Facility: SONGS 2 & 3 NRC Date of Exam: 06/04/07

Tier	Group	RO K/A Category Points												SRO-Only Points		
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2	G*	Total
1. Emergency & Abnormal Plant Evolutions	1	2	2	4				3	2			5	18	3	3	6
	2	2	1	2				2	1			1	9	2	2	4
	Tier Totals	4	3	6				5	3			6	27	5	5	10
2. Plant Systems	1	3	3	3	4	2	1	1	2	4	1	4	28	2	3	5
	2	1	1	1	0	1	1	2	1	1	1	0	10	0 1	2	3
	Tier Totals	4	4	4	4	3	2	3	3	5	2	4	38	3	5	8

3. Generic Knowledge and Abilities Categories	1	2	3	4	10	1	2	3	4	7
	3	2	2	3		1	2	2	2	

Note:	1.	Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).
	2.	The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.
	3.	Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems that are not included on the outline should be added. Refer to ES-401, Attachment 2, for guidance regarding elimination of inappropriate K/A statements.
	4.	Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.
	5.	Absent a plant specific priority, only those KAs having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
	6.	Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
	7.*	The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.
	8.	On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above. Use duplicate pages for RO and SRO-only exams.
	9.	For Tier 3, select topics from Section 2 of the K/A Catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10CFR55.43

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
007 / Reactor Trip - Stabilization - Recovery / 1						X	EA2.04	Ability to determine or interpret the following as they apply to a reactor trip: If reactor should have tripped but has not done so, manually trip the reactor and carry out actions in ATWS EOP	4.6	76
015 / 17 / RCP Malfunctions / 4						X	AA2.07	Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): Calculation of expected values of flow in the loop with RCP secured	2.9	77
027 / Pressurizer Pressure Control System Malfunction / 3	X						2.1.2	Conduct of Operations: Knowledge of operator responsibilities during all modes of plant operation.	4.0	78
038 / Steam Gen. Tube Rupture / 3	X						2.1.30	Conduct of Operations: Ability to locate and operate components, including local controls.	3.4	79
058 / Loss of DC Power / 6						X	AA2 02	Ability to determine and interpret the following as they apply to the Loss of DC Power: 125V dc bus voltage, low/critical low, alarm	3.6	80
E06 / Loss of Main Feedwater / 4	X						2.1.23	Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.0	81
007 / Reactor Trip - Stabilization - Recovery / 1	X						2.4.50	Emergency Procedures / Plan Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	3.3	39
008 / Pressurizer Vapor Space Accident / 3						X	AA2.26	Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: Probable PZR steam space leakage paths other than PORV or code safety	3.1	40
009 / Small Break LOCA / 3				X			EK3.07	Knowledge of the reasons for the following responses as the apply to the small break LOCA: Increasing indication on CCWS process monitor: indicates in-leakage of radioactive liquids	3.3	41
011 / Large Break LOCA / 3			X				EK2.02	Knowledge of the interrelations between the and the following Large Break LOCA: Pumps	2.6	42
015 / 17 / RCP Malfunctions / 4				X			AK3.03	Knowledge of the reasons for the following responses as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow) : Sequence of events for manually tripping reactor and RCP as a result of an RCP malfunction	3.7	43

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
022 / Loss of Rx Coolant Makeup / 2		X					AK1.03	Knowledge of the operational implications of the following concepts as they apply to Loss of Reactor Coolant Pump Makeup: Relationship between Charging flow and PZR level	3.0	44
025 / Loss of RHR System / 4					X		AA1.01	Ability to operate and / or monitor the following as they apply to the Loss of Residual Heat Removal System: RCS/RHRS Cooldown Rate	3.6	45
026 / Loss of Component Cooling Water / 8	X						2.1.2	Conduct of Operations: Knowledge of operator responsibilities during all modes of plant operation.	3.0	46
027 / Pressurizer Pressure Control System Malfunction / 3					X		AA1.04	Ability to operate and / or monitor the following as they apply to the Pressurizer Pressure Control Malfunctions: Pressure recovery, using emergency-only heaters	3.9	47
038 / Steam Gen. Tube Rupture / 3	X						2.4.6	Emergency Procedures / Plan Knowledge symptom based EOP mitigation strategies.	3.1	48
040 / Steam Line Rupture - Excessive Heat Transfer / 4	X						2.1.32	Conduct of Operations: Ability to explain and apply all system limits and precautions.	3.4	49
056 / Loss of Off-site Power / 6				X			AK3.02	Knowledge of the reasons for the following responses as they apply to the Loss of Offsite Power: Actions contained in EOP for loss of offsite power	4.4	50
057 / Loss of Vital AC Inst. Bus / 6						X	AA2 03	Ability to determine and interpret the following as they apply to the Loss of Vital AC Instrument Bus: RPS panel alarm annunciators and trip indicators	3.7	51
058 / Loss of DC Power / 6	X						2.4.6	Emergency Procedures / Plan Knowledge symptom based EOP mitigation strategies.	3.1	52
062 / Loss of Nuclear Svc. Water / 4				X			AK3.03	Knowledge of the reasons for the following responses as they apply to the Loss of Nuclear Service Water Guidance actions contained in EOP for Loss of nuclear service water	4.0	53
E02 / Reactor Trip - Stabilization - Recovery / 1		X					EK1.1	Knowledge of the operational implications of the following concepts as they apply to the (Reactor Trip Recovery) Components, capacity, and function of emergency systems.	2.9	54
E05 / Steam Line Rupture - Excessive Heat Transfer / 4			X				EK2.2	Knowledge of the interrelations between the (Excess Steam Demand) and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.	3.7	55

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
E06 / Loss of Main Feedwater / 4					X		EA1.1	Ability to operate and / or monitor the following as they apply to the (Loss of Feedwater) Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	4.0	56
K/A Category Point Totals:	8	2	2	4	3	5	Group Point Total:			**18/6**

NRC Written Examination Outline

Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
024 / Emergency Boration / 1						X	AA2.01	Ability to determine and interpret the following as they apply to the Emergency Boration: Whether boron flow and/or MOVs are malfunctioning, from plant conditions	4.1	82
061 / ARM System Alarms / 7	X						2.1.30	Conduct of Operations: Ability to locate and operate components, including local controls.	3.4	83
069 / Loss of CTMT Integrity / 5						X	AA2.01	Ability to determine and interpret the following as they apply to the Loss of Containment Integrity: Loss of containment integrity	4.3	84
A13 / Natural Circ. / 4	X						2.1.32	Conduct of Operations: Ability to explain and apply all system limits and precautions.	3.8	85
001 / Continuous Rod Withdrawal / 1					X		AA1.05	Ability to operate and/or monitor the following as applied to a Continuous Rod Withdrawal: Reactor trip switches	4.3	57
024 / Emergency Boration / 1			X				AK2.03	Knowledge of the interrelations between the Emergency Boration and the following: Controllers and positioners	2.6	58
037 /Steam Generator Tube Leak / 2		X					AK1.02	Knowledge of the operational implications of the following concepts as they apply to the steam generator tube leak: Leak Rate vs. pressure drop	3.1	59
036 / Fuel Handling Accident / 8						X	AA2.03	Ability to determine and interpret the following as they apply to the Fuel Handling Incidents: Magnitude of potential radioactive release	3.1	60
037 / Steam Generator Tube Leak / 3				X			AK3.04	Knowledge of the reasons for the following responses as they apply to the Steam Generator Tube Leak: Use of "feed and bleed" process	2.5	61
059 / Accidental Liquid Radwaste Release / 9	X						2.1.2	Conduct of Operations: Knowledge of operator responsibilities during all modes of plant operation.	3.0	62
068 / Control Room Evacuation / 8					X		AA1.26	Ability to operate and / or monitor the following as they apply to the Control Room Evacuation: Unlocking of switches and operation of AFW valves	3.6	63
076 / High Reactor Coolant Activity / 9				X			AK3.05	Knowledge of the reasons for the following responses as they apply to the High Reactor Coolant Activity : Corrective actions as a result of high fission-product radioactivity level in the RCS	2.9	64
E09 / Functional Recovery		X					EK1.2	Knowledge of operational implications of the following concepts as they apply to the (Functional Recovery) Normal, abnormal and emergency operating procedures associated with (Functional Recovery).	3.2	65
K/A Category Point Total:	3	2	1	2	2	3	Group Point Total:			**9/4**

NRC Written Examination Outline
Plant Systems – Tier 2 Group 1

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
004 Chemical and Volume Control	X											2.1.23	Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.0	86
005 Residual Heat Removal									X			A2.04	Ability to (a) predict the impacts of the following malfunctions or operations on the RHRS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: RHR valve malfunction	2.9	87
006 Emergency Core Cooling	X											2.1.30	Conduct of Operations: Ability to locate and operate components, including local controls.	3.4	88
006 Emergency Core Cooling	X											2.2.25	Equipment Control Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	89
062 AC Electrical Distribution									X			A2.12	Ability to (a) predict the impacts of the following malfunctions or operations on the ac distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Restoration of power to a system with a fault on it	3.6	90
003 Reactor Coolant Pump					X							K4.07	Knowledge of RCPS design feature(s) and/or interlock(s) which provide for the following: Minimizing RCS leakage (mechanical seals)	3.2	1
003 Reactor Coolant Pump		X										K1.01	Knowledge of the physical connections and/or cause-effect relationships between the RCPS and the following systems: RCP lube oil	2.6	2
004 Chemical and Volume Control				X								K3.02	Knowledge of the effect that a loss or malfunction of the CVCS will have on the following: PZR LCS	3.7	3
005 Residual Heat Removal											X	A4.02	Ability to manually operate and/or monitor in the control room: Heat exchanger bypass flow control	3.4	4
006 Emergency Core Cooling								X				A1.05	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ECCS controls including: CCW flow (establish flow to RHR heat exchanger prior to placing in service)	2.9	5
006 Emergency Core Cooling			X									K2.04	Knowledge of bus power supplies to the following: ESFAS-operated valves	3.6	6
007 Pressurizer Relief/Quench Tank						X						K5.02	Knowledge of the operational implications of the following concepts as the apply to PRTS: Method of forming a steam bubble in the PZR	3.1	7

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
008 Component Cooling Water		X										K1.05	Knowledge of the physical connections and/or cause-effect relationships between the CCWS and the following systems: Sources of makeup water	3.0	8
008 Component Cooling Water										X		A3.05	Ability to monitor automatic operation of the CCWS, including: Control of the electrically operated, automatic isolation valves in the CCWS	3.0	9
010 Pressurizer Pressure Control		X										K1.05	Knowledge of the physical connections and/or cause-effect relationships between the PZR PCS and the following systems: PRTS	3.4	10
012 Reactor Protection										X		A3.02	Ability to monitor automatic operation of the RPS, including: Bistables	3.6	11
012 Reactor Protection					X							K4.04	Knowledge of RPS design feature(s) and/or interlock(s) which provide for the following: Redundancy	3.1	12
013 Engineered Safety Features Actuation				X								K3.01	Knowledge of the effect that a loss or malfunction of the ESFAS will have on the following: Fuel	4.4	13
013 Engineered Safety Features Actuation	X											2.2.22	Equipment Control Knowledge of limiting conditions for operations and safety limits.	3.4	14
022 Containment Cooling									X			A2.04	Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of service water	2.9	15
026 Containment Spray			X									K2.02	Knowledge of bus power supplies to the following: MOVs	2.7	16
039 Main and Reheat Steam				X								K3.06	Knowledge of the effect that a loss or malfunction of the MRSS will have on the following: SDS	2.8	17
059 Main Feedwater	X											2.4.6	Emergency Procedures / Plan Knowledge symptom based EOP mitigation strategies.	3.1	18
061 Auxiliary/Emergency Feedwater						X						K5.03	Knowledge of the operational implications of the following concepts as the apply to the AFW: Pump head effects when control valve is shut	2.6	19
061 Auxiliary/Emergency Feedwater										X		A3.05	Ability to monitor automatic operation of the AFW, including: Recognition of leakage, using sump level changes	2.5	20
062 AC Electrical Distribution					X							K4.06	Knowledge of ac distribution system design feature(s) and/or interlock(s) which provide for the following: One-line diagram of 6.9kV distribution, including sources of normal and alternative power	2.9	21

NRC Written Examination Outline
Plant Systems – Tier 2 Group 1

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
063 DC Electrical Distribution	X											2.2.22	Equipment Control Knowledge of limiting conditions for operations and safety limits.	3.4	22
064 Emergency Diesel Generator							X					K6.07	Knowledge of the effect of a loss or malfunction of the following will have on the ED/G system: Air receivers	2.7	23
073 Process Radiation Monitoring					X							K4.01	Knowledge of PRM system design feature(s) and/or interlocks which provide for the following: Release termination when radiation exceeds setpoint	4.0	24
076 Service Water			X									K2.08	Knowledge of bus power supplies to the following: ESF-actuated MOVs	3.1	25
076 Service Water									X			A2.01	Ability to (a) predict the impacts of the following malfunctions or operations on the SWS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of SWS	3.5	26
078 Instrument Air	X											2.1.23	Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.	3.9	27
103 Containment										X		A3.01	Ability to monitor automatic operation of the contain-ment system, including: Containment isolation	3.9	28
K/A Category Point Totals:	7	3	3	3	4	2	1	1	4	4	1	Group Point Total:			**28/5**

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
017 In-core Temperature Monitor									X			A2.01	Ability to (a) predict the impacts of the following malfunctions or operations on the ITM system; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Thermocouple open and short circuits	3.5	91
041 Steam Dump/Turbine Bypass Control	X											2.4.49	Emergency Procedures / Plan Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.0	92
056 Condensate System	X											2.1.28	Conduct of Operations: Knowledge of the purpose and function of major system components and controls.	3.3	93
001 Control Rod Drive								X				A1.11	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CRDS controls including: Required primary system subcooling during shutdown; location of indication	3.7	29
015 Nuclear Instrumentation							X					K6.04	Knowledge of the effect of a loss or malfunction on the following will have on the NIS: Bistables and logic circuits	3.1	30
017 In-core Temperature Monitor				X								K3.01	Knowledge of the effect that a loss or malfunction of the ITM system will have on the following: Natural circulation indications	3.5	31
027 Containment Iodine Removal			X									K2.01	Knowledge of bus power supplies to the following: Fans	3.1	32
029 Containment Purge								X				A1.02	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the Containment Purge System controls including: Radiation levels	3.4	33
035 Steam Generator						X						K5.03	Knowledge of operational implications of the following concepts as the apply to the S/GS: Shrink and swell concept	2.8	34
045 Main Turbine Generator		X										K1.20	Knowledge of the physical connections and/or cause-effect relationships between the MT/G system and the following systems: Protection system	3.4	35

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
068 Liquid Radwaste									X			A2.02	Ability to (a) predict the impacts of the following malfunctions or operations on the Liquid Radwaste System ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Lack of tank recirculation prior to release	2.7	36
072 Area Radiation Monitoring										X		A3.01	Ability to monitor automatic operation of the ARM system, including: Changes in ventilation alignment	2.9	37
079 Station Air											X	A4.01	Ability to manually operate and/or monitor in the control room: Cross-tie valves with IAS	2.7	38
K/A Category Point Totals:	2	1	1	1	0	1	1	2	2	1	1	Group Point Total:			**10/3**

Facility:		Date of Exam:	1/31/2007			
Category	K/A #	Topic	RO		SRO-Only	
			IR	Q#	IR	Q#
1. Conduct of Operations	2.1.22	Ability to determine Mode of Operation.			3.3	94
	2.1.25	Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data.	2.8	66		
	2.1.28	Knowledge of the purpose and function of major system components and controls.	3.2	67		
	2.1.33	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.	3.4	68		
	Subtotal			3		1
2. Equipment Control	2.2.10	Knowledge of the process for determining if the margin of safety, as defined in the basis of any technical specification is reduced by a proposed change, test or experiment.			3.3	95
	2.2.19	Knowledge of maintenance work order requirements.			3.1	96
	2.2.12	Knowledge of surveillance procedures.	3.0	69		
	2.2.27	Knowledge of the refueling process.	2.6	70		
	Subtotal			2		2
3. Radiation Control	2.3.8	Knowledge of the process for performing a planned gaseous radioactive release.			3.2	97
	2.3.2	Knowledge of facility ALARA program.			2.9	98
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5	71		
	2.3.1	Knowledge of 10 CFR: 20 and related facility radiation control requirements	2.6	72		
	Subtotal			2		2
4. Emergency Procedures / Plan	2.4.46	Ability to verify that the alarms are consistent with the plant conditions.			3.6	99
	2.4.38	Ability to take actions called for in the facility emergency plan, including (if required) supporting or acting as emergency coordinator.			4.0	100
	2.4.25	Knowledge of fire protection procedures.	2.9	73		
	2.4.7	Knowledge of event based EOP mitigation strategies.	3.1	74		
	2.4.10	Knowledge of annunciator response procedures.	3.0	75		
	Subtotal			3		2
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
1 / 1	022 AK1.01	Q #44 - No relation at facility. Randomly reselected 022 AK1.03
1 / 1	025 AA1.18	Q #45 - Component does not exist. Randomly reselected 025 AA1.01
1 / 2	001 AA1.03	Q #57 - No relation at facility. Randomly reselected 001 AA1.05
1 / 2	033 G2.4.50	Q #59 - No intermediate range instruments at facility. Randomly reselected 037 AK1.02
1 / 2	068 AA1.22	Q #63 - No flow control valve at facility; Charging Pumps are positive displacement. Randomly reselected 068 AA1.26
2 / 1	004 K3.04	Q #03 - No relation at facility. Randomly reselected 004 K3.02
2 / 1	073 K4.02	Q #24 - No relation at facility. Randomly reselected 073 K4.01
2 / 2	028 K2.01	Q #32 - System abandoned in place. Randomly reselected 027 K2.01
2 / 2	068 A2.03	Q #36 - Not performed at facility. Randomly reselected 068 A2.02