Facility: ANO Unit1 Date of Exam: Jan 9, 2004 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	2	3				4	2			2	16
	2	2	4	1				4	5			1	17
	3	0	1	1				1	0			0	3
	Tier Totals	5	7	5				9	7			3	36
2. Plant Systems	1	2	2	2	2	2	1	2	3	2	3	2	23
	2	2	1	3	3	2	2	1	3	1	1	1	20
	3	1	1	0	0	1	0	2	1	1	0	1	8
	Tier Totals	5	4	5	5	5	3	5	7	4	4	4	51

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

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 (R8, S1)
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000005 Inoperable/Stuck Control Rod / 1	1						AK1.02 Knowledge of Operational implications with respect to Flux tilt	3.1	1
000015/17 RCP Malfunctions / 4		1					AK2.08 Knowledge of CCWS and interrelationship with loss of RCS flow	2.6	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4			1				EK3.3 Ability to obtain desired results with controls during nat recirc c/d	3.8	1
000024 Emergency Boration / 1	1						AK1.02 Relationship between boron addition and reactor power	3.6	1
000026 Loss of Component Cooling Water / 8				1			AA1.05 Ability to monitor CCW surge tank/levels/alarms on loss of CCWS	3.1	1
000027 Pressurizer Pressure Control System Malfunction / 3						1	G2.1.7 Ability to evaluate plant performance on loss of Pressurizer Pressure Control	3.7	1
BW/E05 - Excessive Heat Transfer / 4	1						EK1.3 Indicators, alarms, remedial actions associated with exc Heat xfer	3.8	1
CE/A11; W/E08 RCS Overcooling - PTS / 4									0
000051 Loss of Condenser Vacuum / 4			1				AK3.01 Knowledge of reason loose steam dumps when loose cond vac.	2.8	1
000055 Station Blackout / 6				1			EA1.05 Ability to operate during SBO with battery fully discharged	3.3	1
000057 Loss of Vital AC Elec. Inst. Bus / 6					1		AA2.12 Ability to determine PZR level controls/ind on loss of vital AC	3.5	1
000062 Loss of Nuclear Service Water / 4						1	G2.1.23 Ability to perform integrated plant procedures for loss of NSW	3.9	1
000067 Plant Fire On-site / 9									0
000068 Control Room Evac. / 8			1				AK3.07 Maintenance of S/G levels using AFW valves when outside CR	4.0	1
000069 Loss of CTMT Integrity / 5				1			AA1.01 Ability to operate/monitor dampers/valves during loss of containment integrity	3.5	1
000074 Inad. Core Cooling / 4					1		EA2.02 Availability of MFW/AFW during inadequate core cooling	4.3	1
BW/E03 Inadequate Subcooling Margin / 4		1					EK2.2 Knowledge of interrelations of ISCM and all heat removal systems	4.3	1
000076 High Reactor Coolant Activity / 9									0
BW/A02 Loss of NNI-X / 7				1			AA1.02 Ability to monitor operating char. of facility during loss of NNI-X/Y	3.4	1
K/A Category Totals:	3	2	3	4	2	2	Group Point Total:		16

ES-401	PWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2						Form ES-401-4 (R8, S1)		
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1					1		AA2.02 Ability to determine position of Emerg. Bor'n Valve during rod w/d	4.2	1
000003 Dropped Control Rod / 1				1			AA1.06 Ability to monitor RCS PT as it applies to dropped rod	4.0	1
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1				1			EA1.1 Ability to operate components of control/safety systems post trip	4.0	1
BW/A01 Plant Runback / 1			1				AK3.2 Knowledge of all procedures associated with runbacks	3.2	1
BW/A04 Turbine Trip / 4		1					AK2.2 Knowledge of interrelations of turbine trip and heat removal syst's	3.3	1
000008 Pressurizer Vapor Space Accident / 3					1		AA2.27 Ability to determine the effects on PZR level for sensor leakage	2.9	1
000009 Small Break LOCA / 3		1					EK2.03 Knowledge of interrelations of SBLOCA and S/G's	3.0	1
000011 Large Break LOCA / 3		1					EK2.02 Knowledge of interrelations between pumps during large LOCA	2.6	1
W/E04 LOCA Outside Containment / 3									0
BW/E08; W/E03 LOCA Cooldown/Depress. / 4	1						EA1.3 Ability to operate to achieve desired results during LOCA C/D	3.3	1
W/E11 Loss of Emergency Coolant Recirc. / 4									0
W/EO1 & E02 Rediagnosis & SI Termination / 3									0
000022 Loss of Reactor Coolant Makeup / 2						1	G2.1.12 Ability to apply tech specs for a system	2.9	1
000025 Loss of RHR System / 4	1						AK1.01 Knowledge of implications on plant on loss of RHR	3.9	1
000029 Anticipated Transient w/o Scram / 1		1					EK2.06 Knowledge of interrelations between breakers, relays and ATWS	2.9	1
000032 Loss of Source Range NI / 7					1		AK3.02 Knowledge of reasons for guidance in EOP's on loss of SRI	3.7	1
000033 Loss of Intermediate Range NI / 7									0
000037 Steam Generator Tube Leak / 3					1		AA2.06 Ability to determine S/G tube failure	4.3	1
000038 Steam Generator Tube Rupture / 3				1			EA1.08 Ability to operate core cooling monitor during SGTR	3.7	1
000054 (CE/E06) Loss of Main Feedwater / 4									0
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4				1			EA1.3 Ability to obtain desired op results during inadequate heat transfer	3.6	1
000058 Loss of DC Power / 6					1		AK3.01Knowledge of use of DC control pwr by DG's during loss DC pwr	3.4	1
000059 Accidental Liquid RadWaste Rel. / 9									0
000060 Accidental Gaseous Radwaste Rel. / 9									0
000061 ARM System Alarms / 7									0
W/E16 High Containment Radiation / 9									0
CE/E09 Functional Recovery									0
K/A Category Point Totals:	2	4	1	4	5	1	Group Point Total:		17

ES-401	PWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 3							Form ES-401-4 (R8, S1)
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / 2									0
000036 (BW/A08) Fuel Handling Accident / 8									0
000056 Loss of Off-site Power / 6									0
000065 Loss of Instrument Air / 8			1				AK3.04 Knowledge of cross-over to backup air on loss instrument air	3.0	1
BW/E13 EOP Rules and Enclosures		1					E13-EK2.1 Knowledge of interrelations between EOP rules and components and functions of control/safety systems	3.6	1
BW/A05 Emergency Diesel Actuation / 6				1			AA1.3 Ability to operate DG's during Ab/Emergency situations	3.7	1
BW/A07 Flooding / 8									0
CE/A16 Excess RCS Leakage / 2									0
W/E13 Steam Generator Over-pressure / 4									0
W/E15 Containment Flooding / 5									0
K/A Category Point Totals:	0	1	1	1	0	0	Group Point Total:		3

ES-401	PWR RO Examination Outline Plant Systems - Tier 2/Group 1												Form ES-401-4 (R8, S1)	
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive														0
003 Reactor Coolant Pump		1										K2.01 Knowledge of bus power to RCPS	3.1	1
004 Chemical and Volume Control	1		1									K1.16 Knowledge of cause effect relationship between CVCS and boric acid storage tank; K3.05 loss of CVCS on PZR LCS	3.3 3.8	2
013 Engineered Safety Features Actuation		1		1								K2.01 Knowledge of bus power to ESFAS equipment; K4.06 Knowledge of Recirc actuation reset	3.6 4.0	2
015 Nuclear Instrumentation			1		1							K3.04 Loss of NIS effects in ICS K5.02Knowledge of operational implications of disac/compensation operation in NIS	3.4 2.7	2
017 In-core Temperature Monitor				1		1						K4.01Knowledge of ITM design features/intlks that provide for input to subcooling monitors. K6.01 Knowledge of loss of sensor/detector on ITM	3.4 2.7	2
022 Containment Cooling							1			1		A1.01 Ability to predict/monitor Containment temperature to prevent exceeding limits A4.05 Ability to monitor P, T, and humidity for containment	3.6 3.8	2
056 Condensate								1			1	A2.04 Predict and mitigate the consequence of the loss of cond pumps G2.1.30 Ability to locate/operate components, including local controls	2.6 3.9	2
059 Main Feedwater							1		1			A1.03 Ability to predict pwr lvl restrictions for operation of MFW pumps A3.07 Ability to monitor auto operation of MFW with ICS	2.7 3.4	2
061 Auxiliary/Emergency Feedwater								1	1			A2.04 Ability to predict impact on pump failure to AFW system A3.04 Ability to monitor auto operation of AFW auto isolation	3.4 4.1	2
068 Liquid Radwaste					1						1	K5.04 Knowledge of biohazards of radiation and goal wrt ALARA and the LRS G2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation for LRS	3.2 3.9	2
071 Waste Gas Disposal								1		1		A2.02 Ability to predict the impact of WGDS failures and mitigate using monitors/flows A4.25 Ability to set process rad alarms, sp from control room	3.3 3.2	2
072 Area Radiation Monitoring	1									1		K1.04 Knowledge of cause-effect rel-ship between ARM and control room ventilation A4.01Ability to manually operate and/or monitor alarm SP/adjustments	3.3 3.0	2
K/A Category Point Totals:	2	2	2	2	2	1	2	3	2	3	2	Group Point Total:		23

ES-401	PWR RO Examination Outline Plant Systems - Tier 2/Group 2											Form ES-401-4 (R8, S1)		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant						1						K6.12 Knowledge of loss or malfunction of code safety valves for RCS	3.0	1
006 Emergency Core Cooling					1							K5.05 Implications of pressure changes with ECCS on a solid system	3.4	1
010 Pressurizer Pressure Control				1								K4.02 Knowledge of the design to prevent uncovering Pzr heaters	3.0	1
011 Pressurizer Level Control			1									K3.02 Knowledge of loss or malfunction of PZR LCS on RCS	3.5	1
012 Reactor Protection		1										K2.01 Knowledge of bus pwr supplies to RPS channels and components	3.3	1
014 Rod Position Indication	1											K1.01 Knowledge of cause effect relationship between CRDS and RPI	3.2	1
016 Non-nuclear Instrumentation					1							K5.01 Knowledge of separation of control and protective circuits for NNIS	2.7	1
026 Containment Spray											1	G2.4.4Ability to recognize abnormal indications that require EOP/Abnormal procedural entry	4.0	1
029 Containment Purge				1								K4.02 Knowledge of design features that provide negative containment pressure	2.9	1
033 Spent Fuel Pool Cooling			1									K3.01 Knowledge of loss of spent fuel cooling on area ventilation systems.	2.6	1
035 Steam Generator						1						K6.02 Knowledge of effects of loss of secondary PORV's on S/G's	3.1	1
039 Main and Reheat Steam								1				A2.04Ability to predict changs associated with Main steam w/malfunction steam dump	3.4	1
055 Condenser Air Removal			1									K3.01Knowledge loss of CARS on condenser	2.5	1
062 AC Electrical Distribution									1			A3.01 Ability to monitor vital AC bus amps	3.0	1
063 DC Electrical Distribution										1		A4.01 Ability to operate/monitor major breakers from CR	2.8	1
064 Emergency Diesel Generator								1				A2.16 Ability to predict the impact of LOOP during full load EDG testing	3.3	1
073 Process Radiation Monitoring	1											K1.01 Knowledge of those systems connected with PRM's	3.6	1
075 Circulating Water								1				A2.03 Predict impact of loss of CW on vacuum, steam dumps, turbine, & mitigate	2.5	1
079 Station Air				1								K4.01 Knowledge of SAS x-con to IAS	2.9	1
086 Fire Protection							1					A1.01 Ability to predict/monitor changes in parameters assoc with fire header pressure	2.9	1
K/A Category Point Totals:	2	1	3	3	2	2	1	3	1	1	1	Group Point Total:		20

ES-401	PWR RO Examination Outline Plant Systems - Tier 2/Group 3												Form ES-401-4 (R8, S1)	
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal														
007 Pressurizer Relief/Quench Tank														
008 Component Cooling Water														0
027 Containment Iodine Removal	1											K1.01Knowledge of inter-relationship to CSS	3.4	1
028 Hydrogen Recombiner and Purge Control								1				A2.01 determine the HRPS from the plant data book	3.4	1
034 Fuel Handling Equipment							1					A1.02 Ability to monitor/predict changes to prevent exceeding limits for fuel canal water level	2.9	1
041 Steam Dump/Turbine Bypass Control					1							K5.07 Knowledge of operational implication of reactivity feedback effects on SDS	3.1	1
045 Main Turbine Generator							1					A1.05 Ability to predict the expected response of the primary plant on MTG trip	3.8	1
076 Service Water		1										K2.08 Knowledge of bus power to ESF actuated MOV's for SWS	3.1	1
078 Instrument Air											1	G2.1.28 Knowledge of purpose/function of major system components and controls	3.2	1
103 Containment									1			A3.01 Ability to monitor the automatic isolation of containment	3.9	1
K/A Category Point Totals:	1	1	0	0	1	0	2	1	1	0	1	Group Point Total:		8

Plant-Specific Priorities

System / Topic	Recommended Replacement for...	Reason	Points
Plant-Specific Priority Total: (limit 10)			

RO only

Facility:	Date of Exam:			Exam Level:
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.2	Knowledge of Operator Resp. during all modes	3.0	1
	2.1.7	Ability to evaluate plant performance	3.7	1
	2.1.20	Ability to execute procedure steps	4.3	1
	2.1.32	Ability to explain/apply system limits	3.4	1
	2.1.			
	2.1.			
	Total			4
Equipment Control	2.2.1	Pre Startup procedures	3.7	1
	2.2.2	Manipulate controls at startup and at power	4.0	1
	2.2.22	Knowledge of LCO's and safety limits	3.4	1
	2.2.30	Knowledge of Control Room during fuel handling	3.5	1
	2.2.			
	2.2.			
	Total			4
Radiation Control	2.3.1	Knowledge of 10CFR20 (CFR 41.12)	2.6	1
	2.3.2	Knowledge of facility ALARA program	2.5	1
	2.3.			
	2.3.			
	2.3.			
	2.3.			
	Total			2
Emergency Procedures/ Plan	2.4.1	Knowledge of EOP entry conditions	4.3	1
	2.4.4	Ability to recognize indications for EOPs	4.0	1
	2.4.8	Knowledge of event vs symptom based EOP's	3.0	1
	2.4.			
	2.4.			
	2.4.			
	Total			3
Tier 3 Point Total (RO)				13

Facility: ANO Unit1 Date of Exam: Jan 9, 2004 Exam Level: SRO

Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	3	4	5				6	5			1	24
	2	1	3	4				3	3			2	16
	3	0	0	1				1	1			0	3
	Tier Totals	3	7	10				10	9			3	43
2. Plant Systems	1	1	2	2	2	1	1	1	3	2	2	2	19
	2	2	1	3	2	1	2	2	2	2	0	0	17
	3	0	1	0	0	1	0	1	0	0	0	1	4
	Tier Totals	3	4	5	4	3	3	4	5	4	2	3	40

3. Generic Knowledge and Abilities	Cat 1	Cat 2	Cat 3	Cat 4	17
	6	4	2	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 (R8, S1)
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1					1		AA2.02 Ability to determine position of Emerg. Bor'n Valve during rod w/d	4.2	1
000003 Dropped Control Rod / 1				1			AA1.06 Ability to monitor RCS PT as it applies to dropped rod	4.1	1
000005 Inoperable/Stuck Control Rod / 1	1						AK1.02 Knowledge of Operational implications with respect to Flux tilt	3.9	1
000011 Large Break LOCA / 3		1			1		EK2.02 Knowledge of interrelations between pumps during large LOCA A2.11Conditions for throttling or stopping HPI	2.7 4.3	2
W/E04 LOCA Outside Containment / 3									0
W/EO1 & E02 Rediagnosis & SI Termination / 3									0
000015/17 RCP Malfunctions / 4		1					AK2.08 Knowledge of CCWS and interrelationship with loss of RCS flow	2.6	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4			1				EK3.3 Ability to obtain desired results with controls during nat recirc c/d	3.4	1
000024 Emergency Boration / 1				1			AK1.02 Relationship between boron addition and reactor power	3.9	1
000026 Loss of Component Cooling Water / 8				1			AA1.05 Ability to monitor CCW surge tank/levels/alarms on loss of CCWS	3.1	1
000029 Anticipated Transient w/o Scram / 1		1					EK2.06 Knowledge of interrelations between breakers, relays and ATWS	3.1	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4	1						EK1.3 Indicators, alarms, remedial actions associated with exc Heat xfer	3.8	1
CE/A11; W/E08 RCS Overcooling - PTS / 4									0
000051 Loss of Condenser Vacuum / 4			1				AK3.01 Knowledge of reason loose steam dumps when loose cond vac.	3.1	1
000055 Station Blackout / 6				1			EA1.05 Ability to operate during SBO with battery fully discharged	3.6	1
000057 Loss of Vital AC Elec. Inst. Bus / 6					1		AA2.12 Ability to determine PZR level controls/ind on loss of vital AC	3.7	1
000059 Accidental Liquid RadWaste Rel. / 9			1				AK3.04 Actions in EOP for accidental liquid rad-waste release	4.3	1
000062 Loss of Nuclear Service Water / 4						1	G2.1.23 Ability to perform integrated plant procedures on loss of NSW	4.0	1
000067 Plant Fire On-site / 9					1		AA2.17 Systems that may be affected by a fire	4.3	1
000068 (BW/A06) Control Room Evac. / 8			1				AK3.07 Maintenance of S/G levels using AFW valves when outside CR	4.3	1
000069 (W/E14) Loss of CTMT Integrity / 5				1			AA1.01 Ability to operate/monitor valves/dampers during loss of cont intg	3.7	1
000074 (W/E06&E07) Inad. Core Cooling / 4	1				1		EK1.01 ICC, methods of calc loss of sub-cooling margin EA2.02 Availability of MFW/AFW during inadequate core cooling	4.7 4.6	2
BW/E03 Inadequate Subcooling Margin / 4		1					EK2.2 Knowledge of interrelations of ISCM and all heat removal systems	4.3	1
000076 High Reactor Coolant Activity / 9			1				AK3.06 Actions in EOP for high reactor coolant activity	3.8	1
BW/A02&A03 Loss of NNI-X/Y / 7				1			AA1.2 Ability to monitor operating char. of facility during loss of NNI-X/Y	3.2	1
K/A Category Totals:	3	4	5	6	5	1	Group Point Total:		24

ES-401	PWR SRO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2							Form ES-401-3 (R8, S1)
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1				1			EA1.1 Ability to operate components of control/safety systems post trip	3.5	1
BW/A01 Plant Runback / 1			1				AK3.2 Knowledge of all procedures associated with runbacks	3.6	1
BW/A04 Turbine Trip / 4		1					AK2.2 Knowledge of interrelations of turbine trip and heat removal syst's	3.5	1
000008 Pressurizer Vapor Space Accident / 3					1		AA2.27 Ability to determine the effects on PZR level for sensor leakage	3.2	1
000009 Small Break LOCA / 3		1					EK2.03 Knowledge of interrelations of SBLOCA and S/G's	3.3	1
BW/E08; W/E03 LOCA Cooldown - Depress. / 4			1				EA1.3 Ability to operate to achieve desired results during LOCA C/D	3.8	1
W/E11 Loss of Emergency Coolant Recirc. / 4									0
000022 Loss of Reactor Coolant Makeup / 2						1	G2.1.12 Ability to apply tech specs for a system	4.0	1
000025 Loss of RHR System / 4	1						AK1.01 Knowledge of implications on plant on loss of RHR	4.3	1
000027 Pressurizer Pressure Control System Malfunction / 3						1	G2.1.7 Ability to evaluate plant performance/make judgments for Pzr Pressure Malfunction	4.4	1
000032 Loss of Source Range NI / 7			1				AK3.02 Knowledge of reasons for guidance in EOP's on loss of SRI	4.1	1
000033 Loss of Intermediate Range NI / 7									0
000037 Steam Generator Tube Leak / 3					1		AA2.06 Ability to determine S/G tube failure	4.5	1
000038 Steam Generator Tube Rupture / 3				1			EA1.08 Ability to operate core cooling monitor during SGTR	3.8	1
000054 (CE/E06) Loss of Main Feedwater / 4									0
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4				1	1		EA1.3 Ability to obtain desired op results during inadequate heat transfer EA2.2 Adherence to procedures/operation w/in license/amendments	3.8 4.4	2
000058 Loss of DC Power / 6			1				AK3.01Knowledge of use of DC control pwr by DG's during loss DC pwr	3.7	1
000060 Accidental Gaseous Radwaste Rel. / 9									0
000061 ARM System Alarms / 7									0
W/E16 High Containment Radiation / 9									0
000065 Loss of Instrument Air / 8		1					AK3.04 Knowledge of cross-over to backup air on loss instrument air	3.2	1
CE/E09 Functional Recovery									0
K/A Category Point Totals:	1	3	4	3	3	2	Group Point Total:		16

ES-401	PWR SRO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 3							Form ES-401-3 (R8, S1)
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / 2									0
000036 (BW/A08) Fuel Handling Accident / 8					1		AA2.02 Ability to determine occurrence of fuel handling accident	4.1	1
000056 Loss of Off-site Power / 6									0
BW/E13&E14 EOP Rules and Enclosures			1				E-13, EK2.1Knowledge of interrelations between EOP rules and components and functions of control/safety systems.	3.4	1
BW/A05 Emergency Diesel Actuation / 6				1			AA1.3 Ability to operate DG's during Ab/Emergency situations	3.7	1
BW/A07 Flooding / 8									0
CE/A16 Excess RCS Leakage / 2									0
W/E13 Steam Generator Over-pressure / 4									0
W/E15 Containment Flooding / 5									0
K/A Category Point Totals:	0	0	1	1	1	0	Group Point Total:		3

ES-401	PWR SRO Examination Outline Plant Systems - Tier 2/Group 1											Form ES-401-3 (R8, S1)		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive														0
003 Reactor Coolant Pump		1										K2.01 Knowledge of bus power to RCPS	3.1	1
004 Chemical and Volume Control	1		1									K1.16 Knowledge of cause effect relationship between CVCS and boric acid storage tank; K3.05 loss of CVCS on PZR LCS	3.5 4.2	2
013 Engineered Safety Features Actuation		1		1								K2.01 Knowledge of bus power to ESFAS equipment; K4.06 Knowledge of ESFAS design features	3.8 4.3	2
014 Rod Position Indication														0
015 Nuclear Instrumentation			1		1							K3.04 Loss of NIS effects in ICS K5.02Knowledge of operational implications of disac/compensation operation in NIS	4.0 2.9	2
017 In-core Temperature Monitor				1		1						K4.01Knowledge of ITM design features/intlks that provide for input to subcooling monitors. K6.01 Knowledge of loss of sensor on ITM	3.7 3.0	2
022 Containment Cooling							1			1		A1.01 Ability to predict/monitor Containment temperature to prevent exceeding limits A4.05 Ability to monitor P, T, and humidity for containment	3.7 3.8	2
026 Containment Spray								1			1	G2.4.4 Ability to recognize abnormal indication require EOP/AOP procedural entry A2.04 Predict and mitigate the consequences of the loss of cont spray pumps	4.3 4.2	2
056 Condensate								1				A2.04 Predict and mitigate the consequences of the loss of cond pumps	2.8	1
059 Main Feedwater									1			A3.07 Ability to monitor auto operation of MFW with ICS	3.5	1
061 Auxiliary/Emergency Feedwater									1			A3.04 Ability to monitor auto operation of AFW auto isolation	4.2	1
063 DC Electrical Distribution										1		A4.01 Ability to operate/monitor major breakers from CR	3.1	1
068 Liquid Radwaste											1	G2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation for LRS	4.0	1
071 Waste Gas Disposal								1				A2.02 Ability to predict the impact of WGDS failures and mitigate using monitors/flows	3.6	1
072 Area Radiation Monitoring														0
K/A Category Point Totals:	1	2	2	2	1	1	1	3	2	2	2	Group Point Total:		19

ES-401	PWR SRO Examination Outline Plant Systems - Tier 2/Group 2												Form ES-401-3 (R8, S1)	
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant						1						K6.12 Knowledge of loss or malfunction of code safety valves for RCS	3.5	1
006 Emergency Core Cooling					1							K5.05 Implications of pressure changes with ECCS on a solid system	3.8	1
010 Pressurizer Pressure Control				1								K4.02 Knowledge of the design to prevent uncovering Pzr heaters	3.4	1
011 Pressurizer Level Control			1									K3.02 Knowledge of loss or malfunction of PZR LCS on RCS	3.7	1
012 Reactor Protection		1										K2.01 Knowledge of bus pwr supplies to RPS channels and components	3.7	1
016 Non-nuclear Instrumentation														0
027 Containment Iodine Removal	1											K1.01Knowledge of inter-relationship to CSS	3.7	1
028 Hydrogen Recombiner and Purge Control								1				A2.01 determine the HRPS from the plant data book	3.6	1
029 Containment Purge				1								K4.02 Knowledge of design features that provide negative containment pressure	3.1	1
033 Spent Fuel Pool Cooling			1									K3.01 Knowledge of loss of spent fuel cooling on area ventilation systems.	3.1	1
034 Fuel Handling Equipment							1					A1.02 Ability to monitor/predict changes to prevent exceeding limits: fuel canal water Lvl	3.7	1
035 Steam Generator						1						K6.02 Knowledge of effects of loss of secondary PORV's on S/G's	3.5	1
039 Main and Reheat Steam							1					A2.04Ability to predict changs associated with Main steam w/malfunction steam dump	3.7	1
055 Condenser Air Removal			1									K3.01Knowledge loss of CARS on condensr	2.7	1
062 AC Electrical Distribution									1			A3.01 Ability to monitor vital AC bus amps	3.1	1
064 Emergency Diesel Generator								1				A2.16 Ability to predict the impact of LOOP during full load EDG testing	3.7	1
073 Process Radiation Monitoring	1											K1.01 Knowledge of those systems connected with PRM's	3.9	1
075 Circulating Water														0
079 Station Air														0
086 Fire Protection														0
103 Containment									1			A3.01 Ability to monitor the automatic	4.2	1
K/A Category Point Totals:	2	1	3	2	1	2	2	2	2	0	0	Group Point Total:		17

ES-401	PWR SRO Examination Outline Plant Systems - Tier 2/Group 3											Form ES-401-3 (R8, S1)		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal														0
007 Pressurizer Relief/Quench Tank														0
008 Component Cooling Water														0
041 Steam Dump/Turbine Bypass Control					1							K5.07 Knowledge of operational implication of reactivity feedback effects on SDS	3.6	1
045 Main Turbine Generator							1					A1.05 Ability to predict the expected response of the primary plant on MTG trip	4.1	1
076 Service Water		1										K2.08Knowledge of bus power to ESF actuated MOV's for SWS	3.3	1
078 Instrument Air											1	G2.1.28 Knowledge of purpose/function of major system components and controls	3.3	1
K/A Category Point Totals:	0	1	0	0	1	0	1	0	0	0	1	Group Point Total:		4

Plant-Specific Priorities

System / Topic	Recommended Replacement for...	Reason	Points
Plant-Specific Priority Total: (limit 10)			

SRO only

Facility:	Date of Exam:			Exam Level:
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.4	Knowledge of shift staffing requirements (CFR 43.2)	3.4	1
	2.1.6	Ability to supervise/manage during plant upsets (CFR 43.5)	4.3	1
	2.1.7	Ability to eval plant perform/make judgements (CFR 43.5)	4.4	1
	2.1.10	Knowledge of conditions/limitations of facility license (CFR 43.1)	3.9	1
	2.1.12	Ability to apply TS for a system (CFR 43.5)	4.0	1
	2.1.33	Ability to recognize entry conditions for TS (CFR 43.3)	4.0	1
	Total			6
Equipment Control	2.2.7	Knowledge of conducting tests not in FSAR (CFR 43.3)	3.2	1
	2.2.21	Knowledge of pre/post maint operability req'mts (CFR43.2)	3.5	1
	2.2.23	Ability to track LCO's (CFR 43.2)	3.8	1
	2.2.27	Knowledge of refueling process (CFR 43.6)	3.5	1
	2.2.			
	2.2.			
	Total			4
Radiation Control	2.3.1	Knowledge of 10CFR20 (CFR 43.4)	3.0	1
	2.3.3	Knowledge of SRO responsibilities for aux systems (CFR 43.4)	2.9	1
	2.3.			
	2.3.			
	2.3.			
	2.3.			
	Total			2
Emergency Procedures/ Plan	2.4.1	Knowledge of EOP entry conditions (CFR 43.5)	4.6	1
	2.4.4	Ability to recognize indications for EOPs (CFR 43.2)	4.3	1
	2.4.8	Knowledge of event vs symptom based EOP's (CFR 43.5)	3.7	1
	2.4.22	Knowledge of bases for prior. safety functions (CFR43.5)	4.0	1
	2.4.40	Knowledge of EA level thresholds/classification (CFR 45.11)	4.1	1
	2.4.			
	Total			5
Tier 3 Point Total (SRO)				17