

Facility:		SONGS 2 & 3 NRC												Date of Exam:		10/18/10	
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	3	3				3	3				4	18	3	3	6
	2	2	1	3				0	2				1	9	4	0	4
	Tier Totals	4	4	6				3	5				5	27	7	3	10
2. Plant Systems	1	3	2	2	4	2	2	3	2	2	3	3	28	2	3	5	
	2	1	1	1	1	1	1	0	1	1	1	1	10	1	0	3	
	Tier Totals	4	3	3	5	3	3	3	3	3	4	4	38	3	5	8	
3. Generic Knowledge and Abilities Categories		1		2		3		4		10		1	2	3	4	7	
		2		3		3		2				1	2	2	2		
<p>Note:</p> <ol style="list-style-type: none"> <li>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).</li> <li>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 <math>\pm 1</math> 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.</li> <li>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 / evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.</li> <li>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.</li> <li>5. Absent a plant-specific priority, only those K/As 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.</li> <li>6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.</li> <li>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. Refer to Section D.1.b of ES-401 for the applicable K/As.</li> <li>8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) 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; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.</li> <li>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 10 CFR 55.43.</li> </ol>																	

SONGS 2 & 3  
NRC Written Examination Outline  
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

E/APE # / Name Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	Imp.	Q#
015/017 / RCP Malfunctions / 4						X	2.2.44	Equipment Control: Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions	4.4	76
065 / Loss of Instrument Air / 8					X		AA2.03	Ability to determine and interpret the following as they apply to the Loss of Instrument Air: Location and isolation of leaks	2.9	77
029 / ATWS / 1						X	2.4.6	Emergency Procedures/Plan: Knowledge of EOP mitigation strategies	4.7	78
CE / E06 / Loss of Main Feedwater / 4					X		EA2.1	Ability to determine and interpret the following as they apply to the Loss of Feedwater: Facility conditions and selection of appropriate procedures during abnormal and emergency operations	3.9	79
009 / Small Break LOCA / 3						X	2.4.41	Emergency Procedures/Plan: Knowledge of emergency action level thresholds and classifications	4.6	80
011 Large Break LOCA / 3					X		EA2.03	Ability to determine or interpret the following as they apply to a Large Break LOCA: Consequences of managing LOCA with loss of CCW	4.2	81
CE / E02 / Reactor Trip - Stabilization - Recovery / 1						X	2.1.31	Conduct of Operations: Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup	4.6	39
008 / Pressurizer Vapor Space Accident / 3				X			AA1.08	Ability to operate and/or monitor the following as they apply to the Pressurizer Vapor Space Accident: PRT level, pressure, and temperature	3.8	40
009 / Small Break LOCA / 3			X				EK3.22	Knowledge of the reasons for the following responses as they apply to the Small Break LOCA: Maintenance of heat sink	4.4	41
011 / Large Break LOCA / 3					X		EA2.11	Ability to determine and interpret the following as they apply to a Large Break LOCA: Conditions for throttling or stopping HPI	3.9	42

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E/APE # / Name Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	Imp.	Q#
015 / 17 / RCP Malfunctions / 4	X						AK1.02	Knowledge of the operational implications of the following concepts as they apply to RCP Malfunctions (Loss of RC Flow): Consequences of an RCP failure	3.7	43
025 / Loss of RHR System / 4			X				AK3.01	Knowledge of the reasons for the following responses as they apply to the Loss of Residual Heat Removal System: Shift to alternate flowpath	3.1	44
022 / Loss of Reactor Coolant Makeup / 2						X	2.1.19	Conduct of Operations: Ability to use plant computers to evaluate system or component status	3.9	45
027 / Pressurizer Pressure Control System Malfunction / 3		X					AK2.03	Knowledge of the interrelations between the Pressurizer Pressure Control Malfunctions and the following: Controllers and positioners	2.6	46
CE / E05 / Excess Steam Demand / 4					X		EA2.1	Ability to determine and interpret the following as they apply to the Excess Steam Demand: Facility conditions and selection of appropriate procedures during abnormal and emergency operations	2.7	47
038 / Steam Generator Tube Rupture / 3	X						EK1.02	Knowledge of the operational implications of the following concepts as they apply to the Steam Generator Tube Rupture: Leak rate versus pressure drop	3.2	48
CE / E06 / Loss of Feedwater / 4		X					EK2.1	Knowledge of the interrelations between the Loss of Feedwater and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.3	49
056 / Loss of Offsite 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 Instrument Bus / 6				X			AA1.05	Ability to operate and/or monitor the following as they apply to the Loss of Vital AC Instrument Bus: Backup instrument indications	3.2	51

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E/APE # / Name Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	Imp.	Q#
058 / Loss of DC Power / 6				X			AA1.03	Ability to operate and/or monitor the following as they apply to the Loss of DC power: Vital and battery bus components	3.1	52
062 / Loss of Nuclear Service Water / 4						X	2.4.4	Emergency Procedures/Plan: Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures	4.5	53
055 / Station Blackout / 6					X		EA2.02	Ability to determine and interpret the following as they apply to the Station Blackout: RCS core cooling through natural circulation cooling to SG cooling	4.4	54
077 / Generator Voltage and Electric Grid Disturbances / 6		X					AK2.02	Knowledge of the interrelations between Generator Voltage and Electric Grid Disturbances and the following: Breakers, relays	3.1	55
029 / ATWS / 1						X	2.1.7	Conduct of Operations: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.4	56
K/A Category Point Totals:	2	3	3	3	3 / 3	4 / 3	Group Point Total:		18 / 6	

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NRC Written Examination Outline  
Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

E/APE # / Name Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	Imp.	Q#
036 / Fuel Handling Accident / 8					X		AA2.02	Ability to determine and interpret the following as they apply to the Fuel Handling Incidents: Occurrence of a fuel handling incident	4.1	82
A11 / RCS Overcooling-PTS / 4					X		AA2.2	Ability to determine and interpret the following as they apply to the RCS Overcooling: Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.	3.4	83
032 / Loss of Source Range NI / 7					X		AA2.01	Ability to determine and interpret the following as they apply to the Loss of Source Range Nuclear Instrumentation: Normal/abnormal power supply operation	2.9	84
069 / Loss of Containment 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	85
074 / Inadequate Core Cooling / 4					X		EA2.07	Ability to determine and interpret the following as they apply to an Inadequate Core Cooling: The difference between a LOCA and inadequate core cooling, from trends and indicators	4.1	57
028 / Pressurizer Level Malfunction / 2			X				AK3.05	Knowledge of the reasons for the following responses as they apply to the Pressurizer Level Control Malfunction: Actions contained in EOP for PZR level malfunction	3.7	58
005 / Inoperable/Stuck Control Rod / 1		X					AK2.03	Knowledge of the interrelations between the Inoperable/Stuck Control Rod and the following: Metroscope	3.1	59
036 / Fuel Handling Accident / 8				X			AA1.02	Ability to operate and/or monitor the following as they apply to the Fuel Handling Incidents: ARM system	3.1	60
060 / Accidental Gaseous Radwaste Release / 9			X				AK3.02	Knowledge of the reasons for the following responses as they apply to the Accidental Gaseous Radwaste Release: Isolation of the auxiliary building ventilation.	3.3	61
003 / Dropped Control Rod / 1	X						AK1.04	Knowledge of the operational implications of the following concepts as they apply to the Dropped Control Rod: Effects of power level and control position on flux	3.1	62

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Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

E/APE # / Name Safety Function	K1	K2	K3	A1	A2	G	Number	K/A Topic(s)	Imp.	Q#
051 / Loss of Condenser Vacuum / 4			X				AK3.01	Knowledge of the reasons for the following responses as they apply to the Loss of Condenser Vacuum: Loss of steam dump capability upon loss of condenser vacuum	2.8	63
037 / Steam Generator Tube Leak / 3						X	2.1.7	Conduct of Operations: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretations	4.4	64
067 / Plant Fire on Site / 8	X						AK1.02	Knowledge of the operational implications of the following concepts as they apply to the Plant Fire on Site: Fire fighting	3.1	65
K/A Category Point Totals:	1	1	3	1	2 / 4	1 / 0	Group Point Total:			9 / 4

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NRC Written Examination Outline  
Plant Systems – Tier 2 Group 1

System #/Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topics	Imp.	Q#
022 / Containment Cooling											X	2.4.1	Emergency Procedures/Plan: Knowledge of EOP entry conditions and immediate action steps	4.8	86
026 / Containment Spray								X				A2.07	Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of containment spray pump suction when in recirculation mode, possibly caused by clogged sump screen, pump inlet high temperature exceeded cavitation, voiding, or sump level below cutoff (interlock) limit	3.9	87
061 / Auxiliary/Emergency Feedwater											X	2.1.7	Conduct of Operations: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation	4.7	88
005 / Residual Heat Removal											X	2.2.22	Equipment Control: Knowledge of limiting conditions for operations and safety limits	4.7	89
006 / Emergency Core Cooling								X				A2.10	Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Low boron concentration in SIS	3.9	90
003 / Reactor Coolant Pump	X											K1.03	Knowledge of the physical connections and/or cause-effect relationships between the RCPS and the following systems: RCP seal system	3.3	1
004 / Chemical and Volume Control				X								K4.03	Knowledge of the CVCS design feature(s) and/or interlock(s) which provide for the following: Protection of the ion exchangers (high letdown temperature will isolate ion exchangers)	2.8	2
004 / Chemical and Volume Control					X							K5.04	Knowledge of the operational implications of the following concepts as they apply to the CVCS: Reason for hydrogen cover gas in VCT (oxygen scavenge)	2.8	3

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NRC Written Examination Outline  
Plant Systems – Tier 2 Group 1

System #/Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topics	Imp.	Q#
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		A4.02	Ability to manually operate and/or monitor in the control room: Valves	4.0	5
006 / Emergency Core Cooling						X						K6.03	Knowledge of the effect of a loss or malfunction on the following will have on the ECCS: Safety Injection Pumps	3.6	6
007 / Pressurizer Relief / Quench Tank			X									K3.01	Knowledge of the effect that a loss or malfunction of the PRTS will have on the following: Containment	3.3	7
008 / Component Cooling Water				X								K4.07	Knowledge of CCWS design feature(s) and/or interlock(s) which provide for the following: Operation of the CCW swing bus power supply and its associated breakers and controls	2.6	8
010 / Pressurizer Pressure Control							X					A1.07	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PZR PCS controls including: RCS pressure	3.7	9
012 / Reactor Protection						X						K6.06	Knowledge of the effect of a loss or malfunction of the following will have on the RPS: Sensors and detectors	2.7	10
012 / Reactor Protection									X			A3.03	Ability to monitor automatic operation of the RPS, including: Power supply	3.4	11
013 / Engineered Safety Features Actuation								X				A2.03	Ability to (a) predict the impacts of the following malfunctions or operations on the ESFAS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Rapid depressurization	4.4	12
022 / Containment Cooling									X			A3.01	Ability to monitor automatic operation of the CCS, including: Initiation of safeguards mode of operation	4.1	13
022 / Containment Cooling											X	2.1.7	Conduct of Operations: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation	4.4	14



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NRC Written Examination Outline  
Plant Systems – Tier 2 Group 1

System #/Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topics	Imp.	Q#
026 / Containment Spray								X				A2.02	Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Failure of automatic recirculation transfer	4.2	15
026 / Containment Spray				X								K4.07	Knowledge of the CSS design feature(s) and/or interlock(s) which provide for the following: Adequate level in the containment sump for suction (interlock)	3.8	16
039 / Main and Reheat Steam										X		A4.03	Ability to manually operate and/or monitor in the control room: MFW pump turbines	2.8	17
059 / Main Feedwater							X					A1.07	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MFW controls, including: Feed Pump speed, including normal control speed for ICS	2.5	18
061 / Auxiliary/Emergency Feedwater		X										K2.01	Knowledge of the bus power supplies to the following: AFW system MOVs	3.2	19
062 / AC Electrical Distribution											X	2.1.28	Conduct of Operations: Knowledge of the purpose and function of major system components and controls	4.1	20
062 / AC Electrical Distribution	X											K1.04	Knowledge of the physical connections and/or cause-effect relationships between the AC Electrical Distribution System and the following systems: Offsite power sources	3.7	21
063 / DC Electrical Distribution	X											K1.02	Knowledge of the physical connections and/or cause-effect relationships between the DC Electrical Distribution System and the following systems: AC electrical system	2.7	22
064 / Emergency Diesel Generator		X										K2.01	Knowledge of the bus power supplies to the following: Air compressor	2.7	23
064 / Emergency Diesel Generator			X									K3.03	Knowledge of the effect that a loss or malfunction of the EDG system will have on the following: EDG (manual loads)	3.6	24

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Plant Systems – Tier 2 Group 1

System #/Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topics	Imp.	Q#
073 / Process Radiation Monitoring					X							K5.03	Knowledge of the operational implications of the following concepts as they apply to the PRM system: Relationship between radiation intensity and exposure limits	2.9	25
076 / Service Water				X								K4.03	Knowledge of SWS design feature(s) and/or interlock(s) which provide for the following: Automatic opening features associated with SWS isolation valves to CCW heat exchangers	2.9	26
078 / Instrument Air											X	2.2.37	Equipment Control: Ability to determine operability and/or availability of safety related equipment	3.6	27
103 / Containment							X					A1.01	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the containment controls including: Containment pressure, temperature, and humidity	3.7	28
K/A Category Point Totals:	3	2	2	4	2	2	3	2 / 2	2	3	3 / 3	Group Point Total:		28 / 5	

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NRC Written Examination Outline  
Plant Systems – Tier 2 Group 2

System #/Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	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	2.8	91
072 / Area Radiation Monitoring											X	2.2.12	Equipment Control: Knowledge of surveillance procedures	4.1	92
086 / Fire Protection											X	2.4.31	Emergency Procedures/Plan: Knowledge of annunciator alarms, indications, or response procedures	4.1	93
027 / Containment Iodine Removal		X										K2.01	Knowledge of bus power supplies to the following: Fans	3.1	29
055 / Condenser Air Removal									X			A3.03	Ability to monitor automatic operation of the CARS, including: Automatic diversion of CARS exhaust	2.5	30
086 / Fire Protection					X							K5.04	Knowledge of the operational implication of the following concepts as they apply to the Fire Protection System: Hazards to personnel as a result of fire type and methods of protection	2.9	31
041 / Steam Dump/Turbine Bypass Control										X		A4.06	Ability to manually operate and/or monitor in the control room: Atmospheric relief valve controllers	2.9	32
014 / Rod Position Indication				X								K4.03	Knowledge of RPIS design feature(s) and/or interlock(s) which provide for the following: Rod bottom lights	3.2	33
072 / Area Radiation Monitoring											X	2.1.27	Conduct of Operations: Knowledge of system purpose and/or function	3.9	34
035 / Steam Generator						X						K6.01	Knowledge of the effect of a loss or malfunction of the following will have on the SGS: MSIVs	3.2	35

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Plant Systems – Tier 2 Group 2

System #/Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Number	K/A Topics	Imp.	Q#
017 / Incore Temperature Monitoring								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	3.1	36
015 / Nuclear Instrumentation	X											K 1.08	Knowledge of the physical connections and/or cause-effect relationships between the NIS and the following systems: RCS (pump start)	2.6	37
045 / Main Turbine Generator			X									K3.01	Knowledge of the effect that a loss or malfunction of the MTG system will have on the following: Remainder of the plant	2.9	38
K/A Category Point Totals:	1	1	1	1	1	1	0	1 / 1	1	1	1 / 2	Group Point Total:			10 / 3

Facility: SONGS 2 & 3 NRC			Date of Exam: 10/18/2009			
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.5	Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.			3.9	94
	2.1.19	Ability to use plant computers to evaluate system or component status	3.9	66		
	2.1.30	Ability to locate and operate components, including local controls	4.4	67		
	Subtotal			2		1
2. Equipment Control	2.2.23	Ability to track Technical Specification limiting conditions for operations			4.6	95
	2.2.7	Knowledge of the process for conducting special or infrequent tests			3.6	96
	2.2.22	Knowledge of limiting conditions for operations and safety limits	4.0	68		
	2.2.13	Knowledge of tagging and clearance procedures	4.1	69		
	2.2.2	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels	4.6	70		
	Subtotal			3		2
3. Radiation Control	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions			3.7	97
	2.3.6	Ability to approve release permits			3.8	98
	2.3.7	Ability to comply with radiation work permit requirements during normal or abnormal conditions	3.5	71		
	2.3.15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	2.9	72		
	2.3.12	Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.	3.2	73		
	Subtotal			3		2
4. Emergency Procedures / Plan	2.4.40	Knowledge of SRO responsibilities in emergency plan implementation			4.5	99
	2.4.44	Knowledge of emergency plan protective action recommendations			4.4	100
	2.4.3	Ability to identify post accident instrumentation	3.7	74		
	2.4.11	Knowledge of abnormal condition procedures	4.0	75		
	Subtotal			2		2
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
2 / 2	016 K5.01	Q #31 – Unable to develop a psychometrically sound question that discriminates at the RO license level. Randomly reselected 086 K5.04.
1 / 1	011 EA2.09	Q #42 – This specific K/A adequately covered by Question #54. Randomly reselected 011 EA2.11.
1 / 2	074 EA2.05	Q #57 – Unable to develop a psychometrically sound question that discriminates at the RO license level. Reselected 074 EA2.07.
1 / 1	015/017 AA2.07	Q #76 – Unable to develop a psychometrically sound question that discriminates at the SRO license level. Randomly reselected 015/017 G 2.2.44.
1 / 1	011 G 2.4.3	Q #81 – Unable to develop an appropriate SRO level question that discriminates at the SRO license level. Reselected 011 EA2.03.
1 / 2	001 G 2.4.1	Q #83 – Unable to develop a psychometrically sound question that discriminates at the SRO license level. Automatic Rod Control has been disabled at SONGS. Randomly reselected A11 AA2.2.
1 / 1	077 AK2.03	Q #55 – Unable to develop a psychometrically sound question that is considered important to safety. Randomly reselected 077 AK2.02.
1 / 2	032 AA2.02	Q #84 – Unable to develop a psychometrically sound question that discriminates at the SRO license level. Reselected 032 AA2.01.
1 / 2	068 AA2.07	Q #85 – Unable to develop a psychometrically sound question that discriminates at the SRO license level. Reselected 069 AA2.01.
2 / 1	061 A2.07	Q #88 – Unable to develop a psychometrically sound question that discriminates at the SRO license level. Reselected 061 G 2.1.7.
1 / 2	060 AK3.01	Q #61 – Emergency Plan implementation is considered SRO level knowledge. Randomly reselected 060 AK3.02.
1 / 2	059 AA2.04	Q #82 – Coverage of radioactive releases deemed adequate per Questions #61, #91, and #98. Reselected 036 AA2.02 to address exam content of 10CFR 55.43(7).
2 / 1	059 A2.12	Q #18 – Unable to develop a psychometrically sound question that discriminates at the RO license level. Reselected 059 A1.07 for skyscraper balance.
2 / 1	004 K5.29	Q #03 – Unable to develop a psychometrically sound question that discriminates at the RO license level. Reselected 004 K5.04.
2 / 1	064 K3.01	Q #24 – Unable to develop a psychometrically sound question that discriminates at the RO license level. No automatic loader information available to the operator. Reselected 064 K3.03.
2 / 2	072 K3.02	Q #34 – This specific K/A already covered by Q #60. Reselected 072 G 2.1.27 for skyscraper balance.
3 / 2	G 2.2.25	Q #70 – Assigned K/A G 2.2.2 as it is a better fit for the question and avoids issues with Technical Specification Bases for Reactor Operators.
1 / 1	EO2 G 2.2.3	Q #39 – Substituted K/A G 2.1.31 as the Unit 3 Steam Generator replacement will be underway and negate identified differences between Units.

Tier / Group	Randomly Selected K/A	Reason for Rejection
1 / 1	EO6 EA1.2	Q #49 – Reselected E06 EK2.1 for skyscraper balance.
2 / 1	003 K1.12	Q #01 – This specific K/A already covered by scenario malfunctions. Reselected 003 K1.03.
2 / 1	006 K6.05	Q #06 – Multiple interpretations as to meaning of selected K/A. Assigned a more appropriate K/A to this new question. Selected 006 K6.03.
2 / 1	026 A2.05	Q #15 – Unable to develop a psychometrically sound question that discriminates at the RO license level since there are no Chemical Injection Tanks associated with the Containment Spray System. Reselected 026 A2.02.
1 / 1	008 AA1.05	Q #40 – Unable to develop a psychometrically sound question that discriminates at the RO license level. Reselected 008 AA1.08.
1 / 1	058 AA1.01	Q #52 – Unable to develop a psychometrically sound question that discriminates at the RO license level. Reselected 058 AA1.03.
1 / 2	067 AA1.09	Q #65 – Unable to develop a psychometrically sound question that discriminates at the RO license level. Fire Computer is frequently OOS in the Control Room because this function is performed by the Site Fire Brigade. Reselected 067 AK1.02.
1 / 2	003 AK1.07	Q #62 – Unable to develop a psychometrically sound question that discriminates at the RO license level. Reselected 003 AK1.04.
2 / 1	005 A4.01	Q #04 – This specific K/A already covered by JPM S-4. Reselected 005 A4.02.
2 / 1	010 G2.4.9	Q #15 – Unable to develop a psychometrically sound question that discriminates at the RO license. Reselected 012 K6.06 for skyscraper balance.
3 / 4	G2.4.18	Q #75 – Assigned a more appropriate K/A to this question. Selected G2.4.11.
2 / 1	022 K3.02	Q #14 – Assigned a more appropriate K/A to this new question. Selected G2.1.7.
1 / 1	022 G2.4.2	Q #45 – Assigned a more appropriate K/A to this Cycle 16 Plant Modification. Selected G2.1.19.

Facility: SONGS 2 & 3		Date of Examination: 10/18/10
Examination Level: Reactor Operator		Operating Test Number: NRC
Administrative Topic (see Note)	Type Code*	Describe Activity to be Performed
Conduct of Operations	M, R	2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc. (3.9). JPM: Determine Boration required to Cooldown to MODE 5. (J169A)
Conduct of Operations	N, S	2.1.19 Ability to use plant computers to evaluate system or component status (3.9). JPM: Remove a Nuisance Radiation Monitor From Scan on DAS. (New)
Equipment Control	N, S	2.2.12 Knowledge of surveillance procedures (3.7). JPM: Perform QSPDS Administrative Channel Checks. (New)
Radiation Control	M, R	2.3.7 Ability to comply with radiation work permit requirements during normal or abnormal conditions (3.5). JPM: Determine Stay Times / Respond to changing radiological conditions. (J216A)
Emergency Plan	-	
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		
*Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank ( $\leq 3$ for ROs; $\leq 4$ for SROs & RO retakes) (N)ew or (M)odified from bank ( $\geq 1$ ) (P)revious 2 exams ( $\leq 1$ ; randomly selected)		



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## Administrative Topics Outline

### Task Summary

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- RA1 The applicant will determine the target Boron Concentration required to cool the plant down to MODE 5 per SO23-5-1.5, Plant Shutdown from Hot Standby to Cold Shutdown. The critical steps include determination of the proper value of boron concentration and the required amount to borate using Operations Boration / Dilution Charts. This is a modified bank JPM.
- RA2 The applicant will remove a Radiation Monitor causing nuisance alarms from Scan on the Data Acquisition System per SO23-3-2.36, Radiation Monitor Data Acquisition System, Section 6.4, Bypassing and Restoring RTP Chassis Monitor Alarms. The critical steps include proper monitor selection and removing the Radiation Monitor alarm from Scan. This is a new JPM.
- RA3 The applicant will perform the administrative CHANNEL CHECKS for the Qualified Safety Parameter Display System per SO23-3-2.35, Qualified Safety Parameter Display System, Attachment 3, QSPDS Administrative Channel Checks. The critical steps include collecting data and determining whether each parameter is within tolerance per the Acceptance Criteria. This is a new JPM.
- RA4 The applicant will review a Radiation Entry Permit, select a Survey Map, and determine stay times while hanging a Clearance per SO123-VII-20.9, Radiological Surveys. The critical steps include selecting the appropriate Survey Map and calculating stay time based on the allowable External Dose Equivalent. This is a modified bank JPM.

Facility: SONGS 2 & 3		Date of Examination: 10/18/10
Examination Level: Senior Reactor Operator		Operating Test Number: NRC
Administrative Topic (see Note)	Type Code*	Describe Activity to be Performed
Conduct of Operations	M, R	2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation (4.4).  JPM: Perform DNBR Margin Limit Verification. (J271A)
Conduct of Operations	M, R	2.1.25 Ability to interpret reference materials such as graphs, curves, tables, etc. (4.2).  JPM: Perform Monthly Surveillance to Update Power Maneuvering Guidelines. (J255A)
Equipment Control	N, S	2.2.37 Ability to determine operability and/or availability of safety related equipment (4.6).  JPM: Evaluate Reactor Trip Breaker Operability. (New)
Radiation Control	N, R	2.3.15 Knowledge of radiation monitoring systems, such as fixed radiation monitors and  alarms, portable survey instruments, personnel monitoring equipment, etc. (3.1)  JPM: Determine Change in Steam Generator Tube Leakage. (New)
Emergency Plan	M, S	2.4.38 Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required (4.4).  JPM: Perform Actions for an Aircraft Attack Security Event. (J281A)
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		

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## Administrative Topics Outline

### Task Summary

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\*Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom  
(D)irect from bank ( $\leq 3$  for ROs;  $\leq 4$  for SROs & RO retakes)  
(N)ew or (M)odified from bank ( $\geq 1$ )  
(P)revious 2 exams ( $\leq 1$ ; randomly selected)

- SA1 The applicant will perform a Departure from Nucleate Boiling Ratio Margin Limit verification per SO23-3-3.06, COLSS Out of Service Surveillance. The critical steps include properly identifying the margins and determining if the margin Acceptance Criteria is met. This is a modified bank JPM.
- SA2 The applicant will perform the monthly surveillance to update the Power Maneuvering Guidelines per SO23-5-1.7, Power Operations. The critical steps include correctly determining each boration requirement within specified tolerances and correctly updating the Operating Thumbrules. This is a modified bank JPM.
- SA3 The applicant will evaluate the operability of a Reactor Trip Breaker and perform actions required based on the evaluation per SO23-3-3.5, CEA / Reactor Trip Circuit Breaker OPERABILITY Testing, Attachment 3, Reactor Trip Circuit Breaker Monthly Test - MODES 1 and 2. The critical steps include properly identifying OPERABILITY and determining affected Technical Specifications when the surveillance fails to meet Acceptance Criteria. This is a new JPM.
- SA4 The applicant will determine the change in leakrate during a Steam Generator Tube Leak based on the change in  $\mu\text{ci/sec}$  as read on RE-7870, Condenser Air Ejector Wide Range Gas Monitor. The critical steps include calculating the change in leakrate based on RE-7870, per SO23-13-14, Reactor Coolant Leak, Attachment 1, RE-7870 Steam Generator Radiation and Leakage Readings, and determining the required action per SO23-13-14, Step 4s. This is a new JPM.
- SA5 The applicant will perform an NRC notification and other actions for an aircraft attack per SO23-13-25, Operator Actions During Security Events, Attachment 5, Aircraft Attack Threat. The critical steps include notifying the NRC and initiating a train of Toxic Gas Isolation Signal (TGIS). This is a modified bank JPM.

Facility:	SONGS Units 2 and 3		Date of Examination:	10/18/10
Exam Level:	RO <input type="checkbox"/> SRO(I) <input type="checkbox"/> <b>SRO (U) <input checked="" type="checkbox"/></b>		Operating Test No.:	NRC
Control Room Systems® (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U, including 1 ESF)				
	System / JPM Title	Type Code*	Safety Function	
S-1	001 – Control Rod Drive System (J080FS) Perform an Individual Control Rod Exercise	A, M, S	1	
<b>S-2</b>	<b>013 – Engineered Safety Feature Actuation System (J069S)</b> <b>Reset a SIAS and CCAS</b>	<b>D, EN, S</b>	<b>2</b>	
S-3	010 – Pressurizer Pressure Control System (J254FS) Respond to an Open Pressurizer Spray Valve	A, D, S	3	
<b>S-4</b>	<b>005 – Residual Heat Removal System (J152FS)</b> <b>Perform Actions for Loss of Shutdown Cooling</b>	<b>A, D, L, S</b>	<b>4P</b>	
S-5	059 – Main Feedwater System (J034S) (RO Only) Transfer from Main Feedwater to Auxiliary Feedwater	M, S	4S	
S-6	064 – Emergency Diesel Generators (J286S) Parallel Isochronous EDG with Reserve Auxiliary Transformer	D, S	6	
<b>S-7</b>	<b>016 – Non-Nuclear Instrumentation System (New)</b> <b>Respond to Loss of Turbine DCS Control Panels</b>	<b>A, N, S</b>	<b>7</b>	
S-8	029 – Containment Purge System (New) Respond to a Refueling Accident in Containment	A, EN, N, S	8	
In-Plant Systems® (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)				
<b>P-1</b>	<b>033 – Spent Fuel Pool Cooling System (New)</b> <b>Align Spent Fuel Pool Makeup from the RWST</b>	<b>E, N, R</b>	<b>8</b>	
<b>P-2</b>	<b>039 – Main and Reheat Steam Systems (J022)</b> <b>Restore Atmospheric Dump Valve to Remote Operation</b>	<b>D</b>	<b>4S</b>	
P-3	004 – Chemical and Volume Control System (J064) Locally Close a Charging Pump Breaker	D, E	2	

@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.	
* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	$\leq 9 / \leq 8 / \leq 4$
(E)mergency or abnormal in-plant	$\geq 1 / \geq 1 / \geq 1$
(EN)gineered safety feature	- / - / $\geq 1$ (control room system)
(L)ow Power / Shutdown	$\geq 1 / \geq 1 / \geq 1$
(N)ew or (M)odified from bank including 1(A)	$\geq 2 / \geq 2 / \geq 1$
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$ (randomly selected)
(R)CA	$\geq 1 / \geq 1 / \geq 1$
(S)imulator	

#### NRC JPM Examination Summary Description

- S-1 The applicant will exercise an individual Control Element Assembly (CEA) after I&C Maintenance per SO23-3-2.19, Control Element Drive Mechanism Control System. The alternate path occurs when two (2) CEAs drop into the Core requiring the actions of SO23-13-13, Misaligned or Immovable Control Element Assembly. This is a time critical, modified bank JPM under the Control Rod Drive System - Reactivity Control Safety Function. This is a PRA significant action.
- S-2 The applicant will perform a reset of the Safety Injection Actuation Signal (SIAS) and Containment Cooling Actuation Signal (CCAS) per SO23-3-2.22, Engineered Safety Features Actuation System Operation, Attachment 5, SIAS / CCAS and CIAS Reset. This is a bank JPM under the Engineered Safety Features Actuation System – Reactor Coolant System Inventory Control Safety Function.
- S-3 The applicant will respond to an open Pressurizer Spray Valve per SO23-13-27, Pressurizer Pressure and Level Malfuction. The alternate path includes tripping the Reactor and associated Reactor Coolant Pumps for the affected Pressurizer Spray Valve, when it is determined that the Spray Valve will not close. This is a bank JPM under the Pressurizer Pressure and Level Control System - Reactor Pressure Control Safety Function. This is a PRA significant action.
- S-4 The applicant will perform the actions for a Loss of Shutdown Cooling (SDC) per SO23-13-15, Loss of Shutdown Cooling, during a Loss of Offsite Power while in a Reduced Inventory Condition. The alternate path occurs when the SDC Pump starts to cavitate and actions must be taken to refill the Reactor Coolant System using High Pressure Safety Injection. This is a bank JPM under the Residual Heat Removal System - Heat Removal from Reactor Core Safety Function. This is a PRA significant action.

- S-5 The applicant will shift from the Main Feedwater System to the Auxiliary Feedwater System during a plant shutdown per SO23-9-6, Feedwater Control System Operation, Attachment 6, Feedwater Control System Operation - Unit Shutdown. This is a modified bank JPM under the Main Feedwater System - Secondary System Heat Removal from the Reactor Core Safety Function.
- S-6 The applicant will synchronize the Emergency Diesel Generator operating in the Isochronous Mode with the Reserve Auxiliary Transformer per SO23-02-13, Diesel Generator Operation, Attachment 2, Section 2.6, Paralleling a Diesel Supplied Isochronous Bus to the RAT, and Section 2.8, Unloading the Diesel Generator. This is a bank JPM under the Emergency Diesel Generator System - Electrical Safety Function.
- S-7 The applicant will be directed to reduce Turbine load per SO23-5-1.7, Power Operations, Section 6.3, Turbine Load Change Using Setpoint Adjustment. The alternate path occurs when power to both Turbine DCS Control Panels and the Ovation Keyboard is lost requiring action to place an alternate control screen in service and stop the Turbine load change. This is a new JPM under the Non-Nuclear Instrumentation System - Instrumentation Safety Function.
- S-8 The applicant will respond to a Fuel Handling Accident in Containment during MODE 6 operations per SO23-13-20, Fuel Handling Accidents. The alternate path occurs when the Containment Purge System fails to isolate and must be manually isolated per SO23-3-2.22, Engineered Safety Features Actuation System Operation, Attachment 20, CPIS Actuation Verification. This is a new JPM under the Containment Purge System - Plant Service System Safety Function.
- P-1 The applicant will respond to a loss of Spent Fuel Pool inventory per SO23-13-23, Loss of Spent Fuel Pool Cooling, by locally aligning makeup from the Refueling Water Storage Tank per SO23-3-2.11.1, Spent Fuel Pool Level Change and Purification Crosstie Operations, Attachment 3, SFP Makeup Using the RWST and SFP Pump P-009. This is a new JPM under the Spent Fuel Pool Cooling System - Plant Service System Safety Function.
- P-2 The applicant will restore remote operation of a Unit 2 Atmospheric Dump Valve per SO23-3-2.18.1, Atmospheric Dump Valve Operation, Attachment 4, Local Manual Operation of HV-8419 Atmospheric Dump Valve, Section 2.2, Restoration from HV-8419 Local Manual Operation or Attachment 5, Local Manual Operation of HV-8421 Atmospheric Dump Valve, Section 2.2, Restoration from HV-8421 Local Manual Operation. This is a bank JPM under the Main and Reheat Steam System - Secondary System Heat Removal from Reactor Core Safety Function.
- P-3 The applicant will locally close a Charging Pump Breaker per SO23-13-2, Shutdown From Outside the Control Room, Attachment 21, Circuit Breaker Abnormal Operation. This is a bank JPM under the Chemical and Volume Control System - Reactor Coolant Inventory Control Safety Function. This is a PRA significant action.

Facility: SONGS 2 and 3		Date of Exam: 10/18/10		Operating Test Number: 1													
A P P L I C A N T	E V E N T  T Y P E	SCENARIOS															
		SONGS #1			SONGS #2			SONGS #4						T O T A L	MINIMUM(*)		
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P		S R O	A T C	B O P
SROU-1	RX	-	-	-	-	-	-	-	-	-				0	1	1	0
	NOR	4	-	-	-	-	-	-	-	-				1	1	1	1
	I/C	1,2,3,5	-	-	1,2,3,4,5	-	-	-	-	-				9	4	4	2
	MAJ	6	-	-	6,8	-	-	-	-	-				3	2	2	1
	TS	1,5	-	-	1,2	-	-	-	-	-				4	0	2	2
SROI-1	RX	-	-	-	-	-	-	-	-	-				0	1	1	0
	NOR	4	-	-	-	-	-	-	-	1,5				3	1	1	1
	I/C	1,2,3,5	-	-	-	1,2,4,5,9	-	-	-	8				10	4	4	2
	MAJ	6	-	-	-	6,8	-	-	-	6				4	2	2	1
	TS	1,5	-	-	-	-	-	-	-	-				2	0	2	2
SROI-2	RX	-	4	-	-	-	-	-	-	-				1	1	1	0
	NOR	-	-	-	-	-	-	5	-	-				1	1	1	1
	I/C	-	2,5	-	1,2,3,4,5	-	-	2,3,4	-	-				10	4	4	2
	MAJ	-	6	-	6,8	-	-	6	-	-				4	2	2	1
	TS	-	-	-	1,2	-	-	2,3	-	-				4	0	2	2
SROI-3	RX	-	-	-	-	-	-	-	-	-				0	1	1	0
	NOR	4	-	-	-	-	-	-	-	1,5				3	1	1	1
	I/C	1,2,3,5	-	-	-	1,2,4,5,9	-	-	-	8				10	4	4	2
	MAJ	6	-	-	-	6,8	-	-	-	6				4	2	2	1
	TS	1,5	-	-	-	-	-	-	-	-				2	0	2	2
SROI-4	RX	-	4	-	-	-	-	-	-	-				1	1	1	0
	NOR	-	-	-	-	-	-	5	-	-				1	1	1	1
	I/C	-	2,5	-	1,2,3,4,5	-	-	2,3,4	-	-				10	4	4	2
	MAJ	-	6	-	6,8	-	-	6	-	-				4	2	2	1
	TS	-	-	-	1,2	-	-	2,3	-	-				4	0	2	2
RO-1	RX	-	4	-	-	-	-	-	-	-				1	1	1	0
	NOR	-	-	-	-	-	-	-	-	-				0	1	1	1
	I/C	-	2,5	-	-	-	1,3,7	-	-	-				5	4	4	2
	MAJ	-	6	-	-	-	6,8	-	-	-				3	2	2	1
	TS	-	-	-	-	-	-	-	-	-				0	0	2	2
RO-2	RX	-	-	-	-	-	-	-	5	-				1	1	1	0
	NOR	-	-	4	-	-	-	-	-	-				1	1	1	1
	I/C	-	-	1,8,9	-	-	1,3,7	-	2,4,7	-				9	4	4	2
	MAJ	-	-	6	-	-	6,8	-	6	-				4	2	2	1
	TS	-	-	-	-	-	-	-	-	-				0	0	2	2

A P P L I C A N T	E V E N T  T Y P E	SCENARIOS															
		SONGS #1			SONGS #2			SONGS #4						T O T A L	MINIMUM(*)		
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION				R	I	U
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P				
RO-3	RX	-	-	-	-	-	-	-	5	-				1	1	1	0
	NOR	-	-	4	-	-	-	-	-	-				1	1	1	1
	I/C	-	-	1,8,9	-	-	1,3,7	-	2,4,7	-				9	4	4	2
	MAJ	-	-	6	-	-	6,8	-	6	-				4	2	2	1
	TS	-	-	-	-	-	-	-	-	-				0	0	2	2
RO-4	RX	-	4	-	-	-	-	-	-	-				1	1	1	0
	NOR	-	-	-	-	-	-	-	-	-				0	1	1	1
	I/C	-	2,5	-	-	-	1,3,7	-	-	-				5	4	4	2
	MAJ	-	6	-	-	-	6,8	-	-	-				3	2	2	1
	TS	-	-	-	-	-	-	-	-	-				0	0	2	2
RO-5	RX	-	-	-	-	-	-	-	-	-				0	1	1	0
	NOR	-	-	4	-	-	-	-	-	-				1	1	1	1
	I/C	-	-	1,8,9	-	1,2,4, 5,9	-	-	-	-				8	4	4	2
	MAJ	-	-	6	-	6,8	-	-	-	-				3	2	2	1
	TS	-	-	-	-	-	-	-	-	-				0	0	2	2
RO-6	RX	-	-	-	-	-	-	-	-	-				0	1	1	0
	NOR	-	-	4	-	-	-	-	-	-				1	1	1	1
	I/C	-	-	1,8,9	-	1,2,4, 5,9	-	-	-	-				8	4	4	2
	MAJ	-	-	6	-	6,8	-	-	-	-				3	2	2	1
	TS	-	-	-	-	-	-	-	-	-				0	0	2	2

## Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (\*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.



Operating Test :	NRC	Scenario #	1	Event #	6, 7, 8, & 9	Page	1	of	1
Event Description: Steam Line Break Inside Containment / Loss of Offsite Power / Loss of SDG&E Switchyard / Train B EDG Breaker Failure / Main Steam Isolation Signal Actuation Failure									
Time	Position	Applicant's Actions or Behavior							

Facility:	SONGS 2 and 3		Scenario No.:	1	Op Test No.:	October 2010 NRC
Examiners:			Operators:			
Initial Conditions: <ul style="list-style-type: none"> <li>100% power MOC - RCS Boron is 989 ppm (by sample)</li> <li>Train A Component Cooling Water Pump (P-025) in service.</li> <li>Charging Pump (P-191) aligned to 480 Volt Bus 2B04.</li> <li>Channel X Pressurizer Pressure and Level in service.</li> <li>Boric Acid Makeup Pump (P-174) OOS for seal replacement.</li> </ul>						
Turnover:	Maintain steady-state power level.					
Critical Tasks:	<ul style="list-style-type: none"> <li>Stabilize Temperature Following Loss of Heat Removal from Faulted Steam Generator.</li> <li>Isolate the Faulted Steam Generator During Excess Steam Demand Event.</li> </ul>					
Event No.	Malf. No.	Event Type*	Event Description			
1 +10 min	SG03G	I (BOP, CRS) TS (CRS)	Steam Generator (E-089) Pressure Transmitter (PT-1013-3) Fails Low.			
2 +20 min	RC15A	I (RO, CRS)	Pressurizer Pressure Control Channel X (PT-0100X) Fails High.			
3 +25 min	CW05A		Circulating Water Pump (P-115) Overcurrent Trip.			
4 +50 min		R (RO) N (BOP, CRS)	Rapid Power Reduction to 85% due to Loss of Circulating Water Pump (P-115) per Direction of Shift Manager.			
5 +55 min	CV17B	C (RO, CRS) TS (CRS)	Boric Acid Makeup Pump (P-175) Trips During Boration.			
6 +60 min	MS03B	M (RO, BOP, CRS)	Steam Generator (E-089) Main Steam Line Break Inside Containment.			
7 +60 min	PG24 PG57		Loss of Offsite Power (30 second time delay) Post Trip. Loss of SDG&E Switchyard Post Trip (60 second time delay).			
8 +60 min	EG16B	C (BOP)	Train B Emergency Diesel Generator (2G003) Breaker Fails to Automatically Close.			
9 +65 min	MSIS LP	I (BOP)	Main Steam Isolation Signal Fails to Automatically Actuate.			
* (N)ormal (R)eactivity (I)nstrument (C)omponent (M)ajor (TS)Technical Specifications						

Operating Test :	NRC	Scenario #	2	Event #	6, 7, 8, & 9	Page	1	of	1
Event Description: Steam Line Break Outside Containment / Reactor Coolant System Leak / Fuel Failure / Turbine Trip Failure / Containment Spray Pump Start Failure									
Time	Position	Applicant's Actions or Behavior							

Facility:	SONGS 2 and 3		Scenario No.:	2	Op Test No.:	October 2010 NRC	
Examiners:			Operators:				
<p>Initial Conditions:</p> <ul style="list-style-type: none"> <li>70% power MOC - RCS Boron is 1070 ppm (by sample).</li> <li>Train A Component Cooling Water Pump (P-025) in service.</li> <li>Charging Pump (P-192) running with (P-191) aligned to 480 Volt Bus 2B04.</li> <li>Train A Auxiliary Feedwater Pump (P-141) OOS for oil change.</li> <li>Channel X Pressurizer Pressure and Level in service.</li> </ul>							
Turnover:	Maintain steady-state conditions following return of Main Feedwater Pump to service.						
Critical Tasks:	<ul style="list-style-type: none"> <li>Restore Component Cooling Water Flow due to Loss of CCW Pump.</li> <li>Manually Trip Reactor Due to Reactor Protection System Failure.</li> <li>Isolate the Faulted Steam Generator During Excess Steam Demand Event.</li> </ul>						
Event No.	Malf. No.	Event Type*	Event Description				
1 +15 min	RC17B	I (RO, BOP, CRS) TS (CRS)	Pressurizer Pressure Wide Range Transmitter (PT-0102-2) Fails Low.				
2 +25 min	CV22C	C (RO, CRS) TS (CRS)	Charging Pump (P-192) Overcurrent Trip.				
3 +30 min	CC06B	C (BOP, CRS)	Train A Component Cooling Water Pump (P-025) Trip.				
4 +32 min	OBE with RC07A	C (RO, CRS)	Seismic Event with Reactor Coolant Pump (P-001) Seized Shaft (60 second time delay).				
5 +32 min	RP15	I (RO)	Reactor Fails to Automatically Trip.				
6 +35 min	MS05A	M (RO, BOP, CRS)	Steam Generator (E-088) Main Steam Leak Upstream of Main Steam Isolation Valve.				
7 +35 min	TU07	I (BOP)	Turbine Trip Failure on Reactor Trip.				
8 +35 min	RC03 RC19	M (RO, BOP, CRS)	Reactor Coolant System Leakage at 500 GPM. Failed Fuel due to RCP Seized Shaft Exceeding DNBR & LPD.				
9 +40 min	RP01M	C (RO)	Containment Spray Pump (P-012) Auto Start Failure.				
* (N)ormal (R)eactivity (I)nstrument (C)omponent (M)ajor (TS)Technical Specifications							

Operating Test :	NRC	Scenario #	3	Event #	6 & 7	Page	1	of	1
Event Description: Two Stuck Control Element Assemblies / Auxiliary Feedwater Pump EFAS Start Failures									
Time	Position	Applicant's Actions or Behavior							

Facility:	SONGS 2 and 3		Scenario No.:	3	Op Test No.:	October 2010 NRC	
Examiners:	_____		Operators:	_____			
	_____			_____			
	_____			_____			
Initial Conditions: <ul style="list-style-type: none"> <li>1.5% power MOC - RCS Boron is 1415 ppm (by sample).</li> <li>Train A Component Cooling Water Pump (P-025) in service.</li> <li>Channel Y Pressurizer Pressure and Level in service.</li> <li>Steam Bypass Control System in operation.</li> </ul>							
Turnover: Secure Auxiliary Feedwater System and Raise Power to 18%.							
Critical Tasks: <ul style="list-style-type: none"> <li>Trip Any Reactor Coolant Pump Not Satisfying Operating Limits.</li> <li>Initiate Emergency Boration for Two (2) Stuck Control Element Assemblies.</li> </ul>							
Event No.	Malf. No.	Event Type*	Event Description				
1 +15 min		N (BOP)	Place Auxiliary Feedwater System in Standby.				
2 +30 min		R (RO) N (BOP, CRS)	Power increase to 18% power.				
3 +40 min	CH03A	TS (CRS)	Containment Pressure Transmitter (PT-0351-1) Fails High.				
4 +70 min	ED07B	C (RO, BOP, CRS) TS (CRS)	Loss of Vital AC Instrument Bus (Y-02).				
5 +72 min	RP23B	M (RO, BOP, CRS)	Train A & B Inadvertent Containment Isolation Actuation Signal (CIAS) Actuation.				
6 +72 min	RD0102 RD0202	C (RO)	Two (2) Stuck CEAs (#1 & #2) upon Reactor Trip. Emergency Boration Required.				
7 +78 min	RP01O RP01P	C (BOP)	Auxiliary Feedwater Pumps (P-141 & P-504) Fail to Start on Emergency Feedwater Actuation Signal.				
* (N)ormal (R)eactivity (I)nstrument (C)omponent (M)ajor (TS)Technical Specifications							

Operating Test :	NRC	Scenario #	4	Event #	6, 7, & 8	Page	1	of	1
Event Description: Steam Generator Tube Rupture / Anticipated Transient without Scram / Non-1E Bus Failure									
Time	Position	Applicant's Actions or Behavior							

Facility:	SONGS 2 and 3		Scenario No.:	4	Op Test No.:	October 2010 NRC	
Examiners:	_____		Operators:	_____			
	_____			_____			
	_____			_____			
Initial Conditions:	<ul style="list-style-type: none"> <li>70% power MOC - RCS Boron is 1070 ppm (by sample).</li> <li>Train A Component Cooling Water Pump (P-025) in service.</li> <li>Charging Pump (P-191) aligned to 480 Volt Bus 2B04.</li> <li>Train A Auxiliary Feedwater Pump (P-141) OOS for oil change.</li> <li>Channel X Pressurizer Pressure and Level in service.</li> </ul>						
Turnover:	Transfer Reactor Coolant Pump (RCP) 6900 V Bus 2A01 from UAT to RAT.						
Critical Tasks:	<ul style="list-style-type: none"> <li>Manually Trip the Reactor due to Reactor Protection System Failure.</li> <li>Reduce Reactor Coolant System T<sub>HOT</sub> to less than 530°F.</li> <li>Isolate the Ruptured Steam Generator.</li> </ul>						
Event No.	Malf. No.	Event Type*	Event Description				
1 +10 min		N (BOP)	Transfer Reactor Coolant Pump 6900 Volt Bus 2A01 from Unit Auxiliary Transformer to Reserve Auxiliary Transformer.				
2 +20 min	RC16A	I (RO, CRS) TS (CRS)	Pressurizer Level Control Channel X (LT-0110-1) Fails High.				
3 +30 min	CS05B	TS (CRS)	Refueling Water Storage Tank Level Transmitter (LT-0305-2) Fails Low.				
4 +35 min	SG01A	C (RO, CRS)	Steam Generator (E-088) Tube Leak Greater Than 150 GPD.				
5 +50 min		R (RO) N (BOP, CRS)	Rapid Power Reduction for Steam Generator (E-088) Tube Leak.				
6 +55 min	SG01A	M (RO, BOP, CRS)	Steam Generator (E-088) Tube Rupture at 300 GPM (5 minute ramp).				
7 +55 min	RP02A RP02B	I (RO)	All Reactor Trip Pushbuttons Disabled / Anticipated Transient without Scram.				
8 +60 min	2A03 LP	C (BOP)	Non-1E 4160 Volt Bus 2A03 Fails to Auto Transfer on Reactor Trip.				
* (N)ormal (R)eactivity (I)nstrument (C)omponent (M)ajor (TS)Technical Specifications							