO)	'A' Circulating Water pump trip.		
4	CV48731	C (ATC) C (SRO)	VCT outlet valve fails to close.		
5	XRCCHAPLVL	I (ATC) I (SRO)	'A' Pressurizer Level Channel Fails Low. Tech Spec for SRO		
6	K01-A07 BUS2A1 BUS2A3 A309	M (ALL)	2A-1 bus negative sequence and lockout causing a reactor trip. Also, 2A-3 bus will lockout and the feeder breaker (2A-309) will remain closed.		
7	500LOSE500 500LOSE161 EFW2P7OS	M (ALL)	Loss of Offsite Power and 2P-7A EFW pump overspeed trips causing a complete loss of feedwater.		
8	HPI2P89FAL	C (BOP) C (SRO)	2P-89B High Pressure Safety Injection pump fails to start SIAS		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

Total malfunctions. = 6, Malfunctions after EOP entry = 2, Abnormal events = 2, Major transient = 2, EOPs with substantive actions = 2, EOP Contingencies = 1, Critical tasks = 3.

Facility: ANO-2		Scenario No.: 2 (New)		Op-Test No.: 2012-1	
Examiners:			Operators:		
Initial Conditions: 100% MOL; All Engineered Safety Features systems are in standby. #3 and #4 MTG control valve steam lead valves failed closed. 'B' SIT level is high due to inleakage. Voltage regulator auto tracking circuit is disabled. RED Train Maintenance Week.					
Turnover: 100%. 260 EFPD. EOOS indicates 'Minimal Risk'. #3 and #4 MTG control valve steam lead valves failed closed. Voltage regulator auto tracking circuit is disabled. RED Train Maintenance Week. Evolution scheduled: Drain of 'B' Safety Injection Tank to clear the High pressure alarm. OPS-B37 log is not required.					
Event No.	Malf. No.	Event Type*	Event Description		
1		N (BOP) N (SRO)	Drain 'B' Safety Injection Tank.		
2	XRC2PT46241		'A' channel wide range pressurizer pressure will fail low. Tech Spec for SRO.		
3	SDS0303DEM DI_HS_0303_1 DI_HS_0303_2	C(BOP) C(SRO)	2CV-0303 Turbine bypass demand fails high.		
4	SCRUNBACK	R (ATC) C (SRO)	Partial Stator water runback. Tech Spec for SRO.		
5	RCP2P32BGRN	M (ALL)	'B' Reactor Coolant Pump (RCP) trip.		
6	RPSRXAUTO	C (ATC) C (SRO)	Reactor Protection System auto trip failure.		
7	MS1003	M (ALL)	Main Steam Safety valve setpoint drifts causing an ESD.		
8	ESF1025 CV1038 MFWPMPBTRP	C (BOP) C (SRO)	EFW valve 2CV-1025-1 fails to auto close, and 2EFW-1038-2 failed open. 'B' Main feedwater pump trips to allow Steam Generator level to lower for Auto EFW actuation.		
9	CV4651	C (ATC) C (SRO)	'A' RCP spray valve failed closed. (Not credited as malfunction after EOP entry due to possibly being discovered prior to EOP entry)		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

Total malfunctions. = 7, Malfunctions after EOP entry = 2, Abnormal events = 2, Major transient = 2, EOPs with substantive actions = 1, EOP Contingencies = 0, Critical tasks = 2.

Facility: ANO-2		Scenario No.: 3 (New)		Op-Test No.: 2012-1	
Examiners:			Operators:		
Initial Conditions: ~4% MOL; All Engineered Safety Features systems are in standby. #3 and #4 MTG control valve steam lead valves failed open. Voltage regulator auto tracking circuit is disabled. RED Train Maintenance Week.					
Turnover: ~4%. 260 EFPD. EOOS indicates 'Minimal Risk'. #3 and #4 MTG control valve steam lead valves failed open. Voltage regulator auto tracking circuit is disabled. RED Train Maintenance Week. 2102.004 power operations section 8 complete up to step 8.8. Steps 8.3 and 8.4 continuous actions. Test Team will roll the turbine and sync to the grid at ~10% power. Steam Bypass valve 2CV-0303 is in auto and 2CV-0302 is in manual balancing condenser heat loads. Evolution scheduled: Commence Power Escalation @ <15%/Hr.					
Event No.	Malf. No.	Event Type*	Event Description		
1		R (ATC) N (BOP) N (SRO)	Commence Power escalation to 10% power for turbine sync.		
2	DI_HS_4966_1 DI_HS_4966_2 DO_HS_4966_G DO_HS_4966_R	C (ATC) C (SRO)	2P-109B reactor makeup water pump trips		
3	NIALINEPWR		'A' Nuclear Instrument (NI) fails high. Tech Spec for SRO.		
4	XCV2LT4861	I (ATC) I (SRO)	Volume Control Tank (VCT) level transmitter fails high.		
5	DI_C40_S72B ESFCIAS1 K04-C01 K07-C01	C(BOP) C(SRO)	Inadvertent Containment Isolation Actuation Signal (CIAS) on the Green Train. Tech Spec for SRO.		
6	RCP2P32DUPP RCP2P32DMID RCP2P32DLOW RCLOCATCD	M (ALL)	'D' RCP seals fail and a 180 gpm RCS leak starts.		
7	CEA15STUCK CEA31STUCK	C (ATC) C (SRO)	Control Element Assembly's (CEA) 15 and 31 fail to fully insert during the reactor trip.		
8	SIS2P89AX	C (BOP) C (SRO)	2P-89A High Pressure Safety Injection (HPSI) pump has degraded performance.		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

Total malfunctions. = 6, Malfunctions after EOP entry = 2, Abnormal events = 3, Major transient = 1, EOPs with substantive actions = 1, EOP Contingencies = 0, Critical tasks = 3.