Facility: Fort Calhoun Printed: 06/30/2005

Date Of Exam: 07/11/2005

Tier	Group	RO K/A Category Points												SRO-Only Points				
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	K	A	A2	G*	
1. Emergency & Abnormal Plant Evolutions	1	2	1	4				4	3			4	18	0	0	0	0	0
	2	1	3	1				2	0			2	9	0	0	0	0	0
	Tier Totals	3	4	5				6	3			6	27	0	0	0	0	0
2. Plant Systems	1	3	1	2	3	2	1	3	3	4	3	3	28	0	0	0	0	0
	2	2	1	1	0	0	2	1	1	0	1	1	10	0	0	0	0	0
	Tier Totals	5	2	3	3	2	3	4	4	4	4	4	38	0	0	0	0	0
3. Generic Knowledge And Abilities Categories					1		2		3		4		10	1	2	3	4	0
					3		2		2		3			0	0	0	0	

Note:

1. Ensure that at least two topics from every K/A category are sampled within each tier of the RO outline (i.e., the "Tier Totals" in each K/A category shall not be less than two). Refer to Section D.1.c for additional guidance regarding the SRO sampling.
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. Select topics from many systems and evolutions; avoid selecting more than two K/A topics from a given system unless they relate to plant-specific priorities.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category /tier.
6.* 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. The SRO K/As must also be linked to 10 CFR 55.43 or an SRO-level learning objective.
7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) 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 columns labeled "K" and "A". Use duplicate pages for RO and SRO-only exams.
8. For Tier 3, enter the K/A numbers, descriptions, importance ratings, and point totals on Form ES-401-3.
9. Refer to ES-401, Attachment 2, for guidance regarding the elimination of inappropriate K/A statements.

PWR RO Examination Outline

Printed: 06/30/2005

Facility: Fort Calhoun

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1** **Form ES-401-2**

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
000008 Pressurizer Vapor Space Accident / 3				X			AA1.06 - Control of PZR level	3.6	1
000009 Small Break LOCA / 3					X		EA2.08 - Letdown isolation valve position indication	2.9*	1
000011 Large Break LOCA / 3						X	2.4.6 - Knowledge symptom based EOP mitigation strategies.	3.1	1
000015 RCP Malfunctions / 4				X			AA1.16 - Low-power reactor trip block status lights	3.2*	1
000022 Loss of Rx Coolant Makeup / 2				X			AA1.03 - PZR level trend	3.2	1
000025 Loss of RHR System / 4		X					AK2.03 - Service water or closed cooling water pumps	2.7	1
000026 Loss of Component Cooling Water / 8			X				AK3.02 - The automatic actions (alignments) within the CCWS resulting from the actuation of the ESFAS	3.6	1
000027 Pressurizer Pressure Control System Malfunction / 3					X		AA2.18 - Operable control channel	3.4	1
000038 Steam Gen. Tube Rupture / 3	X						EK1.03 - Natural circulation	3.9	1
000054 Loss of Main Feedwater / 4						X	2.4.50 - Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	3.3	1
000055 Station Blackout / 6						X	2.1.23 - Ability to perform specific system and integrated plant procedures during all modes of plant operation.	3.9	1
000056 Loss of Off-site Power / 6				X			AA1.02 - ESF bus synchronization select switch to close bus tie breakers	4.0*	1
000057 Loss of Vital AC Inst. Bus / 6					X		AA2.03 - RPS panel alarm annunciators and trip indicators	3.7	1
000058 Loss of DC Power / 6						X	2.4.4 - Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.0	1
000062 Loss of Nuclear Svc Water / 4			X				AK3.02 - The automatic actions (alignments) within the nuclear service water resulting from the actuation of the ESFAS	3.6	1
000065 Loss of Instrument Air / 8			X				AK3.08 - Actions contained in EOP for loss of instrument air	3.7	1

PWR RO Examination Outline

Printed: 06/30/2005

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ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1** **Form ES-401-2**

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
CE/E02 Reactor Trip - Stabilization - Recovery / 1			X				EK3.1 - Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics	3.2	1
CE/E05 Steam Line Rupture - Excessive Heat Transfer / 4	X						EK1.1 - Components, capacity, and function of emergency systems	3.0	1
K/A Category Totals:	**2**	**1**	**4**	**4**	**3**	**4**	**Group Point Total:**		**18**

PWR RO Examination Outline

Printed: 06/30/2005

Facility: Fort Calhoun

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2** **Form ES-401-2**

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
000001 Continuous Rod Withdrawal / 1		X					AK2.08 - Individual rod display lights and indications	3.1	1
000024 Emergency Boration / 1	X						AK1.04 - Low temperature limits for boron concentration	2.8	1
000037 Steam Generator Tube Leak / 3				X			AA1.13 - S/G blowdown radiation monitors	3.9	1
000060 Accidental Gaseous Radwaste Rel. / 9		X					AK2.02 - Auxiliary building ventilation system	2.7	1
000068 Control Room Evac. / 8		X					AK2.02 - Reactor trip system	3.7	1
000074 Inad. Core Cooling / 4				X			EA1.05 - PORV	3.9	1
CE/A11 RCS Overcooling - PTS / 4						X	2.2.22 - Knowledge of limiting conditions for operations and safety limits.	3.4	1
CE/A16 Excess RCS Leakage / 2						X	2.1.30 - Ability to locate and operate components, including local controls.	3.9	1
CE/E09 Functional Recovery			X				EK3.2 - Normal, abnormal and emergency operating procedures associated with (Functional Recovery)	3.2	1
K/A Category Totals:	**1**	**3**	**1**	**2**	**0**	**2**	**Group Point Total:**		**9**

PWR RO Examination Outline

Printed: 06/30/2005

Facility: Fort Calhoun

ES - 401 **Plant Systems - Tier 2 / Group 1** **Form ES-401-2**

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
003 Reactor Coolant Pump							X					A1.08 - Seal water temperature	2.5	1
003 Reactor Coolant Pump									X			A3.04 - RCS flow	3.6	1
004 Chemical and Volume Control								X				A2.16 - T-ave. and T-ref. deviations	3.2	1
004 Chemical and Volume Control										X		A4.12 - Boration/dilution batch control	3.8	1
005 Residual Heat Removal				X								K4.02 - Modes of operation	3.2	1
005 Residual Heat Removal					X							K5.02 - Need for adequate subcooling	3.4	1
006 Emergency Core Cooling									X			A3.06 - Valve lineups	3.9	1
007 Pressurizer Relief/Quench Tank					X							K5.02 - Method of forming a steam bubble in the PZR	3.1	1
008 Component Cooling Water			X									K3.02 - CRDS	2.9	1
010 Pressurizer Pressure Control							X					A1.09 - Tail pipe temperature and acoustic monitors	3.4	1
012 Reactor Protection											X	2.1.32 - Ability to explain and apply all system limits and precautions.	3.4	1
013 Engineered Safety Features Actuation											X	2.1.2 - Knowledge of operator responsibilities during all modes of plant operation.	3.0	1
013 Engineered Safety Features Actuation	X											K1.12 - ED/G	4.1	1
022 Containment Cooling								X				A2.04 - Loss of service water	2.9*	1
026 Containment Spray	X											K1.02 - Cooling water	4.1	1
039 Main and Reheat Steam				X								K4.05 - Automatic isolation of steam line	3.7	1
059 Main Feedwater				X								K4.18 - Automatic feedwater reduction on plant trip	2.8*	1
059 Main Feedwater									X			A3.06 - Feedwater isolation	3.2*	1
061 Auxiliary/Emergency Feedwater							X					A1.04 - AFW source tank level	3.9	1
062 AC Electrical Distribution											X	2.4.50 - Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	3.3	1
063 DC Electrical Distribution										X		A4.03 - Battery discharge rate	3.0*	1
063 DC Electrical Distribution	X											K1.02 - AC electrical system	2.7	1

PWR RO Examination Outline

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ES - 401 **Plant Systems - Tier 2 / Group 1** **Form ES-401-2**

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
064 Emergency Diesel Generator						X						K6.07 - Air receivers	2.7	1
064 Emergency Diesel Generator								X				A2.11 - Conditions (minimum load) required for unloading an ED/G	2.6	1
073 Process Radiation Monitoring										X		A4.03 - Check source for operability demonstration	3.1	1
076 Service Water		X										K2.01 - Service water	2.7*	1
078 Instrument Air			X									K3.02 - Systems having pneumatic valves and controls	3.4	1
103 Containment									X			A3.01 - Containment isolation	3.9	1
K/A Category Totals:	**3**	**1**	**2**	**3**	**2**	**1**	**3**	**3**	**4**	**3**	**3**	**Group Point Total:**		**28**

PWR RO Examination Outline

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Facility: Fort Calhoun

ES - 401 **Plant Systems - Tier 2 / Group 2** **Form ES-401-2**

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
001 Control Rod Drive	X											K1.05 - NIS and RPS	4.5	1
002 Reactor Coolant						X						K6.03 - Reactor vessel level indication	3.1	1
011 Pressurizer Level Control		X										K2.01 - Charging pumps	3.1	1
014 Rod Position Indication										X		A4.02 - Control rod mode-select switch	3.4	1
017 In-core Temperature Monitor	X											K1.01 - Plant computer	3.2*	1
033 Spent Fuel Pool Cooling							X					A1.02 - Radiation monitoring systems	2.8	1
035 Steam Generator								X				A2.06 - Small break LOCA	4.5	1
041 Steam Dump/Turbine Bypass Control											X	2.4.4 - Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.0	1
045 Main Turbine Generator			X									K3.01 - Remainder of the plant	2.9	1
086 Fire Protection						X						K6.04 - Fire, smoke, and heat detectors	2.6	1
K/A Category Totals:	**2**	**1**	**1**	**0**	**0**	**2**	**1**	**1**	**0**	**1**	**1**	**Group Point Total:**		**10**

Generic Knowledge and Abilities Outline (Tier 3)

PWR RO Examination Outline

Printed: 06/30/2005

Facility: Fort Calhoun

Form ES-401-3

Generic Category	KA	KA Topic	Imp.	Points
Conduct of Operations	2.1.2	Knowledge of operator responsibilities during all modes of plant operation.	3.0	1
	2.1.3	Knowledge of shift turnover practices.	3.0	1
	2.1.29	Knowledge of how to conduct and verify valve lineups.	3.4	1
		Category Total:		**3**
Equipment Control	2.2.13	Knowledge of tagging and clearance procedures.	3.6	1
	2.2.30	Knowledge of RO duties in the control room during fuel handling such as alarms from fuel handling area, communication with fuel storage facility, systems operated from the control room in support of fueling operations, and supporting instrumentation.	3.5	1
		Category Total:		**2**
Radiation Control	2.3.1	Knowledge of 10 CFR: 20 and related facility radiation control requirements.	2.6	1
	2.3.2	Knowledge of facility ALARA program.	2.5	1
		Category Total:		**2**
Emergency Procedures/Plan	2.4.6	Knowledge symptom based EOP mitigation strategies.	3.1	1
	2.4.15	Knowledge of communications procedures associated with EOP implementation.	3.0	1
	2.4.23	Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.	2.8	1
		Category Total:		**3**
		Generic Total:		**10**

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Tier	Group	RO K/A Category Points												SRO-Only Points				
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	K	A	A2	G*	
1. Emergency & Abnormal Plant Evolutions	1	0	0	0				0	0			0	0	0	0	3	3	6
	2	0	0	0				0	0			0	0	0	0	3	1	4
	Tier Totals	0	0	0				0	0			0	0	0	0	6	4	10
2. Plant Systems	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	5
	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	3
	Tier Totals	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	4	8
3. Generic Knowledge And Abilities Categories					1		2		3		4		0	1	2	3	4	7
					0		0		0		0			2	2	1	2	

Note:

1. Ensure that at least two topics from every K/A category are sampled within each tier of the RO outline (i.e., the "Tier Totals" in each K/A category shall not be less than two). Refer to Section D.1.c for additional guidance regarding the SRO sampling.
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. Select topics from many systems and evolutions; avoid selecting more than two K/A topics from a given system unless they relate to plant-specific priorities.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category /tier.
6.* 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. The SRO K/As must also be linked to 10 CFR 55.43 or an SRO-level learning objective.
7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) 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 columns labeled "K" and "A". Use duplicate pages for RO and SRO-only exams.
8. For Tier 3, enter the K/A numbers, descriptions, importance ratings, and point totals on Form ES-401-3.
9. Refer to ES-401, Attachment 2, for guidance regarding the elimination of inappropriate K/A statements.

PWR SRO Examination Outline

Printed: 06/30/2005

Facility: Fort Calhoun

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1** **Form ES-401-2**

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
000009 Small Break LOCA / 3					X		EA2.25 - Reactor trip setpoints	4.1	1
000015 RCP Malfunctions / 4						X	2.1.32 - Ability to explain and apply all system limits and precautions.	3.8	1
000025 Loss of RHR System / 4					X		AA2.07 - Pump cavitation	3.7	1
000026 Loss of Component Cooling Water / 8					X		AA2.02 - The cause of possible CCW loss	3.6	1
000038 Steam Gen. Tube Rupture / 3						X	2.4.30 - Knowledge of which events related to system operations/status should be reported to outside agencies.	3.6	1
CE/E02 Reactor Trip - Stabilization - Recovery / 1						X	2.2.25 - Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	1
K/A Category Totals:	**0**	**0**	**0**	**0**	**3**	**3**	**Group Point Total:**		**6**

PWR SRO Examination Outline

Printed: 06/30/2005

Facility: Fort Calhoun

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2** **Form ES-401-2**

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
000068 Control Room Evac. / 8					X		AA2.10 - Source range count rate	4.4*	1
000074 Inad. Core Cooling / 4					X		EA2.02 - Availability of main or auxiliary feedwater	4.6	1
000076 High Reactor Coolant Activity / 9						X	2.1.14 - Knowledge of system status criteria which require the notification of plant personnel.	3.3	1
CE/E09 Functional Recovery					X		EA2.1 - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	4.4	1
K/A Category Totals:	**0**	**0**	**0**	**0**	**3**	**1**	**Group Point Total:**		**4**

PWR SRO Examination Outline

Printed: 06/30/2005

Facility: Fort Calhoun

ES - 401 **Plant Systems - Tier 2 / Group 1** **Form ES-401-2**

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
004 Chemical and Volume Control								X				A2.11 - Loss of IAS	4.2	1
006 Emergency Core Cooling											X	2.1.33 - Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.	4.0	1
062 AC Electrical Distribution								X				A2.09 - Consequences of exceeding current limitations	3.0*	1
063 DC Electrical Distribution											X	2.2.22 - Knowledge of limiting conditions for operations and safety limits.	4.1	1
103 Containment											X	2.1.32 - Ability to explain and apply all system limits and precautions.	3.8	1
K/A Category Totals:	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**3**	**Group Point Total:**		**5**

PWR SRO Examination Outline

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ES - 401 **Plant Systems - Tier 2 / Group 2** **Form ES-401-2**

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
001 Control Rod Drive								X				A2.13 - ATWS	4.6	1
002 Reactor Coolant											X	2.2.22 - Knowledge of limiting conditions for operations and safety limits.	4.1	1
034 Fuel Handling Equipment				X								K4.01 - Fuel protection from binding and dropping	3.4	1
K/A Category Totals:	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**Group Point Total:**		**3**

Generic Knowledge and Abilities Outline (Tier 3)

PWR SRO Examination Outline

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Form ES-401-3

Generic Category	KA	KA Topic	Imp.	Points
Conduct of Operations	2.1.4	Knowledge of shift staffing requirements.	3.4	1
	2.1.34	Ability to maintain primary and secondary plant chemistry within allowable limits.	2.9	1
		Category Total:		**2**
Equipment Control	2.2.5	Knowledge of the process for making changes in the facility as described in the safety analysis report.	2.7	1
	2.2.19	Knowledge of maintenance work order requirements.	3.1	1
		Category Total:		**2**
Radiation Control	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	3.3	1
		Category Total:		**1**
Emergency Procedures/Plan	2.4.29	Knowledge of the emergency plan.	4.0	1
	2.4.45	Ability to prioritize and interpret the significance of each annunciator or alarm.	3.6	1
		Category Total:		**2**
		Generic Total:		**7**

Facility: __Fort Calhoun_____ Date of Examination: __07/11/05___

Examination Level : RO Operating Test Number: _____

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M	Administrative JPM – Calculate shutdown margin with a known inoperable CEA K/A 2.1.7 (RO 3.7)
Conduct of Operations	N	Administrative JPM – Determine minimum HPSI flow required to remove decay heat following sump strainer blockage K/A 2.1.25 (RO 2.8)
Equipment Control	N	Administrative JPM - Verify boration path during plant shutdown conditions with equipment out of service K/A 2.2.24 (RO 2.6)
Radiation Control	M	Administrative JPM – RCA Entry and Exit (Discover spill of potentially radioactive liquid) K/A 2.3.1 (RO 2.6) (Conducted in Radiation Worker Training Facility)
Emergency 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
(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)
(S)imulator

Facility: __Fort Calhoun_____ Date of Examination: __07/11/05___

Examination Level : SRO Operating Test Number: _____

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M	Administrative JPM – Review shutdown margin calculation with boron depletion K/A 2.1.7 (SRO 3.7)
Conduct of Operations	D	Administrative JPM – Determine equipment operability requirements during mode transition K/A 2.1.22 (SRO 3.3)
Equipment Control	M	Administrative JPM – Review required shift surveillance OP-ST-SHIFT-0001 K/A 2.2.12 (SRO 3.4)
Radiation Control	N	Administrative JPM – Authorize Waste Gas Decay Tank Release K/A 2.3.6 (SRO 3.1)
Emergency Plan	M	Administrative JPM – Classify Event and make Protective Action Recommendations K/A 2.4.41 (SRO 4.1), K/A 2.4.44 (SRO 4.0)

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
(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)
(S)imulator

Facility: __Fort Calhoun _____ Date of Examination: ___07/11/05____

Exam Level : RO Operating Test No.: _____

Control Room Systems@ (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)

System / JPM Title	Type Code*	Safety Function
a. 006 / JPM-0329 Fill Safety Injection Tank K/A 006000 A3.01 (RO 4.0 / SRO 3.9)	S , D	2
b. 022 / JPM-0718 Place Containment Cooling Unit in Service K/A 022000 A4.01 (RO 3.6 / SRO 3.6)	S , D	5
c. 012 / JPM-0778 Adjust T-Cold Calibration K/A 012000 A1.01 (RO 2.9 / SRO 3.4)	S , D	7
d. 086 JPM-0726 Restore CR Ventilation following smoke alarm K/A 000067 AA1.05 (RO 3.0 / SRO 3.1)	S, D, A	9
e. 062 / JPM-0042 Transfer Clutch Power Supply/x-tie inst busses K/A 062000 A2.10 (RO 3.0 / SRO 3.3)	S, M, A	6
f. 003 / JPM-0613A Shutdown a Reactor Coolant Pump K/A 003000 A4.06 (RO 2.9 / SRO 2.9)	S, D, A, L	4P
g. 061 / JPM-R AFW Operability Verification From AI-179 K/A 061000 K1.01 (RO 4.1 / SRO 4.1)	S, N, L	4S
h. 003 / JPM-0627 Reduce RCS Pressure using Auxiliary Spray K/A 010000 A4.01 (RO 3.7 / SRO 3.5)	S, N, A	3
In-Plant Systems@ (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)		
i. 078 / JPM-0225 Air Compressor Backup Cooling K/A 078000 K1.04 (RO 2.6 / SRO 2.9)	M, E	8
j. 064 / JPM-0356 Local Emergency Start of a Diesel Generator K/A 064000 A4.06 (RO 3.9 / SRO 3.9)	N, A, E	6
k. 028 / JPM-0719M Startup Containment Hydrogen Purge and Makeup K/A 068000 A3.02 (RO 3.6 / SRO 3.6)	M, R, E	5

@ All control room (and in-plant) systems must be different and 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
(L)ow-Power	≥ 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: __Fort Calhoun _____ Date of Examination: ___07/11/05____

Exam Level : ISRO Operating Test No.: _____

Control Room Systems@ (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)

System / JPM Title	Type Code*	Safety Function
a. 006 / JPM-0329 Fill Safety Injection Tank K/A 006000 A3.01 (RO 4.0 / SRO 3.9)	S , D	2
b. 022 / JPM-0718 Place Containment Cooling Unit in Service K/A 022000 A4.01 (RO 3.6 / SRO 3.6)	S , D	5
c.		
d. 086 JPM-0726 Restore CR Ventilation following smoke alarm K/A 000067 AA1.05 (RO 3.0 / SRO 3.1)	S, D, A	9
e. 062 / JPM-0042 Transfer Clutch Power Supply/x-tie inst busses K/A 062000 A2.10 (RO 3.0 / SRO 3.3)	S, M, A	6
f. 003 / JPM-0613A Shutdown a Reactor Coolant Pump K/A 003000 A4.06 (RO 2.9 / SRO 2.9)	S, D, A, L	4P
g. 061 / JPM-R AFW Operability Verification From AI-179 K/A 061000 K1.01 (RO 4.1 / SRO 4.1)	S, N, L	4S
h. 003 / JPM-0627 Reduce RCS Pressure using Auxiliary Spray K/A 010000 A4.01 (RO 3.7 / SRO 3.5)	S, N, A	3
In-Plant Systems@ (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)		
i. 078 / JPM-0225 Air Compressor Backup Cooling K/A 078000 K1.04 (RO 2.6 / SRO 2.9)	M, E	8
j. 064 / JPM-0356 Local Emergency Start of a Diesel Generator K/A 064000 A4.06 (RO 3.9 / SRO 3.9)	N, A, E	6
k. 028 / JPM-0719M Startup Containment Hydrogen Purge and Makeup K/A 068000 A3.02 (RO 3.6 / SRO 3.6)	M, R, E	5

@ All control room (and in-plant) systems must be different and 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
(L)ow-Power	≥ 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: __Fort Calhoun _____ Date of Examination: ___07/11/05____

Exam Level : USRO Operating Test No.: _____

Control Room Systems@ (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)

System / JPM Title	Type Code*	Safety Function
a.		
b.		
c.		
d. 086 JPM-0726 Restore CR Ventilation following smoke alarm K/A 000067 AA1.05 (RO 3.0 / SRO 3.1)	S, D, A	9
e.		
f.		
g. 061 / JPM-R AFW Operability Verification From AI-179 K/A 061000 K1.01 (RO 4.1 / SRO 4.1)	S, N, L	4S
h.		

In-Plant Systems@ (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)

i. 078 / JPM-0225 Air Compressor Backup Cooling K/A 078000 K1.04 (RO 2.6 / SRO 2.9)	M, E	8
j. 064 / JPM-0356 Local Emergency Start of a Diesel Generator K/A 064000 A4.06 (RO 3.9 / SRO 3.9)	N, A, E	6
k. 028 / JPM-0719M Startup Containment Hydrogen Purge and Makeup K/A 068000 A3.02 (RO 3.6 / SRO 3.6)	M, R, E	5

@ All control room (and in-plant) systems must be different and 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
(L)ow-Power	≥ 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: Fort Calhoun	Scenario No: 2005 - 1	Op-Test No. _____

Examiners: _____
_____
_____

Operators: _____
_____
_____

Initial Conditions: 100% Power IC#1

{ Preset malfunctions: COP RCAF2U1 0%, COP RCAF2U2 0%, MFP EHC02, MFP ESF02A OFF, MFP ESF02B OFF}
Place protected equipment tags on FW-6 and FW-10. Cover simulator fidelity items.

Turnover: CCW-Pump, AC-3A and Diesel Driven AFW pump FW-54 are tagged out of service
Maintain Power Operations

Event No.	Malf No.	Event Type*	Event Description
1 (3:00)	COP T:F212 160	I - ATC	Letdown flow transmitter fails high – letdown isolates
2 (12:00)	COP T:L903X 0% 60 sec ramp	I - BOP	S/G "A" level transmitter fails low – manual FW flow control required
3 (18:00)	COP NCAPCA1C TRIP	C - BOP	IA Compressor trips, standby does not load
4 (24:00)	MFP CRD06 R1G1 Deenergized	C – ATC	Dropped CEA – T/S Entry
5	N/A	R – ATC N - BOP	TS Required power reduction to 70%
6 (40:00)	MFP EDS04B	C - ATC	Instrument Bus Fails – T/S Entry
7 (50:00)	MSS01A 20% 2 min ramp	M - ALL	Main steam line break inside containment
8	Preset	C - BOP	Turbine fails to trip
9	Preset	I – ATC or BOP	CPHS Fails to Actuate

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

Facility: Fort Calhoun	Scenario No: 2005 - 2	Op-Test No. _____
Examiners: _____ _____ _____	Operators: _____ _____ _____	

Initial Conditions: 100% Power (IC#1)

{PRESET MFP CRD05I untrip, MFP CRD05H untrip, COP T:R057 69, Start CH-1B, Stop CH-1C)
Hang protected equipment tags on FW-6 and FW-10.

Turnover: CCW-Pump, AC-3A and Diesel Driven AFW pump FW-54 are tagged out of service
Maintain Power Operations

Event No.	Malf No.	Event Type*	Event Description
1 (3:00)	MFP NIS04C	I - ATC	Power Range NI Channel "C" Fails – T/S entry
2 (10:00)	COP T:L906X 55%	I - BOP	S/G "B" level transmitter fails to 55%
3 (16:00)	COP NBWPAC9 A trip	C - BOP	Bearing Water Pump AC-9A Trips
4 (20:00)	T:T122H2 665°F	I -ATC	RCS T-hot fails – T/S entry
5 (30:00)	MFP CVC16B	C - ATC	Charging Pump CH-1B degraded performance
6 (40:00)	MFP SGN01A 15% 120s ramp	M - ALL	Steam Generator Tube Rupture
7	Preset	R - ATC	2 CEAs fail to insert – Emergency Boration Required
8	Preset	I - BOP	RM-057 (Condenser offgas radiation monitor) fails "as is" (Aux Steam Isolation valve, RC-978, does not get close signal)

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

Facility: Fort Calhoun	Scenario No: 2005 - 3	Op-Test No. _____

Examiners: _____
_____
_____

Operators: _____
_____
_____

Initial Conditions: 49% Power (IC#4)

{PRESET RFP CWS10N CLOSED} {Power 1A1 and 1A2 from 22KV, S/D CH-1A)
Protected equipment tag on FW-5B
RunScreens file

Turnover: Heater Drain pumps FW- 5A and FW-5C are tagged out of service. Power held at 50% pending repair of at least one of the heater drain pumps. PCMINT is not available.

Event No.	Malf No.	Event Type*	Event Description
1 (3:00)	MFP DSG06A 100%	C – ATC or BOP	D/G #1 Radiator Leak – T/S Entry
2 (12:00)	COP T:P910 1000 psi	I - BOP	PT-910 Fails High
3 (18:00)	COP T:T2897 50°F	I - ATC	Letdown heat exchanger temperature transmitter fails low
4 (25:00)	MFP SWD02B	C - BOP	Loss of 161 KV – T/S Entry
5 (35:00)	COP T:P103Y 2556 90 sec ramp	I - ATC	Pressurizer pressure transmitter PT-103Y fails high
6 (40:00)	COP T: L906Y 100% 60 sec ramp	I - BOP	S/G “B” level transmitter LT-906Y fails high (Manual control using Aux controller required)
7 (45:00)	MFP RWS01B 25%	C - ATC	Raw Water header leak
8 (55:00)	MFP RCS01C 5%	M - ALL	LOCA with Loss of offsite power
9	Preset	C-BOP	Circulating Water Pump Breaker does not open so the D/G breaker does not close.

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

Facility: Fort Calhoun	Scenario No: 2005 – 4 (spare)	Op-Test No. _____

Examiners: _____
_____
_____

Operators: _____
_____
_____

Initial Conditions: 49% Power

{Preset MSS02F 100% E1 30 sec delay} { Place 1A1 and 1A2 on 22 KV, S/D CH-1A}
Protected equipment tags on FW-5B

Turnover: Heater Drain pumps FW- 5A and FW-5C are tagged out of service. Power held at 50% pending repair of at least one of the heater drain pumps. PCMINT is not available.

Event No.	Malf No.	Event Type*	Event Description
1 (3:00)	COP JLB218LL Fail_set	I - ATC	VCT Level Transmitter Fails Low
2 (8:00)	COP T:L903X 100% 45 sec ramp	I - BOP	S/G "A" Level transmitter fails high
3 (15:00)	COP T:F114YA 0	I - ATC	RCS Flow transmitter failure – T/S Entry
4 (22:00)	MFP AFW05A	I - BOP	Inadvertent AFAS actuation – T/S Entry
5 (30:00)	COP RCAP 849A&B 0%	C - ATC	Instrument air to containment isolates
6 (40:00)	MFP CND01 30% 300 sec ramp	C - BOP	Loss of condenser vacuum
7	N/A	M - ALL	Reactor Trip – no steam dump and bypass valves
8	Preset	C - BOP	S/G safety valve sticks open

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

List of Outline changes from initial to final outline

WHAT CHANGED?	CHANGE	Reason for Change
RO form ES-401-2	Replaced K/A 000027 AA2.07 with 000027 AA2.18	No connection between K/A event and K/A item
	Replaced K/A 000057 AA2.01 with 000057 AA2.03	Operators not expected to know by memory. Providing reference would be direct lookup.
SRO form ES-401-4	Removed K/A 062000 A2.09 from rejected K/A list.	Discussion with Lead Examiner
SRO form ES-401-2	Replaced K/A 007000 A2.05 with 062000 A2.09 (Tier 2/Group 1)	Added previously rejected K/A back into exam (see above)
RO ES-301-2	Replaced Transfer Waste Gas JPM	Lead Examiner Request
	Modified JPM-0042 to an alternate path and renamed it	Too simple as written
	Changed JPM-0613A from “M” to “D”	correction
	Changed JPM-0627 to “A”	correction
	Changed safety function on JPM d from 8 to 9	correction
	Replaced JPM g with new JPM	Exam security
SRO-I ES-301-2	Replaced Transfer Waste Gas JPM	Lead Examiner Request
	Replaced JPM-0778 with JPM-0042	To prevent overlap with Administrative JPM
	Modified JPM-0042 to an alternate path and renamed it	Too simple as written
	Changed JPM-0613A from “M” to “D”	correction

	Changed JPM-0627 to “A”	correction
	Changed safety function on JPM d from 8 to 9	correction
	Replaced JPM g with new JPM	Exam security
SRO-U ES-301-2	Replaced Transfer Waste Gas JPM	Lead Examiner Request
	Changed JPM-0613A from “M” to “D”	correction
	Replaced JPM f with JPM d	Lead Examiner Request
	Replaced JPM g with new JPM	Exam security
SRO Form ES-301-1	Changed review SDM JPM from SDM with inoperable CEA to SDM with boron depletion	Review SDM with inoperable CEA was used on last SRO exam
Form ES-D-1 scenario 1	Changed event 2 from S/G pressure transmitter to S/G level.	Automatic control system handles failure without operator action
Form ES-D-1 scenario 2	Changed event 2 from S/G flow transmitter to S/G level.	Automatic control system handles failure without operator action
Form ES-D-1 scenario 4 (spare)	Changed event 2 from S/G pressure transmitter to S/G level.	Automatic control system handles failure without operator action