Final Exam Outline 10-4-01

Facility: South Texas Project Date of Exam: 09/14/2001 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	A2	A3	A4	G *	
1. Emergency & Abnormal Plant Evolutions	1	2	2	5				4	8			3	24
	2	2	2	3				3	4			2	16
	3	1	1	0				0	1			0	3
	Tier Totals	5	5	8				7	13			5	43
2. Plant Systems	1	1	2	1	2	2	1	2	4	1	2	1	19
	2	2	0	2	1	2	1	2	4	1	1	1	17
	3	1	0	1	0	1	0	0	0	0	0	1	4
	Tier Totals	4	2	4	3	5	2	4	8	2	3	3	40

3. Generic Knowledge and Abilities	Cat 1	Cat 2	Cat 3	Cat 4	17
	4	5	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 ±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	PWR 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.	Points
000001 Continuous Rod Withdrawal / 1				05			Reactor trip switches	4.3/4.2	1
000003 Dropped Control Rod / 1					03		Dropped rod, using in-core/ex-core instrumentation, in-core or loop temperature measurements	3.6/3.8	1
000005 Inoperable/Stuck Control Rod / 1	03						Xenon transient	3.2/3.6	1
000011 Large Break LOCA / 3					11		Conditions for throttling or stopping HPI	3.9/4.3	1
W/E02 SI Termination / 3					01		Facility conditions and selection of appropriate procedures during abnormal and emergency operations	3.3/4.2	1
000015/17 RCP Malfunctions / 4						2.1.28	K/O of the purpose and function of major system comp and controls	3.2/3.3	1
W/E09 Natural Circ. / 4	01						Components, capacity, and function of emergency systems	3.0/3.4	1
000024 Emergency Boration / 1				13			Boric acid flow controller	3.2/3.0	1
000026 Loss of Component Cooling Water / 8			04				Effect on the CCW flow header of a loss of CCW	3.5/3.7	1
000029 Anticipated Transient w/o Scram / 1					*01*		*Positive displacement charging pumps*	*3.1/3.4*	*1*
000040 Steam Line Rupture - Excessive Heat Transfer / 4						2.4.21	Knowledge of the parameters and logic used to assess the status of safety functions including: Reactor Coolant System Integrity	3.7/4.3	1
W/E08 RCS Overcooling - PTS / 4		02					Knowledge of the interrelations between PTS and the facility's heat removal systems	3.6/4.0	1
000051 Loss of Condenser Vacuum / 4					02		Conditions requiring reactor and/or turbine trip	3.9/4.1	1
000055 Station Blackout / 6				06			Restoration of power with one EDG	4.1/4.5	1
000055 Station Blackout / 6					*06*		*Faults and lockouts that must be cleared prior to re-energize buses*	*3.7/4.1*	*1*
000057 Loss of Vital AC Elec. Inst. Bus / 6					14		That substitute power sources have come on line on a loss of initial AC	3.2/3.6	1
000059 Accidental Liquid RadWaste Rel. / 9					04		Valve lineup for a release of radioactive liquid	3.2/3.5	1
000062 Loss of Nuclear Service Water / 4				04			CRDM high-temperature alarm system	2.7/2.8	1
000062 Loss of Nuclear Service Water / 4			*02*		*~~02~~*		*~~The cause of possible SWS loss~~ Auto Alignment resulting from act. Of ESFAS (unable to find or develop SRO level question for prev. KA)*	*~~2.9/3.6~~ 3.6/3.9*	*1*
000067 Plant Fire On-site / 9						2.4.25	Knowledge of fire protection procedures	2.9/3.4	1
000068 Control Room Evac. / 8			07				Maintenance of S/G level using AFW flow control valves	4.0/4.3	1
000068 Control Room Evac. / 8			*18*		*~~02~~*		*~~Local boric acid flow~~ Actions contained in EOP for control rm evac (unable to develop SRO level question with prev KA)*	*4.2/4.5*	*1*
000074 Inad. Core Cooling / 4		04					HPI pumps	3.9/4.1	1
000076 High Reactor Coolant Activity / 9			06				Actions contained in EOP for high reactor coolant activity	3.2/3.8	1
K/A Category Totals:	2	2	~~3~~ 5	4	~~10~~ 8	3	Group Point Total:		24

ES-401	PWR 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.	Points
000007 Reactor Trip - Stabilization - Recovery / 1				~~10~~ 03			~~Steam generator pressure~~ RCS pressure an temperature (unable to write a question with any discrimination)	~~3.7/3.7~~ 4.1/4.1	1
000008 Pressurizer Vapor Space Accident / 3				08			PRT level pressure and temperature	3.8/3.8	1
000009 Small Break LOCA / 3					*~~10~~ 34*		*~~Airborne activity~~ Determine conditions for throttling/stopping HPI Unable to find or develop and SRO only question for Airborne*	*~~3.1/3.7~~ 3.6/4/2*	*1*
W/E03 LOCA Cooldown - Depress. / 4					*02*		*Adherence to appropriate procedures and operations within the facility's license and amendments*	*3.5/4.1*	*1*
W/E11 Loss of Emergency Coolant Recirc. / 4	02						Normal, abnormal and emergency operating procedures associated with Loss of emergency coolant operation	3.6/4.1	1
000022 Loss of Reactor Coolant Makeup / 2			06				RCP thermal barrier cooling	3.2/3.3	1
000025 Loss of RHR System / 4			03				Immediate actions contained in EOP for loss of RHRS	3.9/4.1	1
000027 Pressurizer Pressure Control System Malfunction / 3					~~17~~ 11		~~Allowable RCS temperature difference vs. reactor power~~ RCS Pressure	~~3.1/3.3~~ 4.0/4.1	1
000037 Steam Generator Tube Leak / 3						2.4.46	Ability to verify that the alarms are consistent with plant conditions	3.5/3.6	1
000038 Steam Generator Tube Rupture / 3				~~26~~ 36			~~High head safety injection mini-flow valves and position indicators~~ (unable to develop a quality question with the previous KA) Cooldown of RCS to a specified temp	~~3.6/3.4~~ 4.3/4.5	1
000054 Loss of Main Feedwater / 4			05				HPI/PORV cycling upon total feedwater loss	4.6/4.7	1
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4		*02*					*Facility's heat removal systems and relations between the proper operation of these systems to the operation of the facility*	*3.9/4.2*	*1*
000058 Loss of DC Power / 6	01						Battery charger equipment and instrumentation	2.8/3.1	1
000060 Accidental Gaseous Radwaste Rel. / 9		02					Auxiliary building ventilation	2.7/3.1	1
000061 ARM System Alarms / 7						2.431	Knowledge annunciators alarms and indications, and use the response intr.		
W/E16 High Containment Radiation / 9		*~~01~~*			*1*		*~~Components and functions of control rod and safety systems, including instrumentation, signals, interlocks, failure modes and auto/man features~~ Selection of appropriate proc during abn/emerg ops*	*~~3.0/3.3~~ 2.9/3.3*	*1*
K/A Category Point Totals:	2	2	3	3	4	2	Group Point Total:		16

ES-401	PWR 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.	Points
000028 Pressurizer Level Malfunction / 2	01						PZR reference leak abnormality	2.8/3.1	1
000036 Fuel Handling Accident / 8		02					Radiation monitoring equipment (portable or installed)	3.4/3.9	1
W/E15 Containment Flooding / 5					01		Adherence to appropriate procedures and operations within the limitations in the facility's license and amendments	2.9/3.3	1
K/A Category Point Totals:	1	1	0	0	1	0	Group Point Total:		3

ES-401	PWR SRO Examination Outline Plant Systems - Tier 2/Group 1											Form ES-401-3	
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive									03			Axial imbalance	3.6/3.8	1
003 Reactor Coolant Pump			02									Steam generator	3.5/3.8	1
004 Chemical and Volume Control								*13*				*Low RWST*	*3.6/3.9*	*1*
004 Chemical and Volume Control						37						Boron loading of demineralizer system	2.9/3.4	1
013 Engineered Safety Features Actuation					02							Safety system logic and reliability	2.9/3.3	1
014 Rod Position Indication								*03*				*Dropped rod*	*3.6/4.1*	*1*
014 Rod Position Indication										01		Rod selection control	3.3/3.1	1
015 Nuclear Instrumentation								05				Core void formation	3.3/3.8	1
017 In-core Temperature Monitor										01		Actual in core temperatures	3.8/4.1	1
022 Containment Cooling					04							Cooling of control rod drive motors	2.8/3.1	1
026 Containment Spray		02										MOVs	2.7/2.9	1
056 Condensate											2.1.27	Knowledge of system purpose and function	2.8/2.9	1
059 Main Feedwater								*05*				*Rupture in MFW suction or discharge line*	*3.1/3.4*	*1*
059 Main Feedwater	05											RCS	3.1/3.2	1
061 Auxiliary/Emergency Feedwater							*04*	~~*05*~~				~~*Automatic control malfunction*~~ *AFW tank level*	~~*3.1/3.4*~~ *3.9/3.9*	*1*
061 Auxiliary/Emergency Feedwater		03										AFW diesel driven pump	4.0/3.8	1
063 DC Electrical Distribution				02								Breaker interlocks, permissives, bypasses and crossties	2.9/3.2	1

068 Liquid Radwaste				01								Safety and environmental precautions for handling hot, acidic and radioactive liquids	3.4/4.1	1
072 Area Radiation Monitoring							03					Blown power supply fuses	2.7/2.9	1
K/A Category Point Totals:	1	2	1	2	2	1	~~1~~ 2	~~5~~ 4	1	2	1	Group Point Total:		19

ES-401	PWR SRO Examination Outline Plant Systems - Tier 2/Group 2	Form ES-401-3

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant				05								Detection of RCS leakage	3.8/4.2	1
006 Emergency Core Cooling										11		Overpressure protection system	4.2/4.3	1
010 Pressurizer Pressure Control					02							Constant enthalpy expansion through a valve	2.6/3.0	1
011 Pressurizer Level Control								*03*				*Loss of PZR level*	*3.8/3.9*	*1*
012 Reactor Protection								*01*				*Faulty bistable operation*	*3.1/3.6*	*1*
016 Non-nuclear Instrumentation									02			Relationship between meter readings and actual parameter values	2.9/2.9	1
033 Spent Fuel Pool Cooling			02									Area and ventilation monitoring system	2.8/3.2	1
034 Fuel Handling Equipment								03				Mispositioned fuel element	3.3/4.0	1
035 Steam Generator	12											RPS	3.7/3.9	1
035 Steam Generator						01						MSIVs	3.2/3.6	1
039 Main and Reheat Steam					08							Effect of steam removal on reactivity	3.6/3.6	1
062 AC Electrical Distribution							01					Significance of D/G load limits	3.4/3.8	1
064 Emergency Diesel Generator			01									Systems controlled by automatic loader	3.8/4.1	1
073 Process Radiation Monitoring								02				Detector failure	2.7/3.2	1
075 Circulating Water	08											Emergency/ Essential SWS	3.2/3.2	1
086 Fire Protection											2.4.25	Knowledge of fire protection procedures	2.9/3.4	1
103 Containment							01					Containment pressure, temperature, and humidity	3.7/4.1	1
K/A Category Point Totals:	2	0	2	1	2	1	2	4	1	1	1	Group Point Total:		17

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PWR SRO Examination Outline
Plant Systems - Tier 2/Group 3

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)
005 Residual Heat Removal			03									RCS pressure boundary MOVs
~~*007 Pressurizer Relief/Quench Tank*~~								~~*05*~~				~~*Exceeding PRT high pressure lim develop an SRO only question*~~
008 Component Cooling Water	01											SWS
045 Main Turbine Generator					18							Purpose of low-power reactor trips 25% power)
076 Service Water											2.1.12	Ability to Apply T/S to the system
K/A Category Point Totals:	1	0	1	0	1	0	0	0	0	0	1	Group Point Total:

Plant-Specific Priorities

System / Topic	Recommended Replacement for...	Reason

Plant-Specific Priority Total: (limit 10)

Final Exam Outline 10-04-01

Facility: South Texas Project Date of Exam: 09-14-2001 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	2	2	3				3	3			3	16
	2	2	2	3				4	4			2	17
	3	1	1	0				0	1			0	3
	Tier Totals	5	5	6				7	8			5	36
2. Plant Systems	1	2	2	3	4	2	1	3	1	2	2	1	23
	2	2	2	2	3	2	2	1	2	1	2	1	20
	3	1	1	1	1	1	0	2	0	0	0	1	8
	Tier Totals	5	5	6	8	5	3	6	3	3	4	3	51

3. Generic Knowledge and Abilities	Cat 1	Cat 2	Cat 3	Cat 4	13
	4	3	2	4	

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 ±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	PWR 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.	Points
000005 Inoperable/Stuck Control Rod / 1 #49	03						Xenon Transient	3.2/3.6	1
000015/17 RCP Malfunctions / 4 #50						2.1.28	Knowledge of the purpose and function of major system components and controls	3.2/3.3	1
W/E09 Natural Circ. / 4 #01	01						Components, capacity, and function of emergency systems	3.0/3.4	1
000024 Emergency Boration / 1 #02				13			Boric acid flow controller	3.2/3.0	1
000026 Loss of Component Cooling Water / 8 #51			04				Effect on the CCW flow header of a loss of CCW	3.5/3.7	1
000027 Pressurizer Pressure Control System Malfunction / 3 #52					~~17~~ 11		~~Allowable RCS temperature difference vs. reactor power~~ RCS pressure	~~3.1/3.3~~ 4.0/4.1	1
000040 W/E12 Steam Line Rupture - Excessive Heat Transfer / 4 #53						2.4.21	Knowledge of the parameters and logic used to assess the status of safety functions including: Reactor Coolant System Integrity	3.7/4.3	1
W/E08 RCS Overcooling - PTS / 4 #54		02					Knowledge of interrelations between PTS and facility's heat removal systems	3.6/4.0	1
000051 Loss of Condenser Vacuum / 4 #03					02		Conditions requiring reactor and/or turbine trip	3.9/4.1	1
000055 Station Blackout / 6 #45				06			Restoration of power with one EDG	4.1/4.5	1
000057 Loss of Vital AC Elec. Inst. Bus / 6 #48					~~14~~ 13		~~That substitute power sources have come on line on a loss of initial AC~~ VCT level and pressure indicators and recorders	~~3.2/3.6~~ 3.0/3.4	1
000062 Loss of Nuclear Service Water / 4 #89				~~04~~ 06			~~CRDM high-temperature alarm system~~ Control of flow rates to components cooled by SWS	~~2.7/2.8~~ 2.9/2.9	1
000067 Plant Fire On-site / 9 #44						2.4.25	Knowledge of fire protection procedures	2.9/3.4	1
000068 (BW/A06) Control Room Evac. / 8 #96			07				Maintenance of S/G level using AFW flow control valves	4.0/4.3	1
000074 (W/E06&E07) Inad. Core Cooling / 4 #55		04					HPI pumps	3.9/4.1	1
000076 High Reactor Coolant Activity / 9 #04			06				Actions contained in EOP for high reactor coolant activity	3.2/3.8	1
K/A Category Totals:	2	2	3	3	3	3	Group Point Total:		16

ES-401	PWR 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.	Points
000001 Continuous Rod Withdrawal / 1 #56				05			Reactor trip switches	4.3/4.2	1
000003 Dropped Control Rod / 1 #05					03		Dropped rod, using in-core/ex-core instrumentation, in-core or loop temperature measurements	3.6/3.8	1
000007 Reactor Trip - Stabilization - Recovery / 1 #57				~~10~~ 03			~~Steam generator pressure~~ RCS pressure and temperature	~~3.7/3.7~~ 4.2/4.1	1
000008 Pressurizer Vapor Space Accident / 3 #06				08			PRT level pressure and temperature	3.8/3.8	1
000011 Large Break LOCA / 3 #47					~~11~~ 13		~~Conditions for throttling or stopping HPI~~ Difference between overcooling and LOCA	~~3.9/4.3~~ 3.7/3.7	1
W/E03 LOCA Cooldown/Depress. / 4 #87		01					Components and functions of control and safety systems (instrumentation, interlocks, signals, failure modes, automatic and manual features)	3.6	1
W/E11 Loss of Emergency Coolant Recirc. / 4 #07	02						Normal, abnormal and emergency operating procedures associated with Loss of emergency coolant operation	3.6/4.1	1
W/E02 SI Termination / 3 #08					01		Facility conditions and selection of appropriate procedures during abnormal and emergency operations	3.3/4.2	1
000022 Loss of Reactor Coolant Makeup / 2 #61			06				RCP thermal barrier cooling	3.2/3.3	1
000025 Loss of RHR System / 4 #62			03				Immediate actions contained in EOP for loss of RHRS	3.9/4.1	1
000037 Steam Generator Tube Leak / 3 #58						2.4.46	Ability to verify that the alarms are consistent with plant conditions	3.5/3.6	1
000038 Steam Generator Tube Rupture / 3 #59				~~26~~ 36			~~High head safety injection mini-flow valves and position indicators~~ Cooldown of RCS to a specified temperature	~~3.6/3.4~~ 4.3/4.5	1
000054 Loss of Main Feedwater / 4 #09			05				HPI/PORV cycling upon total feedwater loss	4.6/4.7	1
000058 Loss of DC Power / 6 #63	01						Battery charger equipment and instrumentation	2.8/3.1	1
000059 Accidental Liquid RadWaste Rel. / 9 #90					04		Valve lineup for a release of radioactive liquid	3.2/3.5	1
000060 Accidental Gaseous Radwaste Rel. / 9 #10		02					Auxiliary building ventilation system	2.7/3.1	1
000061 ARM System Alarms / 7 #11						2.4.31	Knowledge annunciators alarms and indications, and use the response instr.	3.3/3.4	1
K/A Category Point Totals:	2	2	3	4	4	2	Group Point Total:		17

ES-401	PWR 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.	Points
000028 Pressurizer Level Malfunction / 2	#60	01						PZR reference leak abnormality	2.8/3.1	1
000036 Fuel Handling Accident / 8	#73		02					Radiation monitoring equipment (portable and installed)	3.4/3.9	1
W/E15 Containment Flooding / 5	#78					02		Adherence to appropriate procedures and operations within the limitations in the facility's license and amendments	2.9/3.3	1
K/A Category Point Totals:		1	1	0	0	1	0	Group Point Total:		3

ES-401	PWR RO Examination Outline Plant Systems - Tier 2/Group 1	Form ES-401-4

System # / Name		K1	K2	K3	K4	K5	K6	A1	A2	A 3	A4	G	K/A Topic(s)	Imp.	Pts
001 Control Rod Drive	#12				07								Rod stops	3.7	1
	#74									03			Axial imbalance	3.6/3.8	1
	#75										~~01~~ 10		~~Seal injection~~ Determination of an ECP (estimated critical position)	~~3.3~~ 3.5	1
003 Reactor Coolant Pump	#16			02									Steam generator	3.5/3.8	1
	#82						02	~~04~~					~~RCP oil reservoir levels~~ RCP seals and water supply	~~2.6~~ 2.7	1
004 Chemical and Volume Control	#20					20							Reactivity effects of xenon, boration, and dilution	3.6	1
	#41						~~37~~ 13						~~Boron loading of demineralizer system~~ Purpose & function of the boration/dilution batch controller	~~2.9/3.4~~ 3.1/3.3	1
	#19									10			PZR level and pressure	3.9	1
013 Engineered Safety Features Actuation	#76		01										ESFAS/ Safeguards equipment control	3.6	1
	#13					02							Safety system logic and reliability	2.9/3.3	1
015 Nuclear Instrumentation	#21								~~05~~ 01				~~Core void formation~~ Power supply loss or erratic operation	~~3.3/3.8~~ 3.5/3.9	1
017 In-core Temperature Monitor	#79			01									Natural circulation indications	3.5	1
	#80										01		Actual in core temperatures	3.8/4.1	1
022 Containment Cooling	#77			02									Containment instrumentation readings	3.0	1
	#14				04								Cooling of control rod drive motors	2.8/3.1	1

System # / Name		K1	K2	K3	K4	K5	K6	A1	A2	A 3	A4	G	K/A Topic(s)	Imp.	Pts
056 Condensate	#40											2.1.27	Knowledge of system purpose and or function	2.8/2.9	1
059 Main Feedwater	#91	05											RCS	3.1/3.2	1
	#15				~~18~~ 16								~~Automatic feedwater reduction on plant trip~~ Automatic trips for MFW pumps	~~2.8~~ 3.1	1
	#88							07					Feed pump speed, including normal control speed for ICS	2.5	1
061 Auxiliary/Emergency Feedwater	#92	11											AFW turbine exhaust/supply drains	2.7	1
	#72		~~03~~ 02										~~AWF diesel driven pump~~ AFW electric drive pumps	~~4.0/3.8~~ 3.7/3.7	1
068 Liquid Radwaste	#17				01								Safety and environmental precautions for handling hot, acidic and radioactive liquids	3.4/4.1	1
072 Area Radiation Monitoring	#18								~~03~~ 02				~~Blown power supply fuses~~ Detector failure	~~2.7/2.9~~ 2.8/2.9	1
K/A Category Point Totals:		2	2	3	4	2	2	1	2	2	2	1	Group Point Total:		23

ES-401 PWR RO Examination Outline Plant Systems - Tier 2/Group 2 Form ES-401-4

System # / Name		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts
002 Reactor Coolant	#99				05								Detection of RCS leakage	3.8/4.2	1
006 Emergency Core Cooling	#94										11		Overpressure protection system	4.2/4.3	1
010 Pressurizer Pressure Control	#71					02							Constant enthalpy expansion through a valve	2.6/3.0	1
011 Pressurizer Level Control	#22							02					Charging and letdown flows	3.3	1
012 Reactor Protection	#85		01										RPS channels, components, and interconnections	3.3	1
014 Rod Position Indication	#100										01		Rod selection control	3.3/3.1	1
016 Non-nuclear Instrumentation	#86									02			Relationship between meter readings and actual parameter values	2.9/2.9	1
026 Containment Spray	#23		02										MOVs	2.7/2.9	1
029 Containment Purge	#24								03				Startup operations and the associated required valve lineups	2.7	1
033 Spent Fuel Pool Cooling	#97			02									Area and ventilation radiation monitoring system	2.8/3.2	1
035 Steam Generator	#70	12											RPS	3.7/3.9	1

System # / Name		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts
035 Steam Generator	#69						01						MSIVs	3.2/3.6	1
039 Main and Reheat Steam	#83					08							Effect of steam removal on reactivity	3.6/3.6	1
062 AC Electrical Distribution	#25							01					Significance of D/G load limits	3.4/3.8	1
063 DC Electrical Distribution	#65				02								Breaker interlocks, permissives, bypasses and cross-ties	2.9/3.2	1
064 Emergency Diesel Generator	#64			01									Systems controlled by automatic loader	3.8/4.1	1
073 Process Radiation Monitoring	#26								02				Detector failure	2.7/3.2	1
075 Circulating Water	#93	~~08~~ 02											~~Emergency/Essential SWS~~ Liquid waste discharge	~~3.2/3.2~~ 2.9/3.1	1
079 Station Air	#43				01								Cross connect with IAS	2.9	1
086 Fire Protection	#42											2.4. 25	Knowledge of fire protection procedures	2.9/3.4	
K/A Category Point Totals:		2	2	2	3	2	1	2	2	1	2	1	Group Point Total:		20

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System # / Name		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts
005 Residual Heat Removal	#27		03										RCS pressure boundary MOVs	2.7/2.8	1
008 Component Cooling Water	#29	01											SWS	3.1/3.1	1
034 Fuel Handling Equipment	#68								~~03~~			2.2.22	~~Mispositioned fuel element~~ Knowledge of LCO & safety limits	~~3.3/4.0~~ 3.4/4.1	1
041 Steam Dump/Turbine Bypass Control	#67				16								Low main steam pressure	2.6	1
045 Main Turbine Generator	#66					18							Purpose of low-power reactor trips (limited to 25% power)	2.7/3.2	1
076 Service Water	#98							02					Reactor and turbine building closed cooling water temp	2.6	1
078 Instrument Air	#28			02									Systems having pneumatic controls and valves	3.4	1
103 Containment	#95							01					Containment pressure, temperature, and humidity	3.7/4.1	1
K/A Category Point Totals:		1	1	1	1	1	0	2	0	0	0	1	Group Point Total:		8

Facility: South Texas Project Date of Exam: Exam Level: RO

Category	K/A #	Topic	Imp.	Pts
Conduct of Operations	2.1.1	Knowledge of conduct of operations requirements #31	3.7	1
	2.1.7	Evaluate plant performance and make judgements based on Rx, operating char., and instrument interp. #30	3.7/4.4	1
	2.1.11	Knowledge of less than one hour T.S. action stmts #32	3.0/3.8	1
	2.1.28	Knowledge of the purpose and function of major system components and controls #33	3.2	1
	Total			4
Equipment Control	2.2.13	Knowledge of tagging and clearance procedures #34	3.6/3.8	1
	2.2.22	Knowledge of LCOs and safety limits #35	3.4/4.1	1
	2.2.30	Knowledge of RO duties in the CR during fuel handling #81	3.5	1
	Total			3
Radiation Control	2.3.2	Knowledge of facility ALARA program #36	2.5	1
	2.3.4	Knowledge of radiation exposure limits and contamination control, including those in excess of those authorized #37	2.5/3.1	1
	Total			2
Emergency Procedures/ Plan	2.4.1	Knowledge of EOP entry conditions and immediate action steps #46	4.3/4.6	1
	2.4.24	Knowledge of loss of cooling water procedures #38	3.3/3.7	1
	2.4.46	Ability to verify that the alarms are consistent with plant conditions #84	3.5	1
	2.4.49	Ability to perform w/o reference to procedures that require immediate operation of system components and controls #39	4.0	1
	Total			4
Tier 3 Point Total (RO)				13

Facility: South Texas Project Date of Exam: 09/14/2001 Exam Level: SRO

Category	K/A #	Topic	Imp.	Pts
Conduct of Operations	2.1.7	Evaluate plant performance and make judgements based on Rx, operating char., and instrument interp.	3.7/4.4	1
	2.1.11	Knowledge of less than one hour T.S. action statements	3.0/3.8	1
	2.1.12	*Ability to apply T.S. for a system*	*2.9/4.0*	*1*
	2.1.33	*Ability to recognize indications for system operating parameters which are entry conditions for T.S.*	*3.4/4.0*	*1*
	Total			4
Equipment Control	2.2.13	Knowledge of tagging and clearance procedures	3.6/3.8	1
	2.2.11	*Knowledge of process for controlling temporary changes*	*2.5/3.4*	*1*
	2.2.22	Knowledge of LCOs and safety limits	3.4/4.1	1
	2.2.25	*Knowledge of basis in T.S. for LCOs and safety limits*	*2.5/3.7*	*1*
	2.2.26	*Knowledge of refueling administrative requirements*	*2.5/3.7*	*1*
	Total			5
Radiation Control	2.3.4	Knowledge of radiation exposure limits and contamination control, including those in excess of those authorized	2.5/3.1	1
	2.3.9	*Knowledge of process for performing a containment purge*	*2.5/3.4*	*1*
	2.3.11	*Ability to control radiation releases*	*2.7/3.2*	*1*
	Total			3
Emergency Procedures/ Plan	2.4.1	Knowledge of EOP entry conditions and immediate action steps	4.3/4.6	1
	2.4.9	*Knowledge of low power or S/D implications in accident mitigation strategies*	*3.3/3.9*	*1*
	2.4.24	Knowledge of loss of cooling water procedures	3.3/3.7	1
	2.4.28	*Knowledge of procedures relating to emergency response to sabotage (unable to develop question in this area, procedures are safeguard material)*	*2.3/3.3*	*1*
	2.4.41	*Knowledge of emergency action level thresholds and classifications*	*2.3/4.1*	*1*
	Total			5
Tier 3 Point Total (SRO)				17