

Facility: Callaway		Date of Exam: August 2002						Exam Level: SRO					
Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	5	4	3				4	3			5	24
	2	2	1	3				2	6			2	16
	3	0	0	0				1	0			2	3
	Tier Totals	7	5	6				7	9			9	43
2. Plant Systems	1	2	1	0	2	2	2	2	2	1	1	4	19
	2	1	1	2	1	0	1	1	4	2	2	2	17
	3	0	0	2	0	0	0	0	1	0	0	1	4
	Tier Totals	3	2	4	3	2	3	3	7	3	3	7	40
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		17
					5		4		3		5		

- Note:
1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., 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  $\pm 1$  from that specified in the table based on NRC revisions. The final exam must total 100 points.
  3. Select topics from many systems; avoid selecting more than two or three 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 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.
  7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the SRO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the

table above.

ES-401		Callaway 2002 SRO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1							Form ES-401-3	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#	
000001	Continuous Rod Withdrawal / 1			X			AK3.02 Tech Spec Limits For Control Rods	4.3	S001	
000003	Dropped Control Rod / 1	X					AK1.11 Long Term Effect Of Dropped Rod	3.5	B017	
000005	Inoperable / Stuck Control Rod / 1				X		AA1.01 Inoperable Rod - Malfunctioning Coil Currents	3.4	B001	
000011	Large Break LOCA / 3				X		EA1.13 Manually Align ECCS Components (IPE/PRA)	4.2	B021	
W/E04	LOCA Outside Containment / 3	X					EK1.2 Precaution During Valve Strokes In ECA-1.2	4.2	B022	
W/E02	SI Termination / 3		X				EK2.2 Primary Coolant Indication For SI Termination	3.9	B024	
000015/17	RCP Malfunctions / 4					X	2.1.32 RCP Starting Limitations	3.8	B002	
W/E09&E10	Natural Circ. / 4	X					EK1.3 Natural Circulation Indications (IPE/PRA)	3.6	B003	
000024	Emergency Boration / 1					X	2.4.4 OTO-ZZ-00003 Entry Conditions	4.3	B004	
000026	Loss of Component Cooling Water / 8			X			AK3.03 Loss of CCW Pump - Operator Actions	4.2	B005	
000029	Anticipated Transient w/o Scram / 1					X	2.4.16 ATWS Coincident With SI	4.0	S002	
000040 (W/E12)	Steam Line Rupture – Excessive Heat Transfer / 4	X					AK1.06 Steam Line Break Outside CTMT	3.8	B007	
W/E08	RCS Overcooling - PTS / 4				X		EA1.3 RCS Post-Soak C/D Limits Following PTS	4.0	B008	
000051	Loss of Condenser Vacuum / 4			X			AK3.01 Loss of Steam Dumps With Loss Of Vacuum	3.1	B009	
000055	Station Blackout / 6	X					EK1.01 Battery Discharge Rate (IPE/PRA)	3.7	B010	
000057	Loss of Vital AC Elec. Inst. Bus / 6					X	AA2.19 Auto Actions On Loss Of NN02	4.3	B011	
000059	Accidental Liquid Radwaste Rel. / 9					X	AA2.02 LRW Release Permit	3.9	S003	
000062	Loss of Nuclear Service Water / 4					X	2.2.25 ESW Tech Spec Bases	3.7	S004	

ES-401		Callaway 2002 SRO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1							Form ES-401-3		
E/APE # / Name / Safety Function		K1	K2	K3	A1	A2	G	K/A Topic(s)		Imp.	Q#
000067	Plant Fire On-site / 9				X			AA1.08	Fire In NB01 Switchgear	3.7	B012
000068	Control Room Evac. / 8		X					AK2.02	Activating RPS From Outside The Control Room	3.9	B013
000069 (W/E14)	Loss of CTMT Integrity / 5						X	2.1.12	CTMT Integrity Tech Spec	4.0	S005
			X					EK2.1	Manual Actions On High CTMT Pressure	3.7	B014
000074 (W/E06&E07)	Inad. Core Cooling / 4		X					EK2.2	RCP Requirements For Inadequate Core Cooling	4.1	B015
000076	High Reactor Coolant Activity / 9					X		AA2.02	High RCS Activity Sampling Requirements	3.4	B016
K/A Category Point Totals:		5	4	3	4	3	5	Group Point Total:			24

ES-401		Callaway 2002 SRO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2							Form ES-401-3	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#	
000007	Reactor Trip – Stabilization – Recovery /1	X					EK1.05 How Long For Source Ranges To Energize On Rx Trip	3.8	B018	
000008	Pressurizer Vapor Space Accident / 3		X				AK2.02 Indication Of Stuck Open Pzr Safety	2.7	B019	
000009	Small Break LOCA / 3				X		EA1.04 Indications Of Small LOCA In CVCS (IPE/PRA)	3.5	B020	
W/E03	LOCA Cooldown-Depress. / 4	X					EK1.2 ES-1.2 RNO Actions	4.1	B023	
W/E11	Loss of Emergency Coolant Recirc / 4					X	EA2.1 Transition To Loss Of Emergency Coolant Recirc (IPE/PRA)	4.2	S006	
000022	Loss of Reactor Coolant Makeup / 2			X			AK3.02 Valve Closure In Charging Line	3.8	B025	
000025	Loss of RHR System / 4				X		AA1.02 Loss Of RHR At Mid-Loop	3.9	B026	
000027	Pressurizer Pressure Control System Malfunction / 3					X	AA2.16 Pzr Pressure Instrument Fails Low	3.9	B006	
000032	Loss of Source Range NI / 7					X	2.4.11 Loss Of Source Range Due To P-10	3.6	B027	
000033	Loss of Intermediate Range NI / 7					X	AA2.02 Indication Of IR Channel Failure	3.6	B028	
000037	Steam Generator Tube Leak / 3					X	2.4.11 Quantify S/G Tube Leak	3.6	B029	
000038	Steam Generator Tube Rupture / 3			X			EK3.06 Ruptured S/G Depressurization Methods (IPE/PRA)	4.5	B030	
000054	Loss of Main Feedwater / 4			X			AK3.04 Immediate Actions For MFP Trip	4.6	B031	
000058	Loss of DC Power / 6					X	AA2.03 Loss Of DC Power For Failed Flash	3.9	B032	
W/E16	High Containment Radiation / 9					X	EA2.1 Response To High CTMT Radiation	3.3	S007	
000065	Loss Of Instrument Air / 8					X	AA2.08 Failure Mode Of EFHV43/44	3.3	B034	
K/A Category Point Totals:		2	1	3	2	6	2	Group Point Total:	16	

ES-401		Callaway 2002 SRO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1 / Group 3							Form ES-401-3	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#	
000028 Pressurizer Level Malfunction / 2				X			AA1.02 Effect Of Pzr Level Channel Failure On RMCS	3.4	B033	
000036 Fuel Handling Accident / 8						X	2.2.25 Fuel Handling Tech Spec Bases	3.7	S008	
000056 Loss Of Off-Site Power / 6						X	2.4.21 CSF Status During Loss Of Off-Site Power	4.3	S009	
<b>K/A Category Point Totals:</b>	0	0	0	1	0	2	<b>Group Point Total:</b>		3	

ES-401	Callaway 2002 SRO Examination Outline Plant Systems - Tier 2 / Group 1											Form ES-401-3		
E/APE # / Name / Safety Function	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Q#
001 Control Rod Drive					X							K5.04 Rod Insertion Limit / P/A Converter Malfunction	4.7	B035
003 Reactor Coolant Pump							X					A1.07 Securing RCP At Power	3.4	B036
004 Chemical and Volume Control						X						K6.13 Boration Control Malfunction	3.3	B037
013 Engineered Safety Features Actuation								X				A2.01 ESFAS Response To LOCA	4.8	B038
014 Rod Position Indication								X				A2.03 Multiple Dropped Rods	4.1	S010
015 Nuclear Instrumentation											X	2.1.12 QPTR Tech Spec	4.0	S011
017 In-core Temperature Monitor				X								K4.01 CET Input To Subcooling Monitor	3.7	B039
022 Containment Cooling		X										K2.01 Containment Coolers Power Supply	3.1	B040
										X		A4.01 CTMT Cooler Operation On SI	3.6	B041
026 Containment Spray									X			A3.01 CTMT Spray Pump Response To LOCA	4.5	B053
056 Condensate	X											K1.03 MFW Temperature Response To LP Htr Isolation	2.6	B042
059 Main Feedwater	X											K1.04 S/G Water Level Control	3.4	B043
							X					A1.07 MFP Speed Change Due To AEPT508 Failure	2.6	B044
061 Auxiliary/Emergency Feedwater					X							K5.01 Relationship Between AFW Flow And RCS heat Transfer	3.9	B045
											X	2.2.25 CST Tech Spec Bases	3.7	S012
063 DC Electrical Distribution											X	2.2.22 125 VDC Tech Spec	4.1	S013
068 Liquid Radwaste						X						K6.10 LRW Discharge With Inoperable Monitor	2.9	B046

ES-401	Callaway 2002 SRO Examination Outline Plant Systems - Tier 2 / Group 1											Form ES-401-3		
E/APE # / Name / Safety Function	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Q#
071 Waste Gas Disposal				X								K4.04 Automatic Action On High Radiation	3.4	B047
072 Area Radiation Monitoring											X	2.2.22 Fuel Handling ARM Required By FSAR	4.1	B048
K/A Category Totals:	2	1	0	2	2	2	2	2	1	1	4	Group Point Total:		19



ES-401		Callaway 2002 SRO Examination Outline Plant Systems - Tier 2 / Group 2											Form ES-401-3			
E/APE # / Name / Safety Function		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)		Imp.	Q#
002	Reactor Coolant									X			A3.03	Master Pzr Press Controller Setting	4.6	B049
006	Emergency Core Cooling										X		A4.02	ECCS Valve Interlocks	3.8	B050
010	Pressurizer Pressure Control							X					A1.08	Spray Nozzle ΔT Limits	3.3	B051
011	Pressurizer Level Control								X				A2.03	Response To Pzr Level Malfunction	3.9	S014
012	Reactor Protection								X				A2.01	Multiple Rx Prot Channel Failures	3.6	S015
016	Non-nuclear Instrumentation			X									K3.03	Steam Dump Response To ABPT507 Failure	3.1	B052
029	Containment Purge								X				A2.04	HP Sampling Requirements For Release Permit	3.2	S016
033	Spent Fuel Pool Cooling				X								K4.05	SFP Dilution - Shutdown Margin	3.3	B054
034	Fuel Handling Equipment								X				A2.02	Dropped Fuel Cask	3.9	S017
035	Steam Generator						X						K6.01	Inadvertent Main Steam Line Isolation	3.6	B055
039	Main and Reheat Steam			X									K3.04	MFW Pump Discharge Pressure During Transient	2.6	B056
062	AC Electrical Distribution		X										K2.01	Loss Of Startup Transformer	3.4	B057
064	Emergency Diesel Generator									X			A3.07	Load Sequencing During SI	3.7	B058
073	Process Radiation Monitoring	X											K1.01	Response To CCW Rad Mon Alarm	3.9	B059
079	Station Air										X		A4.01	Loss Of Instrument Air Pressure	2.7	B060
086	Fire Protection											X	2.4.27	Actions Upon Discovery Of Fire	3.5	B061
103	Containment											X	2.1.33	Loss Of CTMT Integrity	4.0	S018
K/A Category Totals:		1	1	2	1	0	1	1	4	2	2	2	Group Point Total:			17

ES-401	Callaway 2002 SRO Examination Outline Plant Systems - Tier 2 / Group 3													Form ES-401-3	
E/APE # / Name / Safety Function	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)		Imp.	Q#
005 Residual Heat Removal								X				A2.02	RHR Overpressure Protection	3.7	S019
008 Component Cooling Water			X									K3.02	Control Rod Response To CCW Dilution	3.1	B062
076 Service Water											X	2.1.12	Inoperable ESW Trains	4.0	S020
078 Instrument Air			X									K3.02	RHR System Air Operated Valves	3.6	B063
K/A Category Point Totals:	0	0	2	0	0	0	0	1	0	0	1	Group Point Total:			4
Plant-Specific Priorities															
System / Topic	Recommended Replacement for										Reason			Points	
Plant-Specific Priority Total: (limit 10)															

ES-401

Callaway 2002 SRO Examination Outline  
Generic Knowledge and Abilities Outline (Tier 3)

Form ES-401-5

Facility: Callaway		Date of Exam: August 2002		Exam Level: SRO	
Category	K/A #	Topic	Imp.	Q#	
Conduct of Operations	2.1.1	License Candidate Requirements In Main CR	3.8	B064	
	2.1.11	Minimum Temp For Criticality T/S	3.8	B065	
	2.1.18	RO Log Entries	3.0	B066	
	2.1.26	Confined Space Entry Requirements	2.6	S021	
	2.1.32	Precautions And Limitations For Radwaste Supply	3.8	B067	
	Total			5	
Equipment Control	2.2.11	Continuous Use Procedure Adherence	3.4	B068	
	2.2.13	Operation Of Equipment Under Local Control Tag	3.8	B069	
	2.2.22	LCO For Refueling Water Storage Tank	4.1	B070	
	2.2.33	Rod Bank Overlap	2.9	B071	
	2.2.				
	Total			4	
Radiation Control	2.3.1	Radiological Posting	3.0	B072	
	2.3.10	CTMT Entry Requirements	3.3	S022	
	2.3.11	Release Termination On Ruptured And Faulted S/G	3.2	B073	
	2.3.				
	Total			3	
Emergency Procedures/ Plan	2.4.7	ECA-0.0 Mitigation Strategy	3.8	S023	
	2.4.20	AFW Flow / S/G Level Requirements With Adverse Containment	4.0	B074	
	2.4.22	CSF Implementation Requirements	4.0	S024	
	2.4.23	Prioritization Of Emergency Operating Procedures	3.8	B075	
	2.4.29	Emergency Response Data System	4.0	S025	
	2.4.				
	Total			5	
Tier 3 Point Total SRO				17	

Facility: Callaway		Date of Exam: August 2002						Exam Level: RO					
Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	3	3	2				3	3			2	16
	2	4	2	3				3	2			3	17
	3	0	0	1				1	1			0	3
	Tier Totals	7	5	6				7	6			5	36
2. Plant Systems	1	2	1	1	4	3	3	2	3	2	1	1	23
	2	1	1	4	3	1	1	1	1	3	3	1	20
	3	0	1	2	0	0	0	1	1	1	1	1	8
	Tier Totals	3	3	7	7	4	4	4	5	6	5	3	51
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		13
					4		4		2		3		
<p>Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).</p> <p>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 exam must total 100 points.</p> <p>3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.</p> <p>4. Systems/evolutions within each group are identified on the associated outline.</p> <p>5. The shaded areas are not applicable to the category/tier.</p> <p>6.* The generic 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.</p> <p>7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the</p>													

ES-401

Callaway 2002 RO Examination Outline

Form ES-401-4

basis of plant-specific priorities. Enter the tier totals for each category in the table above.

ES-401		Callaway 2002 RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1							Form ES-401-4	
E/APE # / Name / Safety Function		K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#
000005	Inoperable / Stuck Control Rod / 1				X			AA1.01 Inoperable Rod - Malfunctioning Coil Currents	3.6	B001
000015/17	RCP Malfunctions / 4						X	2.1.32 RCP Starting Limitations	3.4	B002
W/E09&E10	Natural Circ. / 4	X						EK1.3 Natural Circulation Indications (IPE/PRA)	3.3	B003
000024	Emergency Boration / 1						X	2.4.4 OTO-ZZ-00003 Entry Conditions	4.0	B004
000026	Loss of Component Cooling Water / 8			X				AK3.03 Loss of CCW Pump - Operator Actions	4.0	B005
000027	Pressurizer Pressure Control System Malfunction / 3					X		AA2.16 Pzr Pressure Instrument Fails Low	3.6	B006
000040 (W/E12)	Steam Line Rupture – Excessive Heat Transfer / 4	X						AK1.06 Steam Line Break Outside CTMT	3.7	B007
W/E08	RCS Overcooling - PTS / 4				X			EA1.3 RCS Post-Soak C/D Limits Following PTS	3.6	B008
000051	Loss of Condenser Vacuum / 4			X				AK3.01 Loss of Steam Dumps With Loss Of Vacuum	2.8	B009
000055	Station Blackout / 6	X						EK1.01 Battery Discharge Rate (IPE/PRA)	3.3	B010
000057	Loss of Vital AC Elec. Inst. Bus / 6					X		AA2.19 Auto Actions On Loss Of NN02	4.0	B011
000067	Plant Fire On-site / 9				X			AA1.08 Fire In NB01 Switchgear	3.4	B012
000068	Control Room Evac. / 8		X					AK2.02 Activating RPS From Outside The Control Room	3.7	B013
000069 (W/E14)	Loss of CTMT Integrity / 5		X					EK2.1 Manual Actions On High CTMT Pressure	3.4	B014
000074 (W/E06&E07)	Inad. Core Cooling / 4		X					EK2.2 RCP Requirements For Inadequate Core Cooling	3.8	B015
000076	High Reactor Coolant Activity / 9					X		AA2.02 High RCS Activity Sampling Requirements	2.8	B016

K/A Category Point Totals:	3	3	2	3	3	2	Group Point Total:	16
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ES-401		Callaway 2002 RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2							Form ES-401-4	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#	
000003	Dropped Control Rod / 1	X					AK1.11 Long Term Effect Of Dropped Rod	2.5	B017	
000007	Reactor Trip – Stabilization – Recovery /1	X					EK1.05 How Long For Source Ranges To Energize On Rx Trip	3.3	B018	
000008	Pressurizer Vapor Space Accident / 3		X				AK2.02 Indication Of Stuck Open Pzr Safety	2.7	B019	
000009	Small Break LOCA / 3				X		EA1.04 Indications Of Small LOCA In CVCS (IPE/PRA)	3.7	B020	
000011	Large Break LOCA / 3				X		EA1.13 Manually Align ECCS Components (IPE/PRA)	4.1	B021	
W/E04	LOCA Outside Containment / 3	X					EK1.2 Precaution During Valve Strokes In ECA-1.2	3.5	B022	
W/E03	LOCA Cooldown/Depress. / 4	X					EK1.2 ES-1.2 RNO Actions	3.6	B023	
W/E02	SI Termination / 3		X				EK2.2 Primary Coolant Indication For SI Termination	3.5	B024	
000022	Loss of Reactor Coolant Makeup / 2			X			AK3.02 Valve Closure In Charging Line	3.5	B025	
000025	Loss of RHR System / 4				X		AA1.02 Loss Of RHR At Mid-Loop	3.8	B026	
000029	Anticipated Transient w/o Scram / 1					X	2.4.1 ATWS Immediate Actions	4.3	R001	
000032	Loss of Source Range NI / 7					X	2.4.11 Loss Of Source Range Due To P-10	3.4	B027	
000033	Loss of Intermediate Range NI / 7					X	AA2.02 Indication Of IR Channel Failure	3.3	B028	
000037	Steam Generator Tube Leak / 3					X	2.4.11 Quantify S/G Tube Leak	3.4	B029	
000038	Steam Generator Tube Rupture / 3			X			EK3.06 Ruptured S/G Depressurization Methods (IPE/PRA)	4.2	B030	
000054	Loss of Main Feedwater / 4			X			AK3.04 Immediate Actions For MFP Trip	4.4	B031	
000058	Loss of DC Power / 6					X	AA2.03 Loss Of DC Power For Field Flash	3.5	B032	
K/A Category Point Totals:		4	2	3	3	2	3	Group Point Total:	17	



ES-401		Callaway 2002 RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1 / Group 3							Form ES-401-4	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#	
000028 Pressurizer Level Malfunction / 2				X			AA1.02 Effect Of Pzr Level Channel Failure On RMCS	3.4	B033	
000036 Fuel Handling Accident / 8			X				AK3.03 Actions On Decreasing Refuel Pool Level	3.7	R002	
000065 Loss Of Instrument Air / 8					X		AA2.08 Failure Mode Of EFHV43/44	2.9	B034	
K/A Category Point Totals:	0	0	1	1	1	0	Group Point Total:		3	

ES-401		Callaway 2002 RO Examination Outline Plant Systems - Tier 2 / Group 1											Form ES-401-4			
E/APE # / Name / Safety Function		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)		Imp.	Q#
001	Control Rod Drive				X								K4.23	Rod Motion Inhibit	3.4	R003
						X							K5.04	Rod Insertion Limit / P/A Converter Malfunction	4.3	B035
003	Reactor Coolant Pump			X									K3.04	Rx Trip Due To Loss Of RCP	3.9	R004
								X					A1.07	Securing RCP At Power	3.4	B036
004	Chemical and Volume Control					X							K5.20	Reactivity Effect Of Boration	3.6	R005
							X						K6.13	Boration Control Malfunction	3.1	B037
013	Engineered Safety Features Actuation								X				A2.01	ESFAS Response To LOCA	4.6	B038
										X			A3.02	ESFAS Status Panel Indication	4.1	R006
015	Nuclear Instrumentation				X								K4.07	Source Range Permissive	3.7	R007
									X				A2.02	SR Discriminator Failure	3.1	R008
017	In-core Temperature Monitor				X								K4.01	CET Input To Subcooling Monitor	3.4	B039
							X						K6.01	Thermocouple Failures	2.7	R009
022	Containment Cooling		X										K2.01	Containment Coolers Power Supply	3.0	B040
											X		A4.01	CTMT Cooler Operation On SI	3.6	B041
056	Condensate	X											K1.03	MFW Temperature Response To LP Htr Isolation	2.6	B042
									X				A2.04	Trip Of All Condensate Pumps	2.6	R010
059	Main Feedwater	X											K1.04	S/G Water Level Control	3.4	B043
								X					A1.07	MFP Speed Change Due To AEPT508 Failure	2.5	B044

ES-401		Callaway 2002 RO Examination Outline Plant Systems - Tier 2 / Group 1											Form ES-401-4			
E/APE # / Name / Safety Function		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)		Imp.	Q#
061	Auxiliary/Emergency Feedwater					X							K5.01	Relationship Between AFW Flow And RCS Heat Transfer	3.6	B045
										X			A3.01	AMSAC Actuation Of AFW	4.2	R011
068	Liquid Radwaste						X						K6.10	LRW Discharge With Inoperable Monitor	2.5	B046
071	Waste Gas Disposal				X								K4.04	Automatic Action On High Radiation	2.9	B047
072	Area Radiation Monitoring											X	2.2.22	Fuel Handling ARM Required By FSAR	3.4	B048
K/A Category Totals:		2	1	1	4	3	3	2	3	2	1	1	Group Point Total:			23

ES-401	Callaway 2002 RO Examination Outline Plant Systems - Tier 2 / Group 2											Form ES-401-4		
E/APE # / Name / Safety Function	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Q#
002 Reactor Coolant									X			A3.03 Master Pzr Press Controller Setting	4.4	B049
006 Emergency Core Cooling										X		A4.02 ECCS Valve Interlocks	4.0	B050
010 Pressurizer Pressure Control							X					A1.08 Spray Nozzle ΔT Limits	3.2	B051
011 Pressurizer Level Control								X				A2.10 Pzr Level Channel Fails High	3.4	R012
012 Reactor Protection										X		A4.06 Operation Of Rx Trip Breakers	4.3	R013
014 Rod Position Indication					X							K5.01 DRPI Data Failure	2.7	R014
016 Non-nuclear Instrumentation			X									K3.03 Steam Dump Response To ABPT507 Failure	3.0	B052
026 Containment Spray									X			A3.01 CTMT Spray Pump Response To LOCA	4.3	B053
029 Containment Purge				X								K4.02 Maintain Negative Pressure In CTMT	2.9	R015
033 Spent Fuel Pool Cooling				X								K4.05 SFP Dilution - Shutdown Margin	3.1	B054
035 Steam Generator						X						K6.01 Inadvertent Main Steam Line Isolation	3.2	B055
039 Main and Reheat Steam			X									K3.04 MFW Pump Discharge Pressure During Transient	2.5	B056
055 Condenser Air Removal			X									K3.01 Vacuum Pump Auto Starts	2.5	R016
062 AC Electrical Distribution		X										K2.01 Loss Of Startup Transformer	3.3	B057
063 DC Electrical Distribution			X									K3.02 Loss Of DC Control Power	3.5	R017
064 Emergency Diesel Generator									X			A3.07 Load Sequencing During SI	3.6	B058

ES-401		Callaway 2002 RO Examination Outline Plant Systems - Tier 2 / Group 2											Form ES-401-4			
E/APE # / Name / Safety Function		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)		Imp.	Q#
073	Process Radiation Monitoring	X											K1.01	Response To CCW Rad Mon Alarm	3.6	B059
075	Circulating Water				X								K4.01	Cooling Tower Bypass Valve Operation	2.5	R018
079	Station Air										X		A4.01	Loss Of Instrument Air Pressure	2.7	B060
086	Fire Protection											X	2.4.27	Actions Upon Discovery Of Fire	3.0	B061
K/A Category Totals:		1	1	4	3	1	1	1	1	3	3	1	Group Point Total:			20

ES-401	Callaway 2002 RO Examination Outline Plant Systems - Tier 2 / Group 3											Form ES-401-4		
E/APE # / Name / Safety Function	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Q#
005 Residual Heat Removal							X					A1.03 Isolating CCW To RHR Hx	2.5	R019
007 Pressurizer Relief/Quench Tank								X				A2.05 Impact Of Pressure ↑ On PRT	3.2	R020
008 Component Cooling Water			X									K3.02 Control Rod Response To CCW Dilution	2.9	B062
034 Fuel Handling Equipment											X	2.2.30 RO Responsibility During Core Reload	3.5	R021
045 Main Turbine Generator										X		A4.01 Main Turbine Chest Warming	3.1	R022
076 Service Water		X										K2.08 ESW Valve Power Supplies (IPE/PRA)	3.1	R023
078 Instrument Air			X									K3.02 RHR System Air Operated Valves	3.4	B063
103 Containment									X			A3.01 Rad Monitor Response To CISA	3.9	R024
K/A Category Point Totals:	0	1	2	0	0	0	1	1	1	1	1	Group Point Total:		8
Plant-Specific Priorities														
System / Topic	Recommended Replacement for										Reason	Points		
Plant-Specific Priority Total: (limit 10)														

ES-401

Callaway 2002 RO Examination Outline  
Generic Knowledge and Abilities Outline (Tier 3)

Form ES-401-5

Facility: Callaway		Date of Exam: August 2002		Exam RO Level:
Category	K/A #	Topic	Imp.	Q#
Conduct of Operations	2.1.1	License Candidate Requirements In Main CR	3.7	B064
	2.1.11	Minimum Temp For Criticality T/S	3.0	B065
	2.1.18	RO Log Entries	2.9	B066
	2.1.32	Precautions And Limitations For Radwaste Supply	3.4	B067
	2.1.			
	2.1.			
	Total			4
Equipment Control	2.2.11	Continuous Use Procedure Adherence	2.5	B068
	2.2.13	Operation Of Equipment Under Local Control Tag	3.6	B069
	2.2.22	LCO For Refueling Water Storage Tank	3.4	B070
	2.2.33	Rod Bank Overlap	2.5	B071
	2.2.			
	2.2.			
	Total			4
Radiation Control	2.3.1	Radiological Posting	2.6	B072
	2.3.11	Release Termination On Ruptured And Faulted S/G	2.7	B073
	2.3.			
	2.3.			
	2.3.			
	Total			2
Emergency Procedures/ Plan	2.4.1	Reactor Trip Requirements 25%	4.3	R025
	2.4.20	AFW Flow / S/G Level Requirements With Adverse Containment	3.3	B074
	2.4.23	Prioritization Of Emergency Operating Procedures	2.8	B075
	2.4.			
	2.4.			
	Total			3
Tier 3 Point Total RO				13

Facility: <u>Callaway</u>		Date of Examination: <u>August 2002</u>	
Examination Level: <u>RO</u>		Operating Test Number: _____	
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions	
A.1	Conduct Of Operations / Evaluate Plant Performance	Determine If Rod Insertion Limit Has Been Exceeded G 2.1.7 (3.7) A1 RO/SRO	
	Conduct Of Operations / Interpret Reference Material	Determine Dilution Requirements G 2.1.25 (2.8) A2 RO/SRO	
A.2	Equipment Control / Refueling Process	Calculate RHR Pump Run Time For Flood Up G 2.2.27 (2.6) A3 RO	
A.3	Radiation Control / Stay Times	Calculate Stay Time G 2.3.10 (2.9) A4 RO	
A.4	Emergency Procedures / Plan Knowledge Of RERP	Knowledge Of Emergency Plan Duties G 2.4.29 (2.6) A5.1 RO	
		Knowledge Of Emergency Communications G 2.4.43 (2.8) A5.2 RO	

FACILITY REPRESENTATIVE: \_\_\_\_\_ DATE: \_\_\_\_\_

CHIEF EXAMINER: \_\_\_\_\_ DATE: \_\_\_\_\_



Facility: <u>Callaway</u>		Date of Examination: <u>August 2002</u>	
Examination Level: <u>SRO</u>		Operating Test Number: _____	
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions	
A.1	Conduct Of Operations / Evaluate Plant Performance	Determine If Rod Insertion Limit Has Been Exceeded G 2.1.7 (4.4) A1 RO/SRO	
	Conduct Of Operations / Interpret Reference Material	Determine Dilution Requirements G 2.1.25 (3.1) A2 RO/SRO	
A.2	Equipment Control / Surveillance Procedures	Determine Actions For Valve Stroke Test G 2.2.12 (3.4) A3 SRO	
A.3	Radiation Control / Exposure Limits	Reportability For Exceeding Exposure Limits G 2.3.4 (3.1) A4 SRO	
A.4	Emergency Procedures / Plan RERP Notifications	Emergency Event Classification G 2.4.41 (4.1) A5 SRO	

FACILITY REPRESENTATIVE: \_\_\_\_\_ DATE: \_\_\_\_\_

CHIEF EXAMINER: \_\_\_\_\_ DATE: \_\_\_\_\_

Callaway Plant Initial License Exam – August 2002	
	SCENARIO # ILE2002DS1
EXAMINERS: _____ _____ _____ _____	APPLICANTS:    
INITIAL CONDITIONS:	100% Reactor Power, 'B' RHR Pump OOS
TURNOVER:	See Turnover Sheet

Event No.	Event Type *	Event Description	KA Number
A t = 0	N (RO, SRO)	Increase Letdown Flow From 75 GPM to 120 GPM	004A4.06 (3.6 / 3.1)
B t = 10	I (BOP, SRO)	'B' S/G Level Channel 529 Fails High	016K3.12 (3.4 / 3.6)
C t = 20	I (RO, SRO)	VCT Level Channel 149 Fails High	004A2.18 (3.1 / 3.1)
D t = 25	C (ALL)	'B' Circulating Water Pump Trip	075A2.02 (2.5 / 2.7)
E t = 25	R (RO)	Turbine Setback to 75% Power	045K4.12 (3.3 / 3.6)
F t = 35	M (ALL)	Hotwell Instrumentation Leak - Loss of Feed	054AA2.01 (4.3 / 4.4)
G PRE	C (BOP, SRO)	Turbine Automatic Trip Failure	007EA1.07 (4.3 / 4.3)
H PRE	M (ALL)	Large Break LOCA	011EK3.12 (4.4 / 4.6)
I PRE	C (ALL)	ESF Bus NB01 Lockout (IPE / PRA)	062A2.04 (3.1 / 3.4)

\* (N) Normal (R) Reactivity (I) Instrument (C) Component (M) Major

FACILITY REPRESENTATIVE: \_\_\_\_\_ DATE: \_\_\_\_\_

CHIEF EXAMINER: \_\_\_\_\_ DATE: \_\_\_\_\_



Callaway Plant Initial License Exam – August 2002	
	SCENARIO # ILE2002DS2
EXAMINERS: _____ _____ _____ _____	APPLICANTS:    
INITIAL CONDITIONS:	30% Reactor Power, 'B' RHR Pump OOS
TURNOVER:	See Turnover Sheet

Event No.	Event Type *	Event Description	KA Number
A t = 0	N (RO, SRO)	Swap Charging From NCP To CCP	004A4.08 (3.8 / 3.4)
B t = 10	I (RO, SRO)	Pressurizer Pressure Channel 455 Fails High	027AA2.15 (3.7 / 4.0)
C t = 20	I (BOP, SRO)	Steam Flow Channel 542 Fails High On 'D' S/G	059A2.11 (3.0 / 3.3)
D t = 25	C (ALL)	Steam Generator Tube Leak On 'D' S/G	037AK3.05 (3.7 / 4.0)
E t = 25	R (RO)	Plant Shutdown Due To S/G Tube Leak	004A4.01 (3.8 / 3.9)
F t = 40	M (ALL)	Steam Generator Tube Rupture On 'D' S/G (IPE / PRA)	038EA2.02 (4.5 / 4.8)
G PRE	C (ALL)	Failure Of 'D' FWIV To Automatically Close	013A4.01 (4.5 / 4.8)
H t = 42	M (ALL)	S/G Safety Stuck Open On 'D' S/G	035A2.01 (4.5 / 4.6)

\* (N) Normal (R) Reactivity (I) Instrument (C) Component (M) Major

FACILITY REPRESENTATIVE: \_\_\_\_\_ DATE: \_\_\_\_\_

CHIEF EXAMINER: \_\_\_\_\_ DATE: \_\_\_\_\_

Callaway Plant Initial License Exam – August 2002	
	SCENARIO # ILE2002DS B/U
EXAMINERS: _____ _____ _____	APPLICANTS:   
INITIAL CONDITIONS:	80% Reactor Power, 'B' RHR Pump OOS
TURNOVER:	See Turnover Sheet

Event No.	Event Type *	Event Description	KA Number
A t = 0	I (RO, SRO)	Pressurizer Level Channel 459 Fails Low	011A2.11 (3.4 / 3.6)
B t = 0	C (RO, SRO)	Letdown Isolation Valve Fails Closed	004A2.07 (3.4 / 3.7)
C N/A	N (RO, SRO)	Place Excess Letdown In Service	028AA1.05 (2.8 / 2.9)
D t = 20	C (ALL)	'A' RCP High Vibration	015AA1.23 (3.1 / 3.2)
E t = 20	R (RO)	Plant Shutdown Due To RCP High Vibration	004A4.01 (3.8 / 3.9)
F t = 35	I (BOP, SRO)	'A' S/G PORV Failure	041A4.06 (2.9 / 3.1)
G t = 40	M (ALL)	Loss of Off-Site Power and NB02	056AA2.44 (4.3 / 4.5)
H PRE	C (ALL)	Auto Reactor Trip Failure	029EA1.12 (4.1 / 4.0)
I PRE	C (ALL)	TDAFP Fails To Auto Start	061A2.04 (3.4 / 3.8)
J PRE	C (ALL)	Loss of All AC due to NE01 Failure (IPE / PRA)	055EA2.02 (4.4 / 4.6)

\* (N) Normal (R) Reactivity (I) Instrument (C) Component (M) Major

FACILITY REPRESENTATIVE: \_\_\_\_\_ DATE: \_\_\_\_\_

CHIEF EXAMINER: \_\_\_\_\_ DATE: \_\_\_\_\_



Callaway Plant Initial License Exam – August 2002	
	SCENARIO # ILE2002DS2
EXAMINERS: _____ _____ _____ _____	APPLICANTS:    
INITIAL CONDITIONS:	30% Reactor Power, 'B' RHR Pump OOS
TURNOVER:	See Turnover Sheet

Event No.	Event Type *	Event Description	KA Number
A t = 0	N (RO, SRO)	Swap Charging From NCP To CCP	004A4.08 (3.8 / 3.4)
B t = 10	I (RO, SRO)	Pressurizer Pressure Channel 455 Fails High	027AA2.15 (3.7 / 4.0)
C t = 20	I (BOP, SRO)	Steam Flow Channel 542 Fails High On 'D' S/G	059A2.11 (3.0 / 3.3)
D t = 25	C (ALL)	Steam Generator Tube Leak On 'D' S/G	037AK3.05 (3.7 / 4.0)
E t = 25	R (RO)	Plant Shutdown Due To S/G Tube Leak	004A4.01 (3.8 / 3.9)
F t = 40	M (ALL)	Steam Generator Tube Rupture On 'D' S/G (IPE / PRA)	038EA2.02 (4.5 / 4.8)
G PRE	C (ALL)	Failure Of 'D' FWIV To Automatically Close	013A4.01 (4.5 / 4.8)
H t = 42	M (ALL)	S/G Safety Stuck Open On 'D' S/G	035A2.01 (4.5 / 4.6)

\* (N) Normal (R) Reactivity (I) Instrument (C) Component (M) Major

FACILITY REPRESENTATIVE: \_\_\_\_\_ DATE: \_\_\_\_\_

CHIEF EXAMINER: \_\_\_\_\_ DATE: \_\_\_\_\_

Callaway Plant Initial License Exam – August 2002	
	SCENARIO # ILE2002DS B/U
EXAMINERS: _____ _____ _____	APPLICANTS:   
INITIAL CONDITIONS:	80% Reactor Power, 'B' RHR Pump OOS
TURNOVER:	See Turnover Sheet

Event No.	Event Type *	Event Description	KA Number
A t = 0	I (RO, SRO)	Pressurizer Level Channel 459 Fails Low	011A2.11 (3.4 / 3.6)
B t = 0	C (RO, SRO)	Letdown Isolation Valve Fails Closed	004A2.07 (3.4 / 3.7)
C N/A	N (RO, SRO)	Place Excess Letdown In Service	028AA1.05 (2.8 / 2.9)
D t = 20	C (ALL)	'A' RCP High Vibration	015AA1.23 (3.1 / 3.2)
E t = 20	R (RO)	Plant Shutdown Due To RCP High Vibration	004A4.01 (3.8 / 3.9)
F t = 35	I (BOP, SRO)	'A' S/G PORV Failure	041A4.06 (2.9 / 3.1)
G t = 40	M (ALL)	Loss of Off-Site Power and NB02	056AA2.44 (4.3 / 4.5)
H PRE	C (ALL)	Auto Reactor Trip Failure	029EA1.12 (4.1 / 4.0)
I PRE	C (ALL)	TDAFP Fails To Auto Start	061A2.04 (3.4 / 3.8)
J PRE	C (ALL)	Loss of All AC due to NE01 Failure (IPE / PRA)	055EA2.02 (4.4 / 4.6)

\* (N) Normal (R) Reactivity (I) Instrument (C) Component (M) Major

FACILITY REPRESENTATIVE: \_\_\_\_\_ DATE: \_\_\_\_\_

CHIEF EXAMINER: \_\_\_\_\_ DATE: \_\_\_\_\_





Facility:	<u>Callaway</u>	Date of Examination:	<u>August 2002</u>
Exam Level:	<u>RO</u>	Operating Test No.:	_____
<b>B.1 Control Room Systems</b>			
System / JPM Title		Type Code *	Safety Function
a.	Recover a Dropped Control Rod 001A4.06 (2.9 / 3.2) S1	D, S	1
b.	Manually Operate MSIVs Which Fail to Actuate 013A4.01 (4.5 / 4.8) C1	M, A, C, L	2
c.	Depressurize and Block Safety Injection 010A4.01 (3.7 / 3.5) S4	D, S, L	3
d.	Perform 'B' RHR Pump Non-Surveillance Run 005A4.01 (3.6 / 3.4) S2	N, S	4 (Pri)
e.	Main Turbine Mechanical O/S Trip Test 045A2.17 (2.7 / 2.9) S3	D, S, A	4 (Sec)
f.	Respond to a Failed Power Range Instrument 015A2.02 (3.1 / 3.5) S5	D, S, L	7
g.	Restoration of CCW From Inadvertent CIS B 008A4.01 (3.3 / 3.1) S6	N, S, L	8
B/U	Start 'A' CTMT Cooler Fan 022A4.01 (3.6 / 3.6) Backup	D, S, A	5
<b>B.2 Facility Walk-Through</b>			
a.	Emergency Boration Per FR-S.1 004A2.14 (3.8 / 3.9) P1	D, A, R, P	1
b.	Locally Close Valves for CIS A 103A2.03 (3.5 / 3.8) P2	D, R, P	5
c.	Locally Start NE01 Emergency DG (IPE / PRA) 064A4.01 (4.0 / 4.3) P3	D, A, P	6
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA, (P)lant			

FACILITY REPRESENTATIVE: \_\_\_\_\_ DATE: \_\_\_\_\_

CHIEF EXAMINER: \_\_\_\_\_ DATE: \_\_\_\_\_

Facility:	<u>Callaway</u>	Date of Examination:	<u>August 2002</u>
Exam Level:	<u>SRO (I)</u>	Operating Test No.:	_____
<b>B.1 Control Room Systems</b>			
System / JPM Title		Type Code *	Safety Function
a.	Recover a Dropped Control Rod 001A4.06 (2.9 / 3.2) S1	D, S	1
b.	Manually Operate MSIVs Which Fail to Actuate 013A4.01 (4.5 / 4.8) C1	M, A, C, L	2
c.	Depressurize and Block Safety Injection 010A4.01 (3.7 / 3.5) S4	D, S, L	3
d.	Perform 'B' RHR Pump Non-Surveillance Run 005A4.01 (3.6 / 3.4) S2	N, S	4 (Pri)
e.	Main Turbine Mechanical O/S Trip Test 045A2.17 (2.7 / 2.9) S3	D, S, A	4 (Sec)
f.	Respond to a Failed Power Range Instrument 015A2.02 (3.1 / 3.5) S5	D, S, L	7
g.	Restoration of CCW From Inadvertent CIS B 008A4.01 (3.3 / 3.1) S6	N, S, L	8
B/U	Start 'A' CTMT Cooler Fan 022A4.01 (3.6 / 3.6) Backup	D, S, A	5
<b>B.2 Facility Walk-Through</b>			
a.	Emergency Boration Per FR-S.1 004A2.14 (3.8 / 3.9) P1	D, A, R, P	1
b.	Locally Close Valves for CIS A 103A2.03 (3.5 / 3.8) P2	D, R, P	5
c.	Locally Start NE01 Emergency DG (IPE / PRA) 064A4.01 (4.0 / 4.3) P3	D, A, P	6
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA, (P)lant			

FACILITY REPRESENTATIVE: \_\_\_\_\_ DATE: \_\_\_\_\_

CHIEF EXAMINER: \_\_\_\_\_ DATE: \_\_\_\_\_

Facility:	<u>Callaway</u>	Date of Examination:	<u>August 2002</u>
Exam Level:	<u>SRO (U)</u>	Operating Test No.:	_____
<b>B.1 Control Room Systems</b>			
System / JPM Title		Type Code *	Safety Function
a.	Manually Operate MSIVs Which Fail to Actuate 013A4.01 (4.5 / 4.8) C1	M, A, C, L	2
b.	Perform 'B' RHR Pump Non-Surveillance Run 005A4.01 (3.6 / 3.4) S2	N, S	4 (Pri)
c.	Restoration of CCW From Inadvertent CIS B 008A4.01 (3.3 / 3.1) S6	N, S, L	8
d.			
e.			
f.			
g.			
	B/U Start 'A' CTMT Cooler Fan 022A4.01 (3.6 / 3.6) Backup	D, S, A	5
<b>B.2 Facility Walk-Through</b>			
a.	Emergency Boration Per FR-S.1 004A2.14 (3.8 / 3.9) P1	D, A, R, P	1
b.	Locally Start NE01 Emergency DG (IPE / PRA) 064A4.01 (4.0 / 4.3) P3	D, A, P	6
c.			
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA, (P)lant			

FACILITY REPRESENTATIVE: \_\_\_\_\_ DATE: \_\_\_\_\_

CHIEF EXAMINER: \_\_\_\_\_ DATE: \_\_\_\_\_