

Facility: Millstone Unit 3			Date of Exam: Week of 01/07/02										Exam Level: RO	
Tier	Group	K/A Category Points											Point Total	
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G		
1.  Emergency & Abnormal  Plant Evolutions	1	3	2	2				3	2			4	16	
	2	5	1	2				4	3			2	17	
	3	0	0	1				1	0			1	3	
	Tier Totals	8	3	5				8	5			7	36	
2.  Plant  Systems	1	3	1	2	4	1	1	4	2	1	1	3	23	
	2	2	1	4	0	1	0	1	5	2	1	3	20	
	3	1	0	0	1	1	1	0	2	0	2	0	8	
	Tier Totals	6	2	6	5	3	2	5	9	3	4	6	51	
3. Generic Knowledge and  Abilities					Cat 1		Cat 2		Cat 3		Cat 4		13	
					4		3		2		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 RO 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.

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

Form ES-401-4

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
000005 Inoperable/Stuck Control Rod / 1		01					Interrelation between rod, controllers, and positioners	2.5/2.5	1
W/E09 Natural Circ. / 4	02						Operational implications of natural circulation EOPs	3.3/3.7	1
000024 Emergency Boration / 1		04					Interrelation between emergency boration and pumps	2.6/2.5	1
000026 Loss of Component Cooling Water / 8						2.4.10	Knowledge of Annunciator Response Procedures	3.0/3.1	1
000027 Pressurizer Pressure Control System Malfunction / 3			03				Reasons for actions contained in the EOP	3.7/4.1	1
000040 Steam Line Rupture - Excessive Heat Transfer / 4	05						Operational implications of the reactivity effects of the cooldown	4.1/4.4	1
W/E08 RCS Overcooling - PTS / 4						2.4.21	Parameters and logic used to assess the status of RCS Integrity safety function	3.7/4.3	1
000051 Loss of Condenser Vacuum / 4						2.4.35	Local Auxiliary Operator tasks during emergency operations.	3.3/3.5	1
000055 Station Blackout / 6	02						Operational implications of natural circulation cooling	4.1/4.4	1
000057 Loss of Vital AC Elec. Inst. Bus / 6					20		Determine interlocks that must be bypassed in order to restore normal equipment operation	3.6/3.9	1
000062 Loss of Nuclear Service Water						2.4.24	Knowledge of loss of cooling water procedures	3.3/3.7	1
000067 Plant Fire On-Site / 9				X			PLANT SPECIFIC Ability to operate CO2 actuation panel	N/A	1
000068 Control Room Evac. / 8					08		Ability to determine and interpret SG pressure	3.9/4.1	1
W/E14 Hi Containment Pressure / 5				03			Operate or monitor for desired operating results	3.3/3.8	1
W/E07 Saturated Core Cooling / 4				03			Operate or monitor for desired operating results	3.5/3.9	1
000076 High Reactor Coolant Activity / 9			05				Knowledge of reasons for corrective actions	2.9/3.6	1
K/A Category Totals:	3	2	2	3	2	4	Group Point Total:		16

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PWR RO Examination Outline  
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

Form ES-401-4

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1	03						Relationship between reactivity and power to rod movement	3.9/4.0	1
003 Dropped Control Rod / 1			06				Reason for resetting the demand counter to zero	2.7/3.0	1
000007 Reactor Trip - Stabilization - Recovery / 1			01				Reasons for actions contained in the EOP	4.0/4.6	1
000009 Small Break LOCA / 3	01						Operational implications of natural circulation cooling	4.2/4.7	1
000011 Large Break LOCA / 3				05			Auto/Manual transfer of charging pump suctions to the borated source	4.3/3.9	1
W/E04 LOCA Outside Containment / 3		02					Proper operation of heat removal systems	3.8/4.0	1
W/E03 LOCA Cooldown/Depress. / 4					02		Adherence to appropriate procedures and operation within facility license	3.5/4.1	1
W/E11 Loss of Emergency Coolant Recirc. / 4					02		Adherence to appropriate procedures and operation within facility license	3.4/4.2	1
000022 Loss of Reactor Coolant Makeup / 2	01						Consequences of thermal shock to RCP seals	2.8/3.2	1
000025 Loss of RHR System / 4				04			Ability to operate or monitor CCW pumps	2.8/2.6	1
UNIT SPECIFIC SBO Diesel Operations					X		PLANT SPECIFIC SBO Diesel Operations	N/A	1
000032 Loss of Source Range NI / 7	01						Effects of voltage changes on performance	2.5/3.1	1
000037 Steam Generator Tube Leak / 3						X	PLANT SPECIFIC SG Tube Leak Procedure	N/A	1
000054 Loss of Main Feedwater / 4						2.4.50	Verify alarm setpoints and operate controls in the alarm response manual	3.3/3.3	1
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4				01			Ability to operate or monitor control and safety systems, interlocks, failure modes, et al	4.1/4.0	1
000060 Accidental Gaseous Radwaste Rel. / 9				02			Ability to operate or monitor the ventilation system	2.9/3.1	1
W/E16 High Containment Radiation / 9	03						Operational implications of conditions associated with high containment radiation	3.0/3.3	1
K/A Category Point Totals:	5	1	2	4	3	2	Group Point Total:		17

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PWR RO Examination Outline  
Emergency and Abnormal Plant Evolutions - Tier 1/Group 3

Form ES-401-4

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
000036 Fuel Handling Accident / 8			02				Reasons for interlocks associated with fuel handling equipment	2.9/3.6	1
000065 Loss of Instrument Air / 8						2.4.11	Knowledge of abnormal condition procedures	3.4/3.6	1
W/E13 Steam Generator Over-pressure / 4				02			Facility operating behavior characteristics	3.0/3.2	1
K/A Category Point Totals:	0	0	1	1	0	1	Group Point Total:		3

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PWR RO Examination Outline  
Plant Systems - Tier 2/Group 1

Form ES-401-4

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Point s
001 Control Rod Drive					64							Reason for shutdown rod withdrawal: SDM	3.3/3.8	1
001 Control Rod Drive									03			Ability to monitor axial imbalance	3.6/3.8	1
003 Reactor Coolant Pump				07								RCP seal design / interlocks	3.2/3.4	1
003 Reactor Coolant Pump										06		Operate / monitor RCP parameters	2.9/2.9	1
003 Reactor Coolant Pump	02											Relationship between RCP and motor cooling	2.6/2.8	1
004 Chemical and Volume Control						27						Effect of loss of RHR suction relief	3.4/3.6	1
004 Chemical and Volume Control											2.1.8	Coordinate activities outside CR	3.8/3.6	1
004 Chemical and Volume Control	10											Relationship bet. CVCS, pneumatic vlvs, RHR	2.7/2.9	1
013 Engineered Safety Features Actuation			02									Effect of a loss of ESFAS on RCS	4.3/4.5	1
013 Engineered Safety Features Actuation							07					Monitor/predict/operate ESF to prevent exceeding CTMT radiation design limits	3.6/3.9	1
013 Engineered Safety Features Actuation				11								Design that provides vital power load control	3.2/3.8	1
015 Nuclear Instrumentation							03					Monitor/predict/operate NIS power indications to prevent exceeding limits	3.7/3.7	1
015 Nuclear Instrumentation								02				Predict impact of faulty detector/compensation	3.1/3.5	1
017 In-core Temperature Monitor							01					Monitor/predict/operate ITM to prevent exceeding core exit temperature limits	3.7/3.9	1
022 Containment Cooling				03								Design features/interlocks for CTMT isol	3.6/4.0	1
022 Containment Cooling											2.1.32	Explain and apply limits / precautions	3.4/3.8	1
059 Main Feedwater			03									Effect of MFW loss or malf on the SGs	3.5/3.7	1
059 Main Feedwater								06				Predict impact/mitigate a loss steam flow	2.7/2.9	1
061 Auxiliary Feedwater		02										Power supply to the electric AFW pumps	3.7/3.7	1
061 Auxiliary Feedwater				06								AFW startup permissives / interlocks	4.0/4.2	1
068 Liquid Radwaste	07											Sources of liquid waste	2.7/2.9	1
071 Waste Gas Disposal											2.3.2	Knowledge of facility ALARA	2.5/2.9	1
072 Area Radiation Monitoring							01					Monitor/predict radiation level changes	3.4/3.6	1
K/A Category Point Totals:	3	1	2	4	1	1	4	2	1	1	3	Group Point Total:		23

ES-401		PWR RO Examination Outline Plant Systems - Tier 2/Group 2										Form ES-401-4		
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant								01				Predict/mitigate impact of loss of inventory	4.3/4.4	1
006 Emergency Core Cooling			02									Effect of loss of ECCS on the fuel	4.3/4.4	1
010 Pressurizer Pressure Control							09					Predict monitor changes in tail pipe temp	3.4/3.7	1
011 Pressurizer Level Control									02			Monitor auto ops including reactor power	2.6/2.8	1
012 Reactor Protection								05				Predict/mitigate impact of faulty detector	3.1/3.2	1
014 Rod Position Indication										02		Operate/monitor mode select switch	3.4/3.2	1
016 Non-nuclear Instrumentation					01							Separation of control and protection circuits	2.7/2.8	1
026 Containment Spray									02			Monitor auto ops of cooling water to HX	3.9/4.2	1
029 Containment Purge								03				Predict impact of startup operations	2.7/3.1	1
033 Spent Fuel Pool Cooling			02									Effect of loss of SFC on radiation monitors	2.8/3.2	1
035 Steam Generator											2.4.31	Knowledge of annunciators and ARPs	3.3/3.4	1
039 Main and Reheat Steam	02											Relationship between MSS and Atm dumps	3.3/3.3	1
055 Condenser Air Removal											2.1.32	Explain/apply system limits/precautions	3.4/3.8	1
062 AC Electrical Distribution											2.4.31	Knowledge of annunciators and ARPs	3.3/3.4	1
063 DC Electrical Distribution	02											Relation between AC and DC Systems	2.7/3.2	1
064 Emergency Diesel Generator		02										Knowledge of fuel oil pump power supply	2.8/3.1	1
073 Process Radiation Monitoring								01				Predict/mitigate impact of failed power sply	2.5/2.9	1
075 Circulating Water			07									Effect of loss of CWS on ESFAS	3.4/3.5	1
079 Station Air								01				Predict/mitigate impact of IAS cross-conn	2.9/3.2	1
086 Fire Protection			01									Effect of loss of FPS on redundant shutdown	2.7/3.2	1
K/A Category Point Totals:	2	1	4	0	1	0	1	5	2	1	3	Group Point Total:		20

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PWR RO Examination Outline  
Plant Systems - Tier 2/Group 3

Form ES-401-4

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal	10											Relationship between RHR and CSS	3.2/3.4	1
007 Pressurizer Relief/Quench Tank								03				Predict/mitigate impact of overpressurization of the pressurizer	3.6/3.9	1
008 Component Cooling Water				07								Operation of CCW swing bus power supply	2.6/2.7	1
028 Hydrogen Recombiner and Purge Control					03							Knowledge of the operational implications of the sources of hydrogen in CTMT	2.9/3.6	1
034 Fuel Handling Equipment								01				Predict/mitigate impact of dropped fuel element	3.6/4.4	1
041 Steam Dump/Turbine Bypass Control						03						Effect of malfunction of controller and positioners, including S/G, CRDS	2.7/2.9	1
076 Service Water										04		Operate or monitor emergency heat loads	3.5/3.5	1
103 Containment										06		Operate or monitor the containment airlock door	2.7/2.9	1
K/A Category Point Totals:	1	0	0	1	1	1	0	2	0	2	0	Group Point Total:		8

## Plant-Specific Priorities

System / Topic	Recommended Replacement for...	Reason	Points
EOP User's Guide	Tier 3, GEN.2.4.39	Specific Millstone 3 rules of EOP usage. RO E-Plan responsibility is limited, and will be tested in Category "A" of the operating test.	1
SBO Diesel Operations	Tier 1 Gp 2, 029.A2.07	SBO Diesel necessary to maintain the core covered during SBO. Selected topic (interpret trip breaker lights), low difficulty, low discriminatory validity.	1
New SG Tube Leak Procedure	Tier 1 Gp 2, 037.K1.01	New SG Tube Leak procedure issued at Millstone 3	1
CO2 Actuation Panel	Tier 1 Gp 1, 067.K3.07	Millstone 3 CO2 Panel operation has greater operational impact than operation of the fire alarm reset panel.	1
Plant-Specific Priority Total: (limit 10)			4

Facility:		Date of Exam:01/07/02		Exam Level: <b>RO</b>	
Category	K/A #	Topic	Imp.	Points	
Conduct of Operations	2.1.3	Knowledge of shift turnover practices	3.0	1	
	2.1.14	System status criteria which require notification of plant personnel	2.5	1	
	2.1.22	Ability to determine Mode of Operation	2.8	1	
	2.1.25	Ability to interpret reference materials, such as graphs and tables	2.8	1	
	Total			4	
Equipment Control	2.2.2	Ability to manipulate the console controls as required to operate between shutdown and designated power levels	4.0	1	
	2.2.33	Knowledge of control rod programming	2.5	1	
	2.2.34	Knowledge of the process for determining the internal and external effects on core reactivity	2.8	1	
	Total			3	
Radiation Control	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			2	
Emergency Procedures and Plan	2.4.12	Knowledge of general operating crew responsibilities during emergency operations	3.4	1	
	2.4.27	Knowledge of fire in the plant procedures	3.0	1	
	2.4.50	Ability to verify system alarm setpoints and operate controls identified in the alarm response manual	3.3	1	
	Plant	Knowledge of Millstone 3 EOP User's Guide	N/A	1	
	Total			4	
Tier 1 Target Point Total (RO/SRO)				13	



Facility: Millstone Unit 3				Date of Exam: Week of 1/07/02				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	3	2				5	3			6	24
	2	5	0	2				3	3			3	16
	3	1	0	1				1	0			0	3
	Tier Totals	11	3	5				9	6			9	43
2.  Plant Systems	1	1	1	2	3	1	1	3	1	2	2	2	19
	2	1	1	2	0	1	0	1	6	1	1	3	17
	3	1	0	0	1	0	1	0	0	0	1	0	4
	Tier Totals	3	2	4	4	2	2	4	7	3	4	5	40
3. Generic Knowledge and  Abilities				Cat 1		Cat 2		Cat 3		Cat 4		17	
				5		6		2		4			
<p>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).</p> <p>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 exam must total 100 points.</p> <p>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.</p> <p>4. Systems/evolutions within each group are identified on the associated outline.</p> <p>5. The shaded areas are not applicable to the category/tier.</p> <p>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.</p> <p>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.</p>													

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

Form ES-401-4

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1	03						Relationship between reactivity and power to rod movement	4.0	1
000003 Dropped Control Rod / 1			06				Reason for resetting demand position counter to zero	3.0	1
000005 Inoperable/Stuck Control Rod / 1		01					Interrelation between rod, controllers, and positioners	2.5	1
000005 Inoperable/Stuck Control Rod / 1						2.1.12	Ability to apply technical specifications for a system	4.0	1
000011 Large Break LOCA / 3				05			Auto/Manual transfer of charging pump suctions	3.9	1
W/E04 LOCA Outside Containment / 3		02					Proper operation of heat removal systems	4.0	1
000015/17 RCP Malfunctions / 4				06			Operate / monitor CCWS	2.9	1
W/E09 Natural Circ. / 4	02						Operational implications of natural circulation EOPs	3.7	1
000024 Emergency Boration / 1		04					Interrelation between emergency boration and pumps	2.5	1
000026 Loss of Component Cooling Water / 8						2.2.22	Knowledge of LCOs and safety limits	4.1	1
000026 Loss of Component Cooling Water / 8						2.4.10	Knowledge of Annunciator Response Procedures	3.1	1
PLANT SPECIFIC SBO Diesel Operations					X		PLANT SPECIFIC SBO Diesel Operations	N/A	1
000040 Steam Line Rupture - Excessive Heat Transfer / 4	05						Op. implications of reactivity effects of the cooldown	4.4	1
W/E08 RCS Overcooling - PTS / 4						2.4.21	Parameters and logic used to assess the status of RCS Integrity Safety Function	4.3	1
000051 Loss of Condenser Vacuum / 4						2.4.35	Local AO tasks during emergency operations	3.5	1
000055 Station Blackout / 6	02						Operational implications of natural circulation cooling	4.4	1
000057 Loss of Vital AC Elec. Inst. Bus / 6					20		Determine interlocks that must be bypassed in order to restore normal equipment operation	3.9	1
000059 Accidental Liquid Rad Waste Rel. / 9	03						Effects of placing a source near a liquid rad monitor	2.9	1
000062 Loss of Nuclear Service Water / 4						2.4.24	Knowledge of loss of cooling water procedures	3.7	1
000067 Plant Fire On-Site / 9				X			PLANT SPECIFIC Ability to operate CO2 actuation panel	N/A	1
000068 Control Room Evac. / 8					08		Ability to determine and interpret SG pressure	4.1	1
W/E14 Hi Containment Pressure / 5				03			Operate or monitor for desired operating results	3.8	1
W/E07 Saturated Core Cooling / 4				03			Operate or monitor for desired operating results	3.9	1
000076 High Reactor Coolant Activity / 9			05				Knowledge of reasons for corrective actions	3.6	1
K/A Category Totals:	5	3	2	5	3	6	Group Point Total:		24

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PWR SRO Examination Outline  
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

Form ES-401-4

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
000007 Reactor Trip - Stabilization - Recovery / 1			01				Reasons for actions contained in the EOP	4.6	1
000009 Small Break LOCA / 3	01						Operational implications of natural circ cooling	4.7	1
W/E03 LOCA Cooldown/Depress. / 4					02		Adherence to appropriate procedures and operation within facility license	4.1	1
W/E11 Loss of Emergency Coolant Recirc. / 4					02		Adherence to appropriate procedures and operation within facility license	4.2	1
000022 Loss of Reactor Coolant Makeup / 2	01						Consequences of thermal shock to RCP seals	3.2	1
000025 Loss of RHR System / 4				04			Ability to operate or monitor CCW pumps	2.6	1
000027 Pressurizer Pressure Control System Malfunction / 3			03				Reasons for actions contained in the EOP	4.1	1
000032 Loss of Source Range NI / 7	01						Effects of voltage changes on performance	3.1	1
000033 Loss of Intermediate Range NI / 7	01						Effects of voltage changes on performance	3.0	1
000037 Steam Generator Tube Leak / 3						X	PLANT SPECIFIC Tube Leak Procedure	N/A	1
000054 Loss of Main Feedwater / 4						2.4.50	Verify alarm setpoints and operate controls in the alarm response manual	3.3	1
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4				01			Ability to operate or monitor control and safety systems, interlocks, failure modes, et al	4.0	1
000058 Loss of DC Power / 6					01		Determine a loss of DC has occurred; verify substitute power sources have come on line	4.1	1
000060 Accidental Gaseous Rad waste Rel. / 9				02			Ability to operate or monitor the ventilation system	3.1	1
W/E16 High Containment Radiation / 9	03						Operational implications of conditions associated with high containment radiation	3.3	1
000065 Loss of Instrument Air / 8						2.4.11	Knowledge of abnormal condition procedures	3.6	1
K/A Category Point Totals:	5	0	2	3	3	3	Group Point Total:		16

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PWR SRO Examination Outline  
Emergency and Abnormal Plant Evolutions - Tier 1/Group 3

Form ES-401-4

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
000036 Fuel Handling Accident / 8			02				Reasons for interlocks associated with fuel handling equipment	3.6	1
000056 Loss of Off-site Power / 6	01						Operational implications of the principle of cooling by natural convection	4.2	1
W/E13 Steam Generator Over-pressure / 4				02			Facility operating behavior characteristics	3.2	1
K/A Category Point Totals:	1	0	1	1	0	0	Group Point Total:		3

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PWR SRO Examination Outline  
Plant Systems - Tier 2/Group 1

Form ES-401-4

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive					64							Reason for shutdown rod withdrawal: SDM	3.8	1
001 Control Rod Drive									03			Ability to monitor axial imbalance	3.8	1
003 Reactor Coolant Pump										06		Operate / Monitor RCP parameters	2.9	1
003 Reactor Coolant Pump				07								RCP seal design / interlocks	3.4	1
004 Chemical and Volume Control						27						Effect of loss of RHR suction relief	3.6	1
004 Chemical and Volume Control											2.1.8	Coordinate activities outside CR	3.6	1
013 Engineered Safety Features Actuation							07					Monitor/predict/operate ESF to prevent exceeding CTMT radiation design limits	3.9	1
013 Engineered Safety Features Actuation			02									Effect of a loss of ESFAS on RCS	4.5	1
014 Rod Position Indication										02		Operate/monitor mode select switch	3.2	1
015 Nuclear Instrumentation							03					Monitor/predict/operate NIS power indications to prevent exceeding limits	3.7	1
017 In-core Temperature Monitor							01					Monitor/predict/operate ITM to prevent exceeding core exit temperature limits	3.9	1
022 Containment Cooling				03								Design features/interlocks for CTMT isol	4.0	1
026 Containment Spray									02			Monitor auto ops of cooling water to HX	4.2	1
059 Main Feedwater			03									Effect of MFW loss or malf on the SGs	3.7	1
061 Auxiliary Feedwater		02										Power supply to the electric AFW pumps	3.7	1
061 Auxiliary Feedwater				06								AFW startup permissives / interlocks	4.2	1
063 DC Electrical Distribution	02											Relationship between AC and DC Systems	3.2	1
068 Liquid Radwaste								02				Predict impact/mitigate lack of tank recirc prior to discharge	2.8	1
071 Waste Gas Disposal											2.3.2	Knowledge of facility ALARA	2.9	1
K/A Category Point Totals:	1	1	2	3	1	1	3	1	2	2	2	Group Point Total:		19

ES-401

PWR SRO Examination Outline  
Plant Systems - Tier 2/Group 2

Form ES-401-4

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant								01				Predict/mitigate impact of loss of inventory	4.4	1
006 Emergency Core Cooling			02									Effect of loss of ECCS on the fuel	4.4	1
010 Pressurizer Pressure Control							09					Predict monitor changes in tail pipe temp	3.7	1
011 Pressurizer Level Control									02			Monitor auto ops including reactor power	2.8	1
012 Reactor Protection								05				Predict/mitigate impact of faulty detector	3.2	1
016 Non-nuclear Instrumentation					01							Separation of control and protection circuits	2.8	1
029 Containment Purge								03				Predict impact of startup operations	3.1	1
034 Fuel Handling Equipment								01				Predict/mitigate impact of dropped fuel element	4.4	1
035 Steam Generator											2.4.31	Knowledge of annunciators and ARPs	3.4	1
039 Main and Reheat Steam	02											Relationship between MSS and Atm Dumps	3.3	1
055 Condenser Air Removal											2.1.32	Explain/apply system limits/precautions	3.8	1
062 AC Electrical Distribution											2.4.41	Knowledge of EAL classifications	4.1	1
064 Emergency Diesel Generator		02										Knowledge of fuel oil pump power supply	3.1	1
073 Process Radiation Monitoring								01				Predict/mitigate impact of failed power sply	2.9	1
079 Station Air								01				Predict/mitigate impact of IAS cross-conn	3.2	1
086 Fire Protection			01									Effect of loss of FPS on redundant shutdown	3.2	1
103 Containment										06		Operate or monitor the containment airlock door	2.9	1
K/A Category Point Totals:	1	1	2	0	1	0	1	6	1	1	3	Group Point Total:		17

ES-401		PWR SRO Examination Outline Plant Systems - Tier 2/Group 3										Form ES-401-4		
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal	10											Relationship between RHR and CSS	3.4	1
008 Component Cooling Water				07								Operation of CCW swing bus power supply	2.7	1
041 Steam Dump/Turbine Bypass Control						03						Effect of malfunction of controller and positioners, including S/G, CRDS	2.9	1
076 Service Water										04		Operate or monitor emergency heat loads	3.5	1
K/A Category Point Totals:	1	0	0	1	0	1	0	0	0	1	0	Group Point Total:		4

**Plant-Specific Priorities**

System / Topic	Recommended Replacement for...	Reason	Points
EOP User's Guide	Tier 3, GEN.2.4.39	Specific Millstone 3 rules of EOP usage. RO E-Plan responsibility is limited, and will be tested in Category "A" of the operating test.	1
SBO Diesel Operations	Tier 1 Gp 2, 029.A2.07	SBO Diesel necessary to maintain the core covered during SBO. Selected topic (interpret trip breaker lights), low difficulty, low discriminatory validity.	1
New SG Tube Leak Procedure	Tier 1 Gp 2, 037.K1.01	New SG Tube Leak procedure issued at Millstone 3	1
CO2 Actuation Panel	Tier 1 Gp 1, 067.K3.07	Millstone 3 CO2 Panel operation has greater operational impact than operation of the fire alarm reset panel.	1
Plant-Specific Priority Total: (limit 10)			4

Facility: Millstone Unit 3		Date of Exam: Week of 01/07/02		Exam Level: SRO	
Category	K/A #	Topic	Imp.	Points	
	2.1.4	Knowledge of shift staffing requirements	3.4	1	
Conduct of Operations	2.1.7	Evaluate plant performance and make operational judgements	4.4	1	
	2.1.10	Knowledge of conditions and limits on the facility license	3.9	1	
	2.1.11	Knowledge of less than one hour tech spec action statements	3.8	1	
	2.1.14	System status criteria which require notification of plant personnel	3.3	1	
	Total			5	
Equipment Control	2.2.2	Ability to manipulate the console controls as required to operate between shutdown and designated power levels	3.5	1	
	2.2.11	Knowledge of the process for controlling temporary changes	3.4	1	
	2.2.24	Analyze the effect of maintenance activities on LCO status	3.8	1	
	2.2.27	Knowledge of the refueling process	3.5	1	
	2.2.29	Knowledge of SRO fuel handling responsibilities	3.8	1	
	2.2.32	Knowledge of the effects of alterations on core configuration	3.3	1	
Total			6		
Radiation Control	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	
	Total			2	
Emergency Procedures and Plan	2.4.11	Knowledge of abnormal condition procedures	3.6	1	
	2.4.29	Knowledge of the emergency plan	4.0	1	
	2.4.30	Knowledge of which events should be reported to outside agencies	3.6	1	
	Plant	Knowledge of Millstone 3 EOP User's Guide	N/A	1	
	Total			4	
Tier 1 Target Point Total (SRO)				17	



## Description of the Process Used to Develop the Millstone 3 Exam Outline

- I. Obtained copies of Forms ES-401.3 and 4, *PWR SRO and RO Examination Outlines*, and Form ES-401.5 *Generic Knowledge and Abilities Outline (Tier 3)*.
- II. Used the *Example Systematic Sampling Methodology* per ES-401, Attachment 1 to select the topics for the RO exam as follows:
  - A. Deleted all systems not applicable to Millstone 3 (BW & CE Evolutions, and the Ice Condenser).
  - B. Selected the topics for use on the exam by randomly selecting tokens.
  - C. If a group had more topics than required questions for a Tier / Group, tokens were then selected to randomly remove the topics that would not be covered.
  - D. If a group had less topics than required questions for a Tier / Group, each topic was selected once, and tokens were selected to randomly add topics that would receive double question coverage.
- III. Used the *Example Systematic Sampling Methodology* per ES-401, Attachment 1 to select the K/A categories for the RO exam for each topic.
- IV. Used the *Example Systematic Sampling Methodology* per ES-401, Attachment 1 to select the individual K/A statements for the RO exam as follows:
  - A. Any individual K/A statement with an importance rating of  $< 2.5$  was eliminated prior to selection.
  - B. If a K/A category had no importance ratings of  $\geq 2.5$ , another K/A category was randomly selected.
  - C. Prior to randomly selecting the individual K/A statement for Tier 1 and 2 "Generic" category, K/A statements not relevant to the K/A topic were removed.
  - D. For Tier 3, six tokens were selected in the 2.3 Radiation Control area. Since only six K/A statements in this area had importance values of 2.5 or above, all of them were selected.
- V. Verified each K/A category for the RO exam had at least 2 points in each tier. No changes required.
- VI. Adopted the SRO outline from the RO outline as follows:
  - A. Carried over all common topics to the SRO outline.
  - B. Used the *Example Systematic Sampling Methodology* per ES-401, Attachment 1 to select / remove the topics for the SRO exam that differed from the RO exam.
  - C. Changed one SRO K/A statement to another that had been randomly selected on the RO exam to ensure each category for the SRO exam had at least 2 points in each tier.

## Description of the Process Used to Develop the Millstone 3 Exam Outline

- D. Observed that the random process did not select 25 K/A statements that tested at the SRO level. Discussed this with lead examiner, and randomly selected more SRO specific generic topics. These topics replaced the RO Generic K/As, and were then applied to existing randomly selected systems.
- VII. Added plant specific topics to the outlines, substituting them for areas of lowest discriminatory validity.
- VIII. Rejected/reselected K/As that were N/A Millstone 3, or were deemed inappropriate to the written exam format.
- IX. Checked for exam balance, and noted that the exam is unbalanced toward Radiation Control (6 questions), Containment barrier (5 questions), and Fire Protection (5 questions). Replaced per "Rejected K/A Record".
- X. Based on lead examiner outline review feedback (telephone call, 11-8-01), two K/As were replaced. Tier 1, Group 3 GEN.2.1.30, which was oriented toward PEO knowledge, and Tier 3, Group 1 GEN.2.1.17, which is better tested on the simulator. Search was limited to K/As in the pre-selected K/A category that were deemed more appropriate than the rejected K/As, and tokens redrawn. For GEN.2.1.30, only one topic was deemed separate from the related simulator session, and that topic was used.
- XI. Based on Manager Review, replaced SRO Tier 3, Group 2 GEN.2.2.8 (Not part of SRO job at Millstone 3) with GEN 2.2.2, which had already been randomly selected for the RO exam.
- XII. Based on NRC feedback during the exam validation week, it was determined that the Radiation Monitor (RMS) area had been oversampled. Several other questions were also rated as UNSAT. These questions were dealt with in 3 ways.
  - 1. The questions were modified to restore them to a satisfactory condition.
  - 2. The questions were replaced with approved questions from the SRO/RO exam that were previously used only on one of the exams. These topics had already been randomly selected for one of the exams, and were now applied to both exams.
  - 3. New K/A statements were randomly selected from the same K/A categories, where applicable, or new K/A Topics were randomly selected to replace either the oversampled RMS area.

Tier / Group	Randomly Selected K/A	Reason for Rejection
1/1	005.K2.03	Not Applicable Millstone 3. No "Metroscope"
1/1	002.K3.02	Not Applicable Millstone 3. No Flow Chart Transmitter shifted
1/1	055.K1.01	Low discriminatory validity. Battery discharge rate effect on battery capacity
1/1	076.A1.04	Poor topic for testing on written exam (Monitor/operate failed fuel monitor)
1/1 (SRO)	003.AK3.03	Not Applicable Millstone 3. No Automatic Turbine Runback on Dropped Rod
1/2	060.AK1.04	Not part of RO job at Millstone 3
1/2 (SRO)	058.A2.02	Low discriminatory validity. Interpret low DC Bus Voltage alarm.
2/1	013.K3.03	Over-sample of Containment barrier. Kept same randomly selected K3 K/A Category, replaced Containment with fuel clad barrier.
2/1 (SRO)	004.GEN.2.1.8	Replaced with remaining RO exam CVCS K/A 004.K6.27 to meet minimum K6 topics in Tier 2.
2/2	006.K3.03	Over-sample of Containment barrier. Kept same randomly selected K3 K/A Category, replaced Containment with RCS.
2/2	010.K2.02	Over-sampled power supplies. Low discriminatory validity.
2/2	028.A4.02	Poor topic for testing on written exam, low operational validity (Locate/interpret CTMT pressure indicator during H2 Recombiner Operations) Recombiners are started several days into the event. and have minimal impact on CTMT pressure, unless a hydrogen burn occurs, in which case Tech Support will have been staffed up, and the crews will be out of the EOP space, maybe in SAMGs.
2/2	075.K2.02	Over-sampled power supplies. Low discriminatory validity.
2/3	041.K2.	Not Applicable Millstone 3. No ICS.
3/2	GEN.2.2.14	Similar to already selected KAs 2.2.8 and 2.2.11
3/3	GEN.2.3.1	Over-sampled Radiation Control area
3/3	GEN.2.3.2	Over-sampled Radiation Control area
3/3	GEN.2.3.9	Over-sampled Radiation Control area
3/3	GEN.2.3.11	Over-sampled Radiation Control area
3/4	GEN.2.4.26	Over-sampled Fire Protection area
3/4	GEN.2.4.38	RO E-Plan actions, overlaps with Admin JPM portion of the exam.
2/2	063.A1.01	Low discriminatory validity. Battery discharge rate effect on battery capacity
1/3	GEN.2.1.30	Rejected based on Chief Examiner comment from outline review. K/A was oriented toward PEO knowledge.
3/1	GEN.2.1.17	Rejected based on Chief Examiner comment from outline review. K/A is better tested on the simulator.
3/2 (SRO)	GEN.2.2.8	Rejected based on Facility Reviewer comment. Not part of SRO job at Millstone 3

Tier / Group	Randomly Selected K/A	Reason for Rejection
1/2 (RO) 1/1 (SRO)	W/E02.K3.01	Question rated "Unsat" during NRC examiner review. Replaced question with previously existing questions from RO/SRO exam that previously were on only one of the exams.
2/1	056.A2.04	Based on NRC examiner review comment, judged as low discriminatory validity.
2/1	068.A2.04	Based on NRC examiner review comment, oversampled RMS area
2/1	071.K4.06	Based on NRC examiner review comment, oversampled RMS area
2/1	072.GEN.2.1.28	Based on NRC examiner review comment, oversampled RMS area
2/1	072.GEN.2.2.25	Based on NRC examiner review comment, oversampled RMS area
2/2	029.A2.01	Based on NRC examiner review comment, oversampled RMS area
2/2	039.K1.09	Based on NRC examiner review comment, oversampled RMS area
2/3	007.A2.05	Based on NRC examiner review comment, low discriminatory validity
3/1	GEN.2.1.21	Based on NRC examiner review comment, topic better tested on walkthrough portion of exam.