

*One thing to keep in mind that might make this process easier so that 75% of the questions are common for both exams & then 25 different questions*

Facility:		Seabrook		Date of Exam:		05/30/03		Exam Level:		RO		Point Total	
Tier	Group	K/A Category Points											
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	A 5	Point Total
1. Emergency & Abnormal Plant Evolutions	1	3	3	3				3	2			2	16
	2	3	4	3				3	2			2	17
	3	1	1	0				1	0			1	3
	Tier Totals	7	8	6				7	4			4	36
2. Plant Systems	1	2	2	2	2	2	2	3	2	2	2	2	23
	2	2	2	2	2	1	2	2	2	2	2	1	20
	3	1	1	0	0	1	1	1	1	1	1	0	8
	Tier Totals	5	5	4	4	4	5	6	5	5	5	3	51
3. Generic Knowledge and Abilities				Cat 1		Cat 2		Cat 3		Cat 4			
				3		3		3		4			

- Note:
1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).
  2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by  $\pm 1$  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.

*Good! Looks as if you did that as well. I counted at least 75 common topics. However, some of these may not be indicated.*

ES-401

PWR RO Examination Outline  
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

Form ES-401-4

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000005 Inoperable/Stuck Control Rod / 1	X						AK1.05 Calculation of minimum shutdown margin	3.3	1
000015/17 RCP Malfunctions / 4						X	2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	3.7	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4					X		EA2.1 Facility conditions and selection of appropriate procedures during abnormal and emergency operations.	3.1	1
000024 Emergency Boration / 1				X			AA1.17 Emergency borate control valve and indicators	3.9	1
000026 Loss of Component Cooling Water / 8			X				AK3.01 The conditions that will initiate the automatic opening and closing of the SWS isolation valves to the CCWS coolers	3.2	1
000027 Pressurizer Pressure Control System Malfunction / 3		X					AK2.03 Controllers and positioners	2.6	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4	X						EK1.2 Normal, abnormal and emergency operating procedures associated with (Uncontrolled Depressurization of all Steam Generators).	3.5	1
CE/A11; W/E08 RCS Overcooling - PTS / 4		X					EK2.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.4	1
000051 Loss of Condenser Vacuum / 4			X				AK3.01 Loss of steam dump capability upon loss of condenser vacuum	2.8	1
000055 Station Blackout / 6				X			EA1.07 Restoration of power from offsite	4.3	1
000057 Loss of Vital AC Elec. Inst. Bus / 6					X		AA2.20 Interlocks in effect on loss of ac vital electrical instrument bus that must be bypassed to restore normal equipment operation	3.6	1
000062 Loss of Nuclear Service Water / 4						X	2.4.12 Knowledge of general operating crew responsibilities during emergency operations.	3.4	1
000067 Plant Fire On-site / 9	X						AK1.01 Fire classifications, by type	2.9	1
000069 (W/E14) Loss of CTMT Integrity / 5		X					EK2.2 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.	3.4	1
000074 (W/E06&E07) Inad. Core Cooling / 4			X				EK3.3 Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations.	4.0	1
000076 High Reactor Coolant Activity / 9				X			AA1.04 Failed fuel-monitoring equipment	3.2	1
K/A Category Totals:	3	3	3	3	2	2	Group Point Total:		16

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
<del>000001 Continuous Rod Withdrawal / 1</del>									
000003 Dropped Control Rod / 1				X			AA1.01 Demand position counter and pulse/analog converter	2.9	1
000008 Pressurizer Vapor Space Accident / 3			X				AK3.03 Actions contained in EOP for PZR vapor space accident/ LOCA	4.1	1
000009 Small Break LOCA / 3		X					EK2 Knowledge of the interrelations between the small break LOCA and the following: EK2.03 S/Gs	3.0	1
000011 Large Break LOCA / 3	X						EK1.01 Natural circulation and cooling, including reflux boiling.	4.1	1
W/E04 LOCA Outside Containment / 3		X					EK2.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.5	1
<del>BW/E08; W/E03 LOCA Cooldown/Depress. / 4</del>									
W/E11 Loss of Emergency Coolant Recirc. / 4			X				EK3.3 Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations.	3.8	1
W/E01 & E02 Rediagnosis & SI Termination / 3				X			EA1.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.7	1
000022 Loss of Reactor Coolant Makeup / 2					X		AA2.02 Charging pump problems	3.2	1
000025 Loss of RHR System / 4						X	2.1.12 Ability to apply technical specifications for a system.	2.9	1
000029 Anticipated Transient w/o Scram / 1	X						EA2.01 Reactor nuclear instrumentation	4.4	1
000032 Loss of Source Range NI / 7		X					AK2.01 Power supplies, including proper switch positions	2.7	1
<del>000033 Loss of Intermediate Range NI / 7</del>									
<del>000037 Steam Generator Tube Leak / 3</del>									
000038 Steam Generator Tube Rupture / 3			X				EK3.05 Normal operating precautions to preclude or minimize SGTR	4.0	1
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4				X			EA1.2 Operating behavior characteristics of the facility.	3.7	1
<del>000058 Loss of DC Power / 6</del>									
000059 Accidental Liquid RadWaste Rel. / 9					X		AA2.05 The occurrence of automatic safety actions as a result of a high PRM system signal	3.6	1
000060 Accidental Gaseous Radwaste Rel. / 9						X	2.4.39 Knowledge of the RO's responsibilities in emergency plan implementation.	3.3	1
000061 ARM System Alarms / 7	X						AK1.01 Detector limitations	2.5	1
W/E16 High Containment Radiation / 9		X					EK2.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.0	1
<del>GE/E09 Functional Recovery</del>									
<b>K/A Category Point Totals:</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>Group Point Total:</b>		<b>17</b>



System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive					X	X						K5.54 Definition and units of reactivity K6.09 Purpose and operation of neutron flux recorder at high speed concentration	2.8 2.9	2
003 Reactor Coolant Pump							X				X	A1.02 RCP pump and motor bearing temperatures 2.1.27 Knowledge of system purpose and or function.	2.9 2.8	2
004 Chemical and Volume Control		X						X				K2 Knowledge of bus power supplies to the following: K2.05 MOVs A2.27 Improper RWST boron concentration	2.7 3.5	2
013 Engineered Safety Features Actuation									X			A3.01 Input channels and logic	3.7	1
015 Nuclear Instrumentation										X		A4.03 Trip bypasses	3.8	1
017 In-core Temperature Monitor										X	X	A4.02 Temperature values used to determine RCS/RCP operation during inadequate core cooling (i.e., if applicable, average of five highest values) 2.1.28 Knowledge of the purpose and function of major system components and controls.	3.8 3.2	2
022 Containment Cooling		X		X								K2.01 Containment cooling fans K4.02 Correlation of fan speed and flowpath changes with containment pressure	3.0 3.1	2
056 Condensate	X							X				K1 Knowledge of the physical connections and/or cause-effect relationships between the Condensate system and the following systems: K1.03 MFW A2 Ability to (a) predict the impacts of the following malfunctions or operations on the Condensate System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: A2.04 Loss of condensate pumps	2.6 2.6	2
059 Main Feedwater			X				X					K3 Knowledge of the effect that a loss or malfunction of the MFW will have on the following: K3.04 PCS A1.07 Feed Pump speed, including normal control speed of ICS	3.6 2.5	2
061 Auxiliary/Emergency Feedwater			X			X						K6 Knowledge of the effect of a loss or malfunction of the following will have on the AFW components: K6.02 Pumps K3 Knowledge of the effect that a loss or malfunction of the AFW will have on the following: K3.02 S/G	2.6 4.2	2



*Generally Purpose questions May not document?*

ES-401		PWR RO Examination Outline Plant Systems - Tier 2/Group 2										Form ES-401-4											
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points									
002 Reactor Coolant								X				A2.03 Loss of forced circulation	4.1	1									
006 Emergency Core Cooling							X					A1.14 Reactor vessel level	3.5	1									
010 Pressurizer Pressure Control						X						K6.02 PZR	3.2	1									
011 Pressurizer Level Control					X							K5.12 Criteria and purpose of PZR level program	2.7	1									
012 Reactor Protection				X								K4.07 First-out indication	3.0	1									
014 Rod Position Indication			X									K3.02 Plant computer	2.5	1									
016 Non-nuclear Instrumentation	X											K1.06 AFW system	3.6	1									
026 Containment Spray										X		A4.01 CSS controls	4.5	1									
029 Containment Purge											X	2.4.31 Knowledge of annunciators alarms and indications, and use of the response instructions.	3.3	1									
033 Spent Fuel Pool Cooling									X			A3.02 Spent fuel leak or rupture	2.9	1									
035 Steam Generator										X		A4.06 S/G isolation on steam leak or tube rupture/leak	4.5	1									
039 Main and Reheat Steam								X				A2.04 Malfunctioning steam dump	3.4	1									
055 Condenser Air Removal			X									K3.01 Main condenser	2.5	1									
062 AC Electrical Distribution				X								K4.07 One-line diagram of 4kV to 480V distribution, including sources of normal and alternative power	2.7	1									
063 DC Electrical Distribution	X											K1.02 AC electrical system	2.7	1									
064 Emergency Diesel Generator						X						K6.07 Air receivers	2.7	1									
073 Process Radiation Monitoring							X					A1.01 Radiation levels	3.2	1									
075 Circulating Water		X										K2.03 Emergency/essential SWS pumps	2.6	1									
079 Station Air								X				A2.01 Cross-connection with IAS	2.9	1									
086 Fire Protection									X			A3.02 Actuation of the FPS	2.9	1									
K/A Category Point Totals:											2	1	2	2	1	2	2	3	2	2	1	Group Point Total:	20

3

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal										X		A4.02 Heat exchanger bypass flow control	3.4	1
007 Pressurizer Relief/Quench Tank	X											K1.03 RCS	3.0	1
008 Component Cooling Water		X										K2.02 CCW pump, including emergency backup	3.0	1
027 Containment Iodine Removal					X							K5.01 Purpose of charcoal filters	3.1	1
028 Hydrogen Recombiner and Purge Control								X				A2.02 LOCA condition and related concern over hydrogen	3.5	1
034 Fuel Handling Equipment						X						K6.02 Radiation monitoring systems	2.6	1
041 Steam Dump/Turbine Bypass Control														
045 Main Turbine Generator							X					A1.06 Expected response of secondary plant parameters following T/G trip	3.3	1
076 Service Water														
078 Instrument Air									X			A3.01 Air pressure	3.1	1
403 Containment														

<b>K/A Category Point Totals:</b>	1	1			1	1	1	1	1	1		<b>Group Point Total:</b>		8
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Plant-Specific Priorities

System / Topic	Recommended Replacement for...	Reason	Points

Plant-Specific Priority Total: (limit 10)



Facility: Seabrook		Date of Exam: 05/30/03		Exam Level: RO	
Category	K/A #	Topic	Imp.	Points	
Conduct of Operations	2.1.2	Knowledge of operator responsibilities during all modes of plant operation.	3.0	1	
	2.1.21	Ability to obtain and verify controlled procedure copy.	3.1	1	
	2.1.24	Ability to obtain and interpret station electrical and mechanical drawings.	2.8	1	
	Total			3	
Equipment Control	2.2.12	Knowledge of surveillance procedures.	3.0	1	
	2.2.25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	2.5	1	
	2.2.11	Knowledge of shift turnover practices.	2.5	1	
	Total			3	
Radiation Control	2.3.2	Knowledge of facility ALARA program.	2.5	1	
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5	1	
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	2.9	1	
	Total			3	
Emergency Procedures/Plan	2.4.1	Knowledge of EOP entry conditions and immediate action steps.	4.3	1	
	2.4.10	Knowledge of annunciator response procedures.	3.0	1	
	2.4.15	Knowledge of communications procedures associated with EOP implementation.	3.0	1	
	2.4.2	Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.	3.9	1	
	Total			4	
<b>Tier 3 Point Total</b>				<b>13</b>	

13  
~~10~~    ~~7X~~    ~~7X~~  
 75

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Facility: Seabrook		Date of Exam: 05/30/2003		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	5	4	4									1	24
	2	2	4	3									4	16
	3	1	1	0									0	3
	Tier Totals	8	9	7									5	43
2. Plant Systems	1	2	0	3	1	2	0	3	2	2	2	2		19
	2	1	1	1	2	1	2	2	3	2	1	1		17
	3	1	1	0	0	0	0	0	0	1	1	0		4
	Tier Totals	4	2	4	3	3	2	5	5	5	4	3		40
3. Generic Knowledge and Abilities				Cat 1		Cat 2		Cat 3		Cat 4		17		
				4		4		4		5				

Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).

2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by  $\pm 1$  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.

*George, Looks good overall. See my comments & we can discuss this a good starting point. I've got write good documentation for the K/As selected. Main source comes from C 12/31/02*

ES-401

PWR SRO Examination Outline  
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

Form ES-401-3

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1 ***		X					AK2.08 Individual rod display lights and indications	3.0	1
000003 Dropped Control Rod / 1				X			AA1.01 Demand position counter and pulse/analog converter	2.9	1
000005 Inoperable/Stuck Control Rod / 1	X						AK1.05 Calculation of minimum shutdown margin	4.1	1
000011 Large Break LOCA / 3	X						EK1.01 Natural circulation and cooling, including reflux boiling.	4.4	1
W/E04 LOCA Outside Containment / 3		X					EK2.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.9	1
W/E01 & E02 Rediagnosis & SI Termination / 3				X			EA1.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.7	1
000015/17 RCP Malfunctions / 4 ***			X				AK3.07 Ensuring that S/G levels are controlled properly for natural circulation enhancement	4.2	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4					X		EA2.1 Facility conditions and selection of appropriate procedures during abnormal and emergency operations.	3.8	1
000024 Emergency Boration / 1				X			AA1.17 Emergency borate control valve and indicators	3.9	1
000026 Loss of Component Cooling Water / 8			X				AK3.01 The conditions that will initiate the automatic opening and closing of the SWS isolation valves to the CCWS coolers	3.5	1
000029 Anticipated Transient w/o Scram / 1					X		EA2.01 Reactor nuclear instrumentation	4.7	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4	X						EK1.2. Normal, abnormal and emergency operating procedures associated with (Uncontrolled Depressurization of all Steam Generators).	3.8	1
CE/A11; W/E08 RCS Overcooling - PTS / 4		X					EK2.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.7	1
000051 Loss of Condenser Vacuum / 4			X				AK3.01 Loss of steam dump capability upon loss of condenser vacuum	3.1	1
000055 Station Blackout / 6				X			EA1.07 Restoration of power from offsite	4.5	1
000057 Loss of Vital AC Elec. Inst. Bus / 6					X		AA2.20 Interlocks in effect on loss of ac vital electrical instrument bus that must be bypassed to restore normal equipment operation	3.9	1
000059 Accidental Liquid RadWaste Rel. / 9 ***					X		AA2.05 The occurrence of automatic safety actions as a result of a high PRM system signal	3.9	1
000062 Loss of Nuclear Service Water / 4 ***				X*		X	2.4.12 Knowledge of general operating crew responsibilities during emergency operations. AA2.05 normal values for SWS-header flow rate and the flow rates to the components cooled by the SWS	3.9	2
000067 Plant Fire On-site / 9	X						AK1.01 Fire classifications, by type	3/9	1

~~What are these for?~~

might be tough SRO

OK SRO

NOT really SRO

SRO only maybe? Should k both

\*\* meaning anything?

May be hard to document writing question on this subject.



E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000008 Pressurizer Vapor Space Accident / 3			X				AK3.03 Actions contained in EOP for PZR vapor space accident/ LOCA	4.6	1
000009 Small Break LOCA / 3		X					EK2 Knowledge of the interrelations between the small break LOCA and the following: EK2.03 S/Gs	3.3	1
BW/E08; W/E03 LOCA Cooldown - Depress. / 4									
WE11 Loss of Emergency Coolant Recirc. / 4 *** ?			X				EK3.3 Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations.	3.8	1
000022 Loss of Reactor Coolant Makeup / 2					X		AA2.02 Charging pump problems	3.7	
000025 Loss of RHR System / 4						X	2.1.12 Ability to apply technical specifications for a system.		
000027 Pressurizer Pressure Control System Malfunction / 3		X					AK2.03 Controllers and positioners		1
000032 Loss of Source Range NI / 7		X					AK2.01 Power supplies, including proper switch positions	3.1	1
000033 Loss of Intermediate Range NI / 7 *** ?						X	2.2.1 Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.	3.6	1
000037 Steam Generator Tube Leak / 3 *** ?						X	2.4.20 Knowledge of operational implications of EOP warnings, cautions, and notes.	4.0	1
000038 Steam Generator Tube Rupture / 3			X				EK3.05 Normal operating precautions to preclude or minimize SGTR	4.3	1
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4				X			EA1.2 Operating behavior characteristics of the facility.		
000058 Loss of DC Power / 6 *** ?	X						AK1.01 Battery charger equipment and instrumentation	3.1	
000060 Accidental Gaseous Radwaste Rel. / 9						X	2.4.39 Knowledge of the RO's responsibilities in emergency plan implementation.	3.1	1
000061 ARM System Alarms / 7	X						AK1.01 Detector limitations	2.9	1
WE16 High Containment Radiation / 9		X					EK2.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.3	1
000065 Loss of Instrument Air / 8 *** ?				X			AA1.02 Components served by instrument air to minimize drain on system	2.8	1
<b>K/A Category Point Totals:</b>	<b>2</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>Group Point Total:</b>		<b>16</b>

Maybe he OK for SRO just depends

NOTE: This would be a good candidate for SRO only

normally RO task

Better written as SRO responsibilities

RO question

System RO level

NOTE: Maybe better as an SRO only question Remember 25 is written at the SRO level. Must be only



System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive					X							K5.54 Definition and units of reactivity	3.1	1
003 Reactor Coolant Pump							X				X	A1.02 RCP pump and motor bearing temperatures 2.1.27 Knowledge of system purpose and or function.	2.9 2.9	2
004 Chemical and Volume Control								X				A2.27 Improper RWST boron concentration	4.2	
013 Engineered Safety Features Actuation									X			A3.01 Input channels and logic		
014 Rod Position Indication			X									K3.02 Plant computer	2.8	
015 Nuclear Instrumentation ***										X		A4.03 Trip bypasses	3.9	1
017 In-core Temperature Monitor											X	2.1.28 Knowledge of the purpose and function of major system components and controls.	3.3	1
022 Containment Cooling				X								K4.02 Correlation of fan speed and flow-path changes with containment pressure	3.4	1
026 Containment Spray										X		A4.01 CSS controls	4.3	1
056 Condensate	X							X				K1 Knowledge of the physical connections and/or cause-effect relationships between the Condensate system and the following systems: K1.03 MFW A2.04 Loss of condensate pumps	2.6 2.8	2
059 Main Feedwater			X				X					K3.04 RCS A1.07 Feed Pump speed, including normal control speed for RCS	3.8 2.6	2
061 Auxiliary/Emergency Feedwater			X									K3 Knowledge of the effect that a loss or malfunction of the AFW will have on the following: K3.02 S/G	4.4	1
063 DC Electrical Distribution	X											K1.02 AC electrical system	3.2	
068 Liquid Radwaste ***					X							K5.04 Biological hazards of radiation and the resulting goal of ALARA	3.5	
071 Waste Gas Disposal									X			A3.03 Radiation monitoring system alarm and actuating signals	3.8	1
072 Area Radiation Monitoring							X					A1.01 Radiation levels	3.6	1
<b>K/A Category Point Totals:</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>Group Point Total:</b>		<b>19</b>

*Look like closely related May need to reselect*

*Depends on how SRO written*

*Depends on how written whether SRO*

*NO ICS*

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant ***								X				A2.03 Loss of forced circulation	4.3	1
006 Emergency Core Cooling							X					A1.14 Reactor vessel level	3.9	1
010 Pressurizer Pressure Control						X						K6.02 PZR	3.5	1
<del>011 Pressurizer Level Control</del>														
<del>012 Reactor Protection</del>														
016 Non-nuclear Instrumentation	X											K1.06 AFW system	3.5	1
027 Containment Iodine Removal					X							K5.01 Purpose of charcoal filters	3.4	1
<del>028 Hydrogen Recombiner and Purge Control</del>														
029 Containment Purge											X	2.4.31 Knowledge of annunciators alarms and indications, and use of the response instructions.	3.4	1?
033 Spent Fuel Pool Cooling ***									X			A3.02 Spent fuel leak or rupture	3.1	1
034 Fuel Handling Equipment ***						X						K6.02 Radiation monitoring systems	3.3	1
035 Steam Generator										X		A4.06 S/G isolation on steam leak or tube rupture/leak	4.6	1
039 Main and Reheat Steam								X				A2.04 Malfunctioning steam dump	3.7	1
055 Condenser Air Removal			X									K3.01 Main condenser	2.7	1
062 AC Electrical Distribution				X								K4.07 One-line diagram of 4kV to 480V distribution, including sources of normal and alternative power	3.1	1
<del>064 Emergency Diesel Generator</del>														
073 Process Radiation Monitoring							X					A1.01 Radiation levels	3.5	1
075 Circulating Water		X										K2.03 Emergency/essential SWS pumps	2.7	1
079 Station Air								X				A2.01 Cross-connection with IAS	3.2	1
086 Fire Protection									X			A3.02 Actuation of the FPS	3.3	4
103 Containment ***										X		A4.04 Phase A and phase B resets	3.5	1
<b>K/A Category Point Totals:</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>Group Point Total:</b>		<b>17</b>

*SRO only?*

*SRO only?*

*Why crossed out? just didn't pick at random? unnecessary to cross out*





Plant-Specific Priority Total: (limit 10)

NUREG-1021, Revision 8, Supplement 1

32 of 46

*May want to replace tested during Exam*

Facility: Seabrook		Date of Exam: 05/30/03		Exam Level: SRO	
Category	K/A #	Topic	Imp.	Points	
Conduct of Operations	2.1.2	Knowledge of operator responsibilities during all modes of plant operation.	4.0	1	
	2.1.21	Ability to obtain and verify controlled procedure copy.	3.2	1	
	2.1.24	Ability to obtain and interpret station electrical and mechanical drawings ***	3.1	1	
	2.1.31	Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup.	3.9	1	
	Total				4
Equipment Control	2.2.12	Knowledge of surveillance procedures.	3.4	1	
	2.2.25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits. *** <i>slo only</i>	3.7	1	
	2.2.11	Knowledge of shift turnover practices.	3.4	1	
	2.2.13	Knowledge of tagging and clearance procedures. ***	3.8	1	
	Total				4
Radiation Control	2.3.2	Knowledge of facility ALARA program. ***	3.0	1	
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized. ***	2.9	1	
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	3.1	1	
	2.3.1	Knowledge of 10 CFR: 20 and related facility radiation control requirements.	3.0	1	
	Total				4
Emergency Procedures/ Plan	2.4.1	Knowledge of EOP entry conditions and immediate action steps. ***	4.6	1	
	2.4.10	Knowledge of annunciator response procedures.	3.1	1	
	2.4.15	Knowledge of communications procedures associated with EOP implementation.	3.5	1	
	2.4.2	Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions. ***	4.1	1	
	2.4.11	Knowledge of abnormal condition procedures.	3.6	1	
	Total				5
<b>Tier 3 Point Total</b>					<b>17</b>

*Normally no level maybe OK*

Facility: Seabrook		Date of Exam: 05/30/03		Exam Level: RO	
Category	K/A #	Topic	Imp.	Points	
Conduct of Operations	2.1.2	Knowledge of operator responsibilities during all modes of plant operation.	3.0	1	
	2.1.1	Knowledge of conduct of operations requirements.	3.7	1	
	2.1.11	Knowledge of less than one-hour technical specification action statement for systems.	3.0	1	
	Total			3	
Equipment Control	2.2.12	Knowledge of surveillance procedures.	3.0	1	
	2.2.25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	2.5	1	
	2.2.11	Knowledge of shift turnover practices.	2.5	1	
	Total			3	
Radiation Control	2.3.2	Knowledge of facility ALARA program.	2.5	1	
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5	1	
	2.3.1	Knowledge of 10CFR20 and related facility radiation control requirements.	2.6	1	
	Total			3	
Emergency Procedures/ Plan	2.4.1	Knowledge of EOP entry conditions and immediate action steps.	4.3	1	
	2.4.10	Knowledge of annunciator response procedures.	3.0	1	
	2.4.21	Knowledge of the parameters and logic used to assess the status of safety functions.	3.7	1	
	2.4.2	Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.	3.9	1	
	Total			4	
Tier 3 Point Total				13	

Facility: Seabrook		Date of Exam: 05/30/03		Exam Level: SRO	
Category	K/A #	Topic	Imp.	Points	
Conduct of Operations	2.1.2	Knowledge of operator responsibilities during all modes of plant operation.	4.0	1	
	2.1.10	Knowledge of conditions and limitations in the facility license.	3.9	1	
	2.1.11	Knowledge of less-than-1-hour technical specification statements for systems	3.8	1	
	2.1.4	Knowledge of shift staffing requirements.	3.4	1	
	Total				4
Equipment Control	2.2.12	Knowledge of surveillance procedures.	3.4	1	
	2.2.25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	1	
	2.2.11	Knowledge of the process for controlling temporary changes.	3.4	1	
	2.2.13	Knowledge of tagging and clearance procedures.	3.8	1	
	Total				4
Radiation Control	2.3.2	Knowledge of facility ALARA program.	2.9	1	
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	3.1	1	
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	3.3	1	
	2.3.1	Knowledge of 10 CFR: 20 and related facility radiation control requirements.	3.0	1	
	Total				4
Emergency Procedures/ Plan	2.4.1	Knowledge of EOP entry conditions and immediate action steps.	4.6	1	
	2.4.10	Knowledge of annunciator response procedures.	3.1	1	
	2.4.15	Knowledge of communications procedures associated with EOP implementation.	3.5	1	
	2.4.2	Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.	4.1	1	
	2.4.11	Knowledge of abnormal condition procedures.	3.6	1	
	Total				5
Tier 3 Point Total					17

Facility: <u>Seabrook Station</u>		Date of Examination: <u>6/02/03-6/05/03</u>
Examination Level (circle one): <b>RO</b>		Operating Test Number: <u>1</u>
Administrative Topic/Subject Description		Describe method of evaluation:
		1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	QPTR Calculation JPM	2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation. RO: 3.9.  JPM: Perform required QPTR due to PRNI failure.
	SDM Calculation JPM	2.1.25 Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data. RO: 2.8.  JPM: Perform a SDM calculation for Natural Circulation Cooldown.
A.2	Tagout JPM	2.2.13 Knowledge of tagging and clearance procedures. RO: 3.6.  JPM: Generate a danger tagout.
A.3	High Radiation Area Question	2.3.4 Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized. RO: 2.5.  Question: Given the plant is in a Site Area Emergency, what is the highest dose a worker is allowed to receive in a non-emergency operation.
	Contamination Control Question	2.3.1 Knowledge of 10CFR20 and related facility radiation control requirements. RO: 2.6.  Question: Requirements for a Locked High Rad Area.
A.4	RO's Responsibilities During Emergency Plan Implementation	2.4.39 Knowledge of the RO's responsibilities in emergency plan implementation. RO: 3.3.  Question: E Plan reporting requirements during training (off watch).
		2.4.39 Knowledge of the RO's responsibilities in emergency plan implementation. RO: 3.3.  Question: Operator responsibilities during SGTR event.

Facility: <u>Seabrook Station</u>		Date of Examination: <u>6/02/03-6/05/03</u>
Examination Level: <b>SRO</b>		Operating Test Number: <u>1</u>
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Loss of RHR Cooling	2.1.25 Ability to obtain and interpret station reference materials such as as graphs, monographs, and tables which contain performance data. SRO: 3.1.  JPM: Evaluate loss of cooling conditions and determine time to boiling from chart.
	SDM Calculation Review	2.1.25 Ability to obtain and interpret station reference materials such as as graphs, monographs, and tables which contain performance data. SRO: 3.1.  JPM: Review a SDM calculation for Natural Circulation Cooldown.
A.2	Tagouts	2.2.13 Knowledge of tagging and clearance procedures. SRO: 3.8.  JPM: Review a tagout request.
A.3	Radiation control	2.3.4 Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized. SRO: 3.1  JPM: Contaminated injured man actions.
A.4	Emergency Classification, Notifications, and PAR. JPM	2.4.38 Ability to take actions called for in the facility emergency plan, including (if required) supporting or acting as emergency coordinator. SRO: 4.0  JPM: Given a set of conditions, the applicant will make an EAL determination, PAR, and make required notifications.

Facility: Seabrook Station Exam Level (circle one): RO / SRO(I) / SRO(U)		Date of Examination: 6/02/03-6/06/03 Operating Test No.:	
B.1 Control Room Systems			
System / JPM Title		Type Code*	Safety Function
a. 001 Control Rod Drive / Power Increase to Criticality. Identify that the reactor goes critical below -500 pcm value.		N, A, S, L	1
b. 006 ECCS / Transfer SI to Cold Leg Recirculation (CBS-V14 fails) (SRO-U)		D, A, S	2
c. 010 Primary Pressure Control System / Depressurize the RCS during a natural circulation cooldown with letdown unavailable IAW ES-0.2. (SRO-U)		N, A, S	3
d. 062 AC Electrical distribution / Loss of All AC Power; failure of EPS on shutting EDG output breaker.		N, A, S	6
e. 028 Hydrogen Recombiners / Start hydrogen recombiners. (SRO-U)		D, S	5
f. 012 RPS Power Range NI Failure		D, S	7
g. 004 Blended Makeup Calculation and Performance		D, S	2
B.2 Facility Walk-Through			
a. 005 RHR / Manual Operation of RHR TCV for mid-loop operations. (SRO-U)		D, R	4(pri)
b. 064 EDG / Local EDG Normal Start and Load (SRO-U)		D	6
c. 061 EFW / Reset the TDEFW pump turbine trip throttle valve.		D	4(sec)
* 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			



Facility: Seabrook Station Scenario No.: 1 Op-Test No.: 1

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Initial Conditions: 75% power

Turnover: The reactor is at 75%. The dispatcher has requested that Seabrook Station reduce power to 50% in an expeditious manner.

Event No.	Malf. No.	Event Type*	Event Description
1		R(US,RO) N(BOP)	Crew continues downpower in accordance with OS1000.06, "Power Decrease".
2	ptFWPT505	I(ALL)	PT-505 fails low; control rods automatically insert.
3	LTRCLT459	I(US) I(RO)	Controlling PZR level channel, LT-459, fails low. Charging increases and letdown isolates.
4		N(RO)	Restore letdown to service.
5	MFED037	M(ALL)	Main generator breaker trips open (faulty 86 relay) causing a loss of load turbine trip/reactor trip.
6,7	vpRCPV456A MS-V6 MS-V7	C(US,BOP) C(US,RO)	One PZR PORV and two S/G safety valves open and fail open.
8	MFRPS019 MFRPS020	C(US,BOP)	MSIVs are failed open and will not close automatically.

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

Facility: Seabrook Station Scenario No.: 2 Op-Test No.: 1

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Initial Conditions: Reactor is at 10<sup>-8</sup> amps. CCP 'B' is tagged out for maintenance.

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Turnover: Power increase is in progress. Current power level is 10<sup>-8</sup> amps. Continue power increase to raise reactor power to minimum loading.

Event No.	Malf. No.	Event Type*	Event Description
1		R(RO) N(US,BOP)	Normal power increase to minimum loading in accordance with OS1000.02, "Plant Startup from Hot Standby to Minimum Load" and OS1000.07, "Approach to Criticality".
2	LTFWLT539	I(US,BOP)	S/G 'C' level transmitter, LT-539, fails high. 'C' S/G FRV bypass valve closes.
3	MFSG002	C(US,BOP)	30 GPD primary to secondary tube leak on S/G 'A'.
4	ptMSPK3001	C(US,BOP)	S/G 'A' ASDV fails OPEN.
5	ptRCPT455	I(US,RO)	PZR pressure instrument, PT-455 fails high. PZR spray initiates.
6	MFSG002	M(ALL)	S/G 'A' 500 gpm tube rupture.
7	MFCP005 AUTORODS MANUALRODS FRPS001 FRPS002 bkCPRTA bkCPRTB override Rx Trip SW	C(ALL)	Control rods fail to insert automatically and manually (ATWS).
8	MFCC016	C(US,RO)	CCP 'A' trips. Crew must start positive displacement pump to complete emergency boration.

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

Facility: Seabrook Station Scenario No.: 3 Op-Test No.: 1

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Initial Conditions: Reactor is at 75%

Turnover: Reactor power is at 75%. Crew must continue power decrease to remove 'A' SGFP from service. SW Pump 41C is tagged out for maintenance.

Event No.	Malf. No.	Event Type*	Event Description
1		N(US,RO) R(BOP)	Normal power reduction in accordance with OS1000.06, "Power Decrease"
2	IRCTT411	I(US,RO)	Loop 1 Tc fails high resulting in high Tave for loop1; rods insert automatically.
3	IFWFK509A	I(US,BOP)	SGFP master speed controller fails (pumps slow down).
4	MFRC006	C(US,RO)	PCCW leak to supply of 'C' RCP oil cooler. US will direct reactor trip on high RCP vibrations.
5	MFRC024	M(ALL)	Large Break LOCA.
6	MFRH005 MFRH006	C(US,BOP)	Both RHR and SI pumps fail to start automatically; manual start is required.
7	MFRPS013 MFRPS014	C(US,RO)	Containment isolation phase-B failed to auto initiate, manual action is required.
8	MFRH003 CCBSV14	(US,RO)	Loss of ECCS Recirculation

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

Facility: Seabrook Station Scenario No.: 4 Op-Test No.: 1

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Initial Conditions: Reactor is at 75%. EDG 'B' is faulted such that it will NOT start.

Turnover: Reactor power is at 75%. Crew must continue power increase to 100%. The 'B' SW pump is tagged out for maintenance.

Event No.	Malf. No.	Event Type*	Event Description
1		R(RO) N(US,BOP)	Normal Power increase in accordance with OS1000.05, "Power Increase"
2	ptMSPT509	I(US,BOP)	Main steam header pressure instrument, PT-507, fails high resulting in an increase of SGFP speed which raises flow/pressure in the main feed lines to all generators.
3	Override RC-PK-455A	I(US,RO)	Master pressure controller, PK-455A, setpoint fails high resulting in PZR pressure control system sensing low PZR pressure. All PZR heaters energize.
4	MFCS017	C(US,RO)	Centrifugal charging pump CS-P-2B trips on overcurrent.
5	MFED019	C(ALL)	Loss of DC bus 11A.
6	MFED0036	C(BOP)	Failure of main generator output breaker to open.
7	MFED038	M(ALL)	Loss of all AC power from loss of offsite power and failure of both EDGs to start.
8	MFRC016	C(US,RO)	Small break LOCA (RCP seal failure). 90gpm leak results from failure of RCP seals during the loss of all AC power.

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