Facility: San Onofre Date of Exam: 12 December 2003 Exam Level: RO

Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	3	3	3				3	2			2	16
	2	3	3	3				3	3			2	17
	3	0	0	1				1	0			1	3
	Tier Totals	6	6	7				7	5			5	36
2. Plant Systems	1	2	2	2	3	2	1	2	2	3	2	2	23
	2	3	2	2	1	2	1	2	2	2	1	2	20
	3	0	1	1	1	1	1	1	1	1	0	0	8
	Tier Totals	5	5	5	4	6	3	5	5	6	3	4	51
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		13
					4		3		3		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 Form ES-401-4 (R8, S1)

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000005 Inoperable/Stuck Control Rod / 1			1				AK3.05	3.9	1
000015/17 RCP Malfunctions / 4						1	2.1.28	3.2	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4									0
000024 Emergency Boration / 1	1						AK1.02	3.6	1
000026 Loss of Component Cooling Water / 8			1				AK3.03	4.0	1
000027 Pressurizer Pressure Control System Malfunction / 3	1						AK1.02	2.8	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4									0
CE/A11; W/E08 RCS Overcooling - PTS / 4		1					EK2.2	3.6	1
000051 Loss of Condenser Vacuum / 4					1		AA2.02	3.9	1
000055 Station Blackout / 6				1			EA1.07	4.3	1
000057 Loss of Vital AC Elec. Inst. Bus / 6					1		AA2.19	4.0	1
000062 Loss of Nuclear Service Water / 4				1			AA1.02	3.2	1
000067 Plant Fire On-site / 9				1			AA1.08	3.4	1
000068 (BW/A06) Control Room Evac. / 8		1					AK2.02	3.7	1
000069 (W/E14) Loss of CTMT Integrity / 5	1						AK1.01	2.6	1
000074 (W/E06&E07) Inad. Core Cooling / 4			1				EK3.11	4.0	1
BW/E03 Inadequate Subcooling Margin / 4		1					EK2.1	3.6	1
000076 High Reactor Coolant Activity / 9	1						2.1.32	3.4	1
BW/A02&A03 Loss of NNI-X/Y / 7									0
K/A Category Totals:	3	3	3	3	2	2	Group Point Total:		16

ES-401 PWR RO Examination Outline Form ES-401-4 (R8, S1)

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1						1	2.2.25		1
000003 Dropped Control Rod / 1				1			AA1.06		1
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1	1						EK1.2		1
BW/A01 Plant Runback / 1									0
BW/A04 Turbine Trip / 4									0
000008 Pressurizer Vapor Space Accident / 3		1					AK2.02		1
000009 Small Break LOCA / 3			1				EK3.26		1
000011 Large Break LOCA / 3									0
W/E04 LOCA Outside Containment / 3					1		EA2.1		1
BW/E08; W/E03 LOCA Cooldown/Depress. / 4			1				EK3.3		1
W/E11 Loss of Emergency Coolant Recirc. / 4		1					EK2.2		1
W/EO1 & E02 Rediagnosis & SI Termination / 3	1						EK1.1		1
000022 Loss of Reactor Coolant Makeup / 2			1				AK3.06		1
000025 Loss of RHR System / 4					1		AA2.02		1
000029 Anticipated Transient w/o Scram / 1				1			EA1.08		1
000032 Loss of Source Range NI / 7	1						AK1.01		1
000033 Loss of Intermediate Range NI / 7		1					AA2.07		1
000037 Steam Generator Tube Leak / 3									0
000038 Steam Generator Tube Rupture / 3					1		EA1.01		1
000054 (CE/E06) Loss of Main Feedwater / 4									0
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4						1	2.4.14		1
000058 Loss of DC Power / 6				1			AA2.03		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:	3	2	3	3	4	2	Group Point Total:		17

ES-401 PWR RO Examination Outline Form ES-401-4 (R8, S1)

Emergency and Abnormal Plant Evolutions - Tier 1/Group 3

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			1				AK3.02		1
000065 Loss of Instrument Air / 8									0
BW/E13&E14 EOP Rules and Enclosures									0
BW/A05 Emergency Diesel Actuation / 6									0
BW/A07 Flooding / 8									0
CE/A16 Excess RCS Leakage / 2									0
W/E13 Steam Generator Over-pressure / 4						1	2.4.47		1
W/E15 Containment Flooding / 5				1			EA1.3		1
K/A Category Point Totals:	0	0	1	1	0	1	Group Point Total:		3

ES-401 PWR RO Examination Outline Form ES-401-4 (R8, S1)

Plant Systems - Tier 2/Group 1

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive								1				AA2.03	3.5	1
001 Control Rod Drive									1			AA3.06	3.9	1
003 Reactor Coolant Pump						1						K6.14	2.6	1
003 Reactor Coolant Pump	1											K1.06	3.3	1
004 Chemical and Volume Control		1										K2.03	3.3	1
004 Chemical and Volume Control	1											K1.02	3.5	1
013 Engineered Safety Features Actuation							1					A1.03	2.6	1
013 Engineered Safety Features Actuation									1			A3.02	4.1	1
015 Nuclear Instrumentation									1			A3.03	3.9	1
015 Nuclear Instrumentation											1	2.2.2	4.0	1
017 In-core Temperature Monitor										1		A4.01	3.8	1
017 In-core Temperature Monitor			1									K3.01	3.5	1
022 Containment Cooling										1		A4.05	3.8	1
022 Containment Cooling							1					A1.02	3.6	1
025 Ice Condenser														0
056 Condensate														0
059 Main Feedwater											1	2.4.4	4.0	1
059 Main Feedwater								1				A2.12	3.1	1
061 Auxiliary/Emergency Feedwater				1								K4.06	4.0	1
061 Auxiliary/Emergency Feedwater		1										K2.02	3.7	1
068 Liquid Radwaste					1							K5.04	3.2	1
071 Waste Gas Disposal			1									K5.04	2.7	1
071 Waste Gas Disposal					1							K3.04	2.5	1
072 Area Radiation Monitoring				1								K4.03	2.5	1
072 Area Radiation Monitoring				1								K5.02	3.2	1
K/A Category Point Totals:	2	2	2	3	2	1	2	2	3	2	2	Group Point Total:		23

ES-401 PWR RO Examination Outline Form ES-401-4 (R8, S1)

Plant Systems - Tier 2/Group 2

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant	1											K1.08	4.5	1
006 Emergency Core Cooling						1						K6.03	3.6	1
010 Pressurizer Pressure Control				1								K4.03	3.8	1
011 Pressurizer Level Control									1			A3.02	2.6	1
012 Reactor Protection			1									K3.02	3.2	1
014 Rod Position Indication					1							K5.04	4.3	1
016 Non-nuclear Instrumentation								1				A2.03	3.0	1
026 Containment Spray									1			A3.01	4.3	1
029 Containment Purge			1									K3.02	2.9	1
033 Spent Fuel Pool Cooling							1					A1.02	2.8	1
035 Steam Generator	1											K1.01	4.2	1
039 Main and Reheat Steam	1											K1.05	2.5	1
055 Condenser Air Removal			1									K3.01	2.5	1
062 AC Electrical Distribution											1	2.4.16	3.0	1
063 DC Electrical Distribution		1										K2.01	2.9	1
064 Emergency Diesel Generator							1					A1.03	3.2	1
073 Process Radiation Monitoring										1		A4.01	3.9	1
075 Circulating Water		1										K2.03	2.6	1
079 Station Air											1	2.1.27	2.8	1
086 Fire Protection								1				A2.02	3.0	1
K/A Category Point Totals:	3	2	3	1	1	1	2	2	2	1	2	Group Point Total:		20

ES-401 PWR RO Examination Outline Form ES-401-4 (R8, S1)

Plant Systems - Tier 2/Group 3

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal							1					A1.01	3.5	1
007 Pressurizer Relief/Quench Tank														0
008 Component Cooling Water				1								K4.09	2.7	1
027 Containment Iodine Removal		1										K2.01	3.1	1
028 Hydrogen Recombiner and Purge Control														0
034 Fuel Handling Equipment								1				A2.03	3.3	1
041 Steam Dump/Turbine Bypass Control						1						K6.03	2.7	1
045 Main Turbine Generator			1									K3.01	2.9	1
076 Service Water														0
078 Instrument Air	1											K1.05	3.4	1
103 Containment									1			A3.01	3.9	1
K/A Category Point Totals:	1	1	1	1	0	1	1	1	1	0	0	Group Point Total:		8

Plant-Specific Priorities

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

Facility: San Onofre Nuclear Generating Station Date of Exam: 12/11/03 Exam Level: SRO

Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	4	3	4				5	4			4	24
	2	3	2	3				3	3			2	16
	3	0	0	1				1	0			1	3
	Tier Totals	7	5	8				9	7			7	43
2. Plant Systems	1	1	2	1	2	2	1	2	2	3	2	1	19
	2	3	2	2	1	1	1	2	2	1	1	1	17
	3	0	1	1	1	0	0	1	0	0	0	0	4
	Tier Totals	4	5	4	4	3	2	5	4	4	3	2	40
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		
					4		4		4		5		17

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).
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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.
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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 Form ES-401-3 (R8, S1)

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1						1	2.2.25	3.7	1
000003 Dropped Control Rod / 1				1			AA1.06	4.1	1
000005 Inoperable/Stuck Control Rod / 1			1				AK3.05	4.2	1
000011 Large Break LOCA / 3					1		EA2.14	4.0	1
W/E04 LOCA Outside Containment / 3					1		EA2.1	4.2	1
W/EO1 & E02 Rediagnosis & SI Termination / 3	1						EK1.1	3.8	1
000015/17 RCP Malfunctions / 4						1	2.1.28	3.3	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4			1				EK3.4	3.6	1
000024 Emergency Boration / 1	1						AK1.02	3.9	1
000026 Loss of Component Cooling Water / 8			1				AK3.03	4.2	1
000029 Anticipated Transient w/o Scram / 1				1			EA1.08	4.5	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4	1						AK1.07	4.2	1
CE/A11; W/E08 RCS Overcooling - PTS / 4		1					EK2.2	3.1	1
000051 Loss of Condenser Vacuum / 4					1		AA2.02	4.1	1
000055 Station Blackout / 6				1			EA1.07	4.5	1
000057 Loss of Vital AC Elec. Inst. Bus / 6					1		AA2.19	4.3	1
000059 Accidental Liquid RadWaste Rel. / 9						1	2.4.50	3.3	1
000062 Loss of Nuclear Service Water / 4				1			AA1.02	3.3	1
000067 Plant Fire On-site / 9				1			AA1.08	3.7	1
000068 (BW/A06) Control Room Evac. / 8		1					EK2.1	4.0	1
000069 (W/E14) Loss of CTMT Integrity / 5	1						Ak1.01	3.1	1
000074 (W/E06&E07) Inad. Core Cooling / 4			1				EK3.11	4.1	1
BW/E03 Inadequate Subcooling Margin / 4		1					Ek2.1	4.0	1
000076 High Reactor Coolant Activity / 9						1	2.1.32	3.8	1
BW/A02&A03 Loss of NNI-X/Y / 7									
K/A Category Totals:	4	3	4	5	4	4	Group Point Total:		24

ES-401 PWR SRO Examination Outline Form ES-401-3 (R8, S1)

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

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						K1.2	3.9	
BW/A01 Plant Runback / 1									
BW/A04 Turbine Trip / 4									
000008 Pressurizer Vapor Space Accident / 3		1					AK2.02	2.7	
000009 Small Break LOCA / 3			1				EK3.26	4.5	
BW/E08; W/E03 LOCA Cooldown - Depress. / 4			1				EK3.3	3.9	
W/E11 Loss of Emergency Coolant Recirc. / 4		1					EK2.2	4.3	
000022 Loss of Reactor Coolant Makeup / 2			1				AK3.06	3.3	
000025 Loss of RHR System / 4					1		AA2.02	3.8	
000027 Pressurizer Pressure Control System Malfunction / 3	1						AK1.02	3.1	
000032 Loss of Source Range NI / 7	1						AK1.01	3.1	
000033 Loss of Intermediate Range NI / 7					1		AA2.07	4.2	
000037 Steam Generator Tube Leak / 3						1	2.1.7	4.4	
000038 Steam Generator Tube Rupture / 3				1			EA1.01	4.4	
000054 (CE/E06) Loss of Main Feedwater / 4				1			AA1.01	4.4	
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4						1	2.4.14	3.9	
000058 Loss of DC Power / 6					1		AA2.03	3.9	
000060 Accidental Gaseous Radwaste Rel. / 9									
000061 ARM System Alarms / 7									
W/E16 High Containment Radiation / 9									
000065 Loss of Instrument Air / 8				1			AA1.03	3.1	
CE/E09 Functional Recovery									
K/A Category Point Totals:	3	2	3	3	3	2	Group Point Total:		16

ES-401 PWR SRO Examination Outline Form ES-401-3 (R8, S1)

Emergency and Abnormal Plant Evolutions - Tier 1/Group 3

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / 2									
000036 (BW/A08) Fuel Handling Accident / 8									
000056 Loss of Off-site Power / 6			1				AK3.02	4.7	
BW/E13&E14 EOP Rules and Enclosures									
BW/A05 Emergency Diesel Actuation / 6									
BW/A07 Flooding / 8									
CE/A16 Excess RCS Leakage / 2									
W/E13 Steam Generator Over-pressure / 4						1	2.4.47	3.7	
W/E15 Containment Flooding / 5				1			EA1.3	3.0`	
K/A Category Point Totals:	0	0	1	1	0	1	Group Point Total:		3

ES-401 PWR SRO Examination Outline Form ES-401-3 (R8, S1)

Plant Systems - Tier 2/Group 1

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive								1				A2.03	4.2	
003 Reactor Coolant Pump						1						K6.14	2.9	
003 Reactor Coolant Pump	1											K1.03	3.6	
004 Chemical and Volume Control		1										K2.03	3.5	
013 Engineered Safety Features Actuation							1					A1.03	2.6	
013 Engineered Safety Features Actuation									1			A3.02	4.2	
014 Rod Position Indication					1							K5.02	3.3	
015 Nuclear Instrumentation									1			A3.03	3.9	
017 In-core Temperature Monitor										1		A4.01	4.1	
022 Containment Cooling										1		A4.05	3.8	
022 Containment Cooling							1					A1.02	3.8	
025 Ice Condenser														
026 Containment Spray									1			A3.01	4.5	
056 Condensate								1				A2.04	2.8	
059 Main Feedwater											1	2.4.4	4.3	
061 Auxiliary/Emergency Feedwater				1								K4.06	4.2	
063 DC Electrical Distribution		1										K2.01	3.1	
068 Liquid Radwaste					1							K5.04	3.5	
071 Waste Gas Disposal			1									K3.04	2.9	
072 Area Radiation Monitoring				1								K4.03	3.6	
K/A Category Point Totals:	1	2	1	2	2	1	2	2	3	2	1	Group Point Total:		19

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s
002 Reactor Coolant	1											K1.08
006 Emergency Core Cooling						1						K6.03
010 Pressurizer Pressure Control				1								K4.03
011 Pressurizer Level Control									1			A3.02
012 Reactor Protection					1							K5.01
016 Non-nuclear Instrumentation								1				A2.03
027 Containment Iodine Removal		1										K2.01
028 Hydrogen Recombiner and Purge Control												
029 Containment Purge			1									K3.02
033 Spent Fuel Pool Cooling							1					A1.01
034 Fuel Handling Equipment												
035 Steam Generator	1											K1.01
039 Main and Reheat Steam	1											K1.05
055 Condenser Air Removal			1									K3.01
062 AC Electrical Distribution											1	2.4.16
064 Emergency Diesel Generator							1					A1.03
073 Process Radiation Monitoring												A4.01
075 Circulating Water		1										K2.03
079 Station Air												A2.02
086 Fire Protection								1				
103 Containment												
K/A Category Point Totals:	3	2	2	1	1	1	2	2	1	1	1	Group Point Total:

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)
005 Residual Heat Removal							1					A1.01
007 Pressurizer Relief/Quench Tank												
008 Component Cooling Water				1								K4.09
041 Steam Dump/Turbine Bypass Control		1										K2.01
045 Main Turbine Generator			1									K3.01
076 Service Water												
078 Instrument Air												
K/A Category Point Totals:	0	1	1	1	0	0	1	0	0	0	0	Group Point Total:

Plant-Specific Priorities

System / Topic	Recommended Replacement for...	Rea

Plant-Specific Priority Total: (limit 10)

Facility: Date of Exam: Exam Level:

Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.12	Ability to apply tech spec for a system	4.0	1
	2.1.16	Ability to operate any phone or pager system and 2-way radio	2.8	1
	2.1.23	Ability to perform specific system and integrated plant procedures during all modes of plant operation	4.0	1
	2.1.32	Ability to explain and apply all system limits and precautions	3.8	1
	Total			4
Equipment Control	2.2.6	Knowledge of the process for making changes in procedures as described in the safety analysis report.	3.3	1
	2.2.12	Knowledge of surveillance procedures	3.4	1
	2.2.25	Knowledge of the bases in technical specifications for limiting conditions for operations and safety limits	2.6	1
	2.2.27	Knowledge of the refueling process	3.8	1
	Total			4
Radiation Control	2.3.1	Knowledge of 10 CFR: 20 and related facility radiation control requirements	3.0	1
	2.3.6	Knowledge of the requirements for reviewing and approving release permits	3.1	1
	2.3.9	Knowledge of the process for performing a planned gaseous radioactive release	3.4	1
	2.3.11	Ability to control radiation releases	3.2	1
	Total			4
Emergency Procedures/ Plan	2.4.1	Knowledge of EOP entry conditions and immediate action steps	4.6	1
	2.4.6	Knowledge of symptom based EOP mitigation strategies	4.0	1
	2.4.24	Knowledge of loss of cooling water procedures	3.7	1
	2.4.25	Knowledge of fire protection procedures	3.4	1
	2.4.46	Ability to verify that the alarms are consistent with the plant conditions	3.6	1
	Total			5
Tier 3 Point Total (RO/SRO)				17

Facility: SONGS		**Date of Examination:** 12/15/2003	
Examination Level: RO		**Operating Test Number:** 1	
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions	
A.1a	Conduct of Operations	2.1.21	Ability to obtain and verify controlled procedure copy. (3.1) JPM: Prepare a procedure change request using a Procedure Modification Permit (New JPM)
A.1b	Conduct of Operations	2.1.7	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. (3.7) JPM: Determine Shutdown Margin (Bank JPM)
A.2	Equipment Control	2.2.13	Knowledge of tagging and clearance procedures. (3.6) JPM: Review a Boundary Verification (Bank JPM)
A.3	Radiation Exposure Control	2.3.2	Knowledge of facility ALARA program. (2.5) JPM: Determine stay time for work to be performed (New JPM)
A.4	Emergency Plan	2.4.39	Knowledge of RO responsibilities in E-Plan implementation. (3.3) JPM: Initiate Initial Site Accountability Forms (New JPM)

Task Summary

A1a	Applicant will be given a set of conditions requiring a change to an existing procedure. The task will be to initiate a procedure change using a Procedure Modification Permit (PMP). The applicant must document the extent of the procedure change as well as identify any potential impact to plant operation.
A1b	Applicant will be given a set of plant conditions that include a CEA anomaly such as a stuck CEA. The task will be to determine Shutdown Margin by manually performing a calculation given the available conditions
A2	Applicant will be given a tagging boundary to verify. The tagging request will contain a critical error that the applicant must identify and correct prior to completing the verification
A3	Applicant will be given a task that will be performed in the RCA. The task is to determine stay time for the work performed based on conditions provided, including REP and task with applicable dose limitations, and a survey map of the area where the work will be performed
A4	Applicant will be given conditions requiring site accountability during an emergency event. The task is to initiate the Site Accountability form in accordance with the Emergency Plan.

Facility: SONGS		**Date of Examination:** 12/15/2003
Examination Level: SRO		**Operating Test Number:** 1
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1a	Conduct of Operations	2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation (4.0) JPM: Determine Time to Boil Margin for Shutdown Nuclear Safety (New JPM)
A.1b	Conduct of Operations	2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. (4.4) JPM: Review a Shutdown Margin calculation and direct appropriate actions (New JPM)
A.2	Equipment Control	2.2.13 Knowledge of tagging and clearance procedures (3.8) JPM: Evaluate (for approval) a work authorization request (Bank JPM)
A.3	Radiation Exposure Control	2.3.2 Knowledge of facility ALARA program. (2.9) JPM: Determine stay time for work to be performed and take action for change in radiological conditions (New JPM)
A.4	Emergency Plan	2.4.41 Knowledge of the emergency action level thresholds and classifications. (4.1) JPM: Perform Event Classification (Bank JPM)

Task Summary

A1a	Applicant will be given plant conditions where the RCS is in a Drained Down condition. The task will be to complete a calculation of RCS Time to Boil Margin for Shutdown Nuclear Safety, using applicable correction factors for each parameter or factor affecting the Time to Boil Margin
A1b	Applicant will be required to review a Shutdown Margin calculation that will require action in accordance with Technical Specifications. The task is to determine that Shutdown Margin does not meet requirements and determine the appropriate action in accordance with Technical Specifications
A2	Applicant will be required to review a work authorization for approval. The work authorization will contain critical errors that must be identified and corrected prior to approval.
A3	Applicant will be given a task that will be performed in the RCA. The task is to determine stay time for the work performed based on conditions provided, including REP and task with applicable dose limitations, and a survey map of the area where the work will be performed. When the candidate performs the task, a change in radiological conditions will require the candidate to take action to minimize exposure
A4	Applicant will be given a set of plant conditions requiring evaluation of the site emergency plan for event classification. The task is to determine the appropriate criteria and EAL and make the correct event classification in accordance with the emergency plan.

Facility:	SONGS Units 2 and 3	**Date of Examination:**	12/15/2003
Exam Level:	RO/SROI	**Operating Test No.:**	1

B.1: Control Room Systems

	System	JPM Description	Type Code*	Safety Function
S1	001 CEDMCS	Control Large ASI Oscillations	MSA	1
S2	006 ECCS	Drain SIT 2T007	DS	2
S3	041 SBCS	Cooldown to 530°F on SBCS following SGTR	NSE	4S
S4	003 RCP	Start RCP P-004	LMSA	4P
S5	026 CSS	Verify RAS Initiation *Repeat from Last NRC*	DASE	5
S6 (C1)	062 AC Distribution	Restore Bus 2A06 from 1E Cross Tie Operations	MC	6
S7	012 RPS	Set a CEAC INOP Flag in a CPC	DS	7

B.2 Facility Walk-Through

P1	001 CEDMCS	Perform Local ATWS Actions *Repeat from Last NRC*	DER	1
P2	039 MRSS	Manually open ADV	DA	4S
P3	064 EDG	Shutdown EDG and Transfer Control to Control Room	DE	6

* **Type Codes:** **(D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol Room, (S)imulator, (L)ow-Power, (R)CA, (E)OP/AB**

NOTES

S1 When candidate gains control of ASI, 2 CEAs will drop, requiring manual reactor trip

S3 New JPM to examine ability to use SBCS instead of ADVs for RCS C/D following SGTR

S4 Modified to provide for High Upper Thrust Bearing temperature requiring RCP Trip IAW ARPs

S5 Verification of RAS will indicate that equipment has failed to start. Manipulations of actuated equipment must be performed manually

S6 (C1) Will be performed as Control Room JPM.

P2 ADV will not open manually. Isolation valve must be throttled to minimize DP to allow for ADV opening

Facility: SONGS | Scenario No.: 1 | Op Test No.: 1

Examiners: _____ Candidates: _____ CRS

_____ _____ RO

_____ _____ PO

Initial Conditions: 53% Power, BOC. Dilution and power increase in progress
Train A CCW in service
HPSI P-017 OOS
MDAFW P-141 OOS
RM-7818 OOS

Turnover: Continue to raise power at 10% per hour

Critical Tasks: Establish minimum design safety injection flow rate
Re-establish RCS subcooling by establishing a primary to secondary heat sink

Event No.	Malf. No.	Event Type*	Event Description
1		(R) CO (N) ACO (N) CRS	Raise Power
2	TU10A	(C) ALL	Main Turbine HP Governor Valve fails closed
3	CC03A	(C) ACO	Train 'A' CCW Header Leak
4	CV02A CV03A	(C) CO	RCP P-001 Seal Failure
5	RC05A	(C) ALL	RCP P-001 Shaft Shear
6	RC03	(M) ALL	SBLOCA upon Reactor Trip
7	RP01C EC08D	(C) CO	HPSI Actuation Failure

(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

The crew will assume the shift at 53% power, Beginning of Cycle. A power increase is in progress in accordance with SO23-5-1.7, Power Operations.

After the crew has demonstrated control of the plant power change, Main Turbine HP Governor Control valve 'B' will fail closed, requiring the crew to stabilize the plant and respond to the failure in accordance with Annunciator Response Procedures and SO23-10-3, Operation of the Turbine Control and Protection System.

When the plant is stable and action for the failed governor control valve is complete, a rupture of the operating CCW loop will occur. The crew will diagnose the failure using Annunciator Response Procedures and SO23-13-7, Loss of Component Cooling Water/Salt Water Cooling. The crew will be required to start the idle CCW and SWC pumps and transfer cooling loads to the operable header. The ruptured header will be removed from service. The CRS will be required to evaluate Technical Specifications.

The following event is an RCP P-001 seal failure. The crew will respond in accordance with Annunciator Response Procedures and SO23-13-6, RCP Seal Failure. The crew will diagnose a failure of the lower and middle seals on RCP P-001, and the CRS will determine the need for a plant shutdown in accordance with SO23-5-1.7, Power Operations.

As the crew prepares to initiate a plant shutdown, RCP P-001 shaft shears, and the reactor will trip on low RCS loop flow.

A Small Break LOCA develops, and the remaining RCPs must be tripped due to CIAS actuation or loss of RCS subcooling. Additionally, the crew must manually start the available HPSI pump due to an automatic start failure.

The crew diagnoses a LOCA and enters SO23-12-3, LOCA. The crew will determine that RCS Subcooling is less than 20ºF and will take action to restore subcooling.

The scenario is terminated upon initiation of action to reestablish RCS Subcooling.

Risk Significance:

- Risk important components out of service: HPSI P-017, MDAFW P-141
- Failure of risk important system prior to trip: CCW Rupture
- Risk significant core damage sequence: SBLOCA with HPSI failure
- Risk significant operator actions: Manual HPSI initiation

Facility: SONGS | Scenario No.: 2 | Op Test No.: 1

Examiners: _____ Candidates: _____ CRS

_____ _____ RO

_____ _____ PO

Initial Conditions: 100% Power, MOC
Train A CCW in service
HPSI P-017 OOS
MDAFW P-141 OOS
RM-7818 OOS

Turnover: CREACUS surveillance is completed and restoration is in progress. Perform SO23-3-3.20, Attachment 1, steps 2.11.6 and 2.11.7

Critical Tasks: Depressurize RCS
Perform HPSI Throttle Stop

Event No.	Malf. No.	Event Type*	Event Description
1		(N) ACO	CREACUS alignment
2	RC15B	(I) CO	Pressurizer Pressure Transmitter PT-100Y Fails High
3	SG04C	(I) ACO	SG-E089 level transmitter fails high
4	FW09A	(C) ALL (R) CO	Main Feed Pump 'A' Trip – Load Reduction required
5	SG01B SG02B	(C) ALL	SG Tube Leak SG-E089
6	FW09B	(M) ALL	Main Feed Pump 'B' Trip – Reactor Trip required
7	TU07	(C) ACO	Turbine fails to trip. Manual trip required
8	MS05B	(M) ALL	ESDE outside containment SG-E089

(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

The crew will assume the shift at 100% power, Middle of Cycle. Initial conditions will require the crew to partially restore CREACUS from a surveillance run when they assume the shift.

The controlling Pressurizer Pressure Channel, PT-0100-Y, will fail high. The crew will take action in accordance with Annunciator Response Procedures and SO23-3-1.10, Pressurizer Pressure and Level Control. Channel X will be selected for control and the CRS will evaluate Technical Specifications.

When Pressurizer Pressure Control is restored, SG E089 level transmitter LT-1105 will fail high. The crew must take action to restore feed flow in accordance with Annunciator Response Procedures and SO23-13-24, Feedwater Control System Malfunction. SG E089 level will ultimately be restored to automatic control by contacting I&C.

When SG level control is restored to automatic, Main Feedwater Pump P-062 will trip on high vibration, requiring a rapid power reduction to approximately 75-80% power in accordance with SO23-13-24 and SO23-5-1.7, Power Operations.

When the plant is stabilized, a steam generator tube leak will develop on SG E089. The crew will respond in accordance with Annunciator Response Procedures, SO23-13-14, Reactor Coolant Leak, and Technical Specifications. The CRS will determine that a reactor shutdown is required due to excessive primary to secondary leakage.

When preparations for plant shutdown are being made, Main Feedwater Pump P-063 will trip, requiring a reactor trip.

The Main Turbine fails to automatically trip and must be manually tripped. The steam generator tube leak will increase in severity, and after the Main Turbine is manually tripped an ESDE outside containment will occur on SG E089.

The crew will diagnose a SGTR and ESDE on SG E089, and enters SO23-12-9, Functional Recovery.

The scenario is terminated when RCS pressure reduction is in progress and HPSI is throttled.

<u>Risk Significance:</u>

- Risk important components out of service: HPSI P-017, MDAFW P-141
- Risk significant initiating event: Loss of Main Feedwater
- Risk significant operator actions: Turbine Trip, RCS depressurization

Facility: SONGS | Scenario No.: 3 | Op Test No.: 1

Examiners: _____ Candidates: _____ CRS

_____ _____ RO

_____ _____ PO

Initial Conditions: 100% Power, MOC.
Train A CCW in service
HPSI Pump P-017 OOS
MDAFW Pump P-141 OOS
RM-7818 OOS

Turnover: Maintain current plant conditions

Critical Tasks: Restore AFW flow
Initiate Emergency Boration

Event No.	Malf. No.	Event Type*	Event Description
1	RC16B	(I) CO	Controlling PZR Level Channel Y Fails Low
2	CW05B	(C) ACO	Circulating Water Pump P-116 Trips
3		(R) CO (N) ACO/CRS	Load Reduction
4	CV17A	(C) CO	BAMU Pump P-174 Trip
5	TP02B	(C) ACO	TPCW Pump P-120 Trip. P-119 Auto Start Failure.
6	PG05	(M) ALL	Main Generator trip on Main Transformer Sudden pressure
7	RD0242 RD0248	(C) CO	Two Stuck CEAs. Emergency Boration required
8	FW25	(C) ACO	SDAFW Overspeed
9	FW02B		MDAFW P-504 Trip

(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

The crew will assume the shift at 100% power, Middle of Cycle.

The controlling Pressurizer Level Channel, LI-0110, Channel Y, fails low. The crew will take action to stabilize Charging and Letdown flow, and transfer pressurizer level control and heater operation to channel X, in accordance with SO23-3-1.10, Pressurizer Pressure and Level Control. The CRS will evaluate Technical Specifications.

When Pressurizer Level Control is restored to automatic, Circulating Water Pump P-116 trips on overcurrent. The crew will respond in accordance with Annunciator Response Procedures to determine that Main Condenser Vacuum remains in the unrestricted area of operation, and SO23-2-5, Circulating Water System Operation, to remove the Circulating Water Pump and condenser section from service. Based on the expected outage period, the crew will determine that a power reduction is required.

When the CO initiates RCS boration for the power reduction, the in-service BAMU Pump will trip, requiring manual operation to start the standby BAMU Pump.

When the RCS boration is in progress, TPCW Pump P-120 will trip, and P-119 fails to automatically start. The crew must manually start TPCW Pump P-119 in accordance with Annunciator Response Procedures to prevent a plant trip on High Stator Cooling Water temperature.

When TPCW is restored and the load decrease is in progress, a Main Transformer Fault will occur. The Main Generator will trip, causing a Main Turbine trip. When the reactor trips, two CEAs will be stuck, requiring Emergency Boration of the RCS.

Additionally, Main Condenser Vacuum is lost on the reactor trip, making Main Feedwater and SBCS unavailable. Turbine Driven AFW Pump P-140 trips on overspeed.

The crew will transition to SO23-13-2, Reactor Trip Recovery. Subsequent AFW Pump P-504 failure will require entry to SO23-12-6, Loss of Feedwater.

AFW will be restored by manual reset and start of the Turbine Driven AFW pump P-140.

The scenario is terminated when feedwater flow is restored.

Risk Significance:

- Risk important components out of service: HPSI P-017, MDAFW P-141
- Risk significant initiating event: Turbine Trip, Loss of Power
- Risk significant operator actions: RCS boration, SDAFW initiation