OUTLINE

FOR THE PRAIRIE ISLAND INITIAL EXAMINATION - AUGUST 2002

ES-201 | Examination Outline Quality Checklist | Form ES-201-2 (R8,S1)

Facility: | Date of Examination:

Item	Task Description	Initials a	b*	c#
1. WRITTEN	a. Verify that the outline(s) fit(s) the appropriate model per ES-401.			
	b. Assess whether the outline was systematically and randomly prepared in accordance with Section D.1 of ES-401 and whether all K/A categories are appropriately sampled.			
	c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics.			
	d. Assess whether the justifications for deselected or rejected K/A statements are appropriate.			
2. SIM	a. Using Form ES-301-5, verify that the proposed scenario sets cover the required number of normal evolutions, instrument and component failures, and major transients.			
	b. Assess whether there are enough scenario sets (and spares) to test the projected number and mix of applicants in accordance with the expected crew composition and rotation schedule without compromising exam integrity; ensure each applicant can be tested using at least one new or significantly modified scenario, that no scenarios are duplicated from the applicants' audit test(s)*, and scenarios will not be repeated over successive days.			
	c. To the extent possible, assess whether the outline(s) conform(s) with the qualitative and quantitative criteria specified on Form ES-301-4 and described in Appendix D.			
3. W / T	a. Verify that: (1) the outline(s) contain(s) the required number of control room and in-plant tasks, (2) no more than 30% of the test material is repeated from the last NRC examination; (3)* no tasks are duplicated from the applicants' audit test(s), and (4) no more than 80% of any operating test is taken directly from the licensee's exam banks.			
	b. Verify that: (1) the tasks are distributed among the safety function groupings as specified in ES-301, (2) one task is conducted in a low-power or shutdown condition, (3) 40% of the tasks require the applicant to implement an alternate path procedure, (4) one in-plant task tests the applicant's response to an emergency or abnormal condition, and (5) the in-plant walk-through requires the applicant to enter the RCA.			
	c. Verify that the required administrative topics are covered, with emphasis on performance-based activities.			
	d. Determine if there are enough different outlines to test the projected number and mix of applicants and ensure that no items are duplicated on successive days.			
4. GENERAL	a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam section.			
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.			
	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.			
	d. Check for duplication and overlap among exam sections.			
	e. Check the entire exam for balance of coverage.			
	f. Assess whether the exam fits the appropriate job level (RO or SRO).			

	Printed Name / Signature	Date
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Note: * Not applicable for NRC-developed examinations. LET - licensing examiner trainee
Independent NRC reviewer initial items in Column "c;" chief examiner concurrence required.

Facility: Prairie Island Date of Exam: 08/12/02 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	2	1	3				3	4			3	16
	2	3	3	3				3	2			3	17
	3	1	1	0				0	0			1	3
	Tier Totals	6	5	6				6	6			7	36
2. Plant Systems	1	2	2	2	2	3	2	3	2	2	2	1	23
	2	3	1	2	3	1	1	1	3	2	1	2	20
	3	1	0	1	1	1	0	1	0	1	1	1	8
	Tier Totals	6	3	5	6	5	3	5	5	5	4	4	51
3. Generic Knowledge and Abilities		Cat 1			Cat 2			Cat 3			Cat 4		13
		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 ±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 Emergency and Abnormal Plant Evolutions - Tier 1/Group 1							Form ES-401-4 (R8, S1)
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000005 Inoperable/Stuck Control Rod / 1				X			AA1.04 Reactor and turbine power	3.9/3.9	1
000015/17 RCP Malfunctions / 4					X		AA2.10 When to secure RCPs on loss of cooling or seal injection	3.7/3.7	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4						X	2.4.7 Knowledge of event based EOP mitigation strategies	3.1/3.8	1
000024 Emergency Boration / 1	X						AK1.04 Low temperature limits for boron concentration	2.8/3.6	1
000026 Loss of Component Cooling Water / 8					X		AA2.02 The cause of possible CCW loss	2.9/3.6	1
000027 Pressurizer Pressure Control System Malfunction / 3			X				AK3.03 Actions contained in EOP for PZR PCS malfunction	3.7/4.1	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4				X			EA1.3 Desired operating results during abnormal and emergency conditions	3.4/3.9	1
CE/A11; W/E08 RCS Overcooling - PTS / 4					X		EA2.1 Facility conditions and selection of appropriate procedures during abnormal and emergency operations	3.4/4.2	1
000051 Loss of Condenser Vacuum / 4						X	2.1.32 Ability to explain and apply all system limits and precautions	3.4/3.8	1
000055 Station Blackout / 6	X						EK1.02 Natural circulation cooling	4.1/4.4	1
000057 Loss of Vital AC Elec. Inst. Bus / 6			X				AK3.01 Actions contained in EOP for loss of vital ac electrical instrument bus	4.1/4.4	1
000062 Loss of Nuclear Service Water / 4			X				AK3.02 The automatic actions (alignments) within the nuclear service water resulting from the actuation of the ESFAS	3.6/3.9	1
000067 Plant Fire On-site / 9				X			AA1.07 Fire alarm reset panel	2.9/3.0	1
000069 (W/E14) Loss of CTMT Integrity / 5					X		EA2.2 Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.3/3.8	1
000074 (W/E06&E07) Inad. Core Cooling / 4						X	2.4.6 Knowlege of symptom based EOP mitigation strategies	3.1/4.0	1
000076 High Reactor Coolant Activity / 9		X					AK2.01 Process radiation monitors	2.6/3.0	1
K/A Category Totals:	2	1	3	3	4	3	Group Point Total:		16

ES-401	PWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2							Form ES-401-4 (R8, S1)
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1						X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	4.0/4.3	1
000003 Dropped Control Rod / 1	X						AK1.16 MTC	2.9/3.2	1
000008 Pressurizer Vapor Space Accident / 3		X					AK2.02 Sensors and detectors	2.7/2.7	1
000009 Small Break LOCA / 3			X				EK3.28 Manual ESFAS initiation requirements	4.5/4.5	1
W/E04 LOCA Outside Containment / 3				X			EA1.3 Desired operating results during abnormal and emergency situations	3.8/4.0	1
BW/E08; W/E03 LOCA Cooldown/Depress. / 4					X		EA2.2 Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.5/4.1	1
W/E11 Loss of Emergency Coolant Recirc. / 4						X	2.1.2 Knowledge of operator responsibilities during all modes of plant operation	3.0/4.0	1
000022 Loss of Reactor Coolant Makeup / 2	X						AK1.01 Consequences of thermal shock to RCP seals	2.8/3.2	1
000025 Loss of RHR System / 4		X					AK2.01 RHR heat exchangers	2.9/2.9	1
000033 Loss of Intermediate Range NI / 7			X				AK3.01 Termination of startup following loss of intermediate rannge instrumentation	3.2/3.6	1
000037 Steam Generator Tube Leak / 3				X			AA1.11 PZR level indicator	3.4/3.3	1
000038 Steam Generator Tube Rupture / 3					X		EA2.13 Magnitude of rupture	3.1/3.7	1
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4						X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	4.0/4.3	1
000059 Accidental Liquid RadWaste Rel. / 9	X						AK1.01 Types of radiation, their units of intensity and the location of the sources of radiation in a nuclear power plant	2.7/3.1	1
000060 Accidental Gaseous Radwaste Rel. / 9		X					AK2.02 Auxiliary building ventilation system	2.7/3.1	1
000061 ARM System Alarms / 7			X				AK3.02 Guidance contained in alarm response for ARM system	3.4/3.6	1
W/E16 High Containment Radiation / 9				X			EA1.3 Desired operating results during abnormal and emergency situations	2.9/3.3	1
K/A Category Point Totals:	3	3	3	3	2	3	Group Point Total:		17

ES-401	PWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 3							Form ES-401-4 (R8, S1)
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000065 Loss of Instrument Air / 8						X	2.4.2 Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions	3.9/4.1	1
W/E13 Steam Generator Over-pressure / 4	X						EK1.2 Normal, abnormal and emergency operating procedures associated with (Steam Generator Overpressure)	3.0/3.3	1
W/E15 Containment Flooding / 5		X					EK2.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	2.8/2.9	1
K/A Category Point Totals:	1	1	0	0	0	1	Group Point Total:		3

ES-401	PWR RO Examination Outline Plant Systems - Tier 2/Group 1											Form ES-401-4 (R8, S1)		
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								K1.04 RCS	3.3/3.4	2
												K4.07 Rod stops	3.7/3.8	
003 Reactor Coolant Pump		X			X							K2.02 CCW pumps	2.5/2.6	2
												K5.04 Effects of RCP shutdown on secondary parameters, such as steam pressure, steam flow, and feed flow	3.2/3.5	
004 Chemical and Volume Control			X			X						K3.08 RCP seal injection	3.6/3.8	2
												K6.13 Purpose and function of the boration/dilution batch controller	3.1/3.3	
013 Engineered Safety Features Actuation				X			X					K4.13 MFW isolation/reset	3.7/3.9	2
												A1.06 RWST level	3.6/3.9	
015 Nuclear Instrumentation		X			X							K2.01 NIS channels, components, and interconnections	3.3/3.7	2
												K5.02 Discrimination/compensation operation	2.7/2.9	
017 In-core Temperature Monitor						X						K6.01 Sensors and detectors	2.7/3.0	1
022 Containment Cooling							X					A1.01 Containment temperature	3.6/3.7	1
056 Condensate								X				A2.04 Loss of condensate pumps	2.6/2.8	1
059 Main Feedwater							X		X			A1.03 Power level restrictions for operation of MFW pumps and valves	2.7/2.9	2
												A3.06 Feedwater isolation	3.2/3.3	
061 Auxiliary/Emergency Feedwater								X		X		K4.07 Turbine trip, including overspeed	3.1/3.3	2
												A2.05 Automatic control malfunction	3.1/3.4	
068 Liquid Radwaste	X								X			K1.02 Waste Gas Vent Header	2.5/2.6	2
												A3.02 Automatic isolation	3.6/3.6	

ES-401	PWR RO Examination Outline Plant Systems - Tier 2/Group 1												Form ES-401-4 (R8, S1)	
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
071 Waste Gas Disposal					X					X		K5.04 Relationship of hydrogen/oxygen concentrations to flammability	2.5/3.1	2
												A4.30 Water drainage from the WGDS decay tanks	2.9/2.6	
072 Area Radiation Monitoring			X								X	K3.02 Fuel handling operations	3.1/3.5	2
												2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	4.0/4.3	
K/A Category Point Totals:	2	2	2	2	3	2	3	2	2	2	1	Group Point Total:		23

ES-401	PWR RO Examination Outline Plant Systems - Tier 2/Group 2											Form ES-401-4 (R8, S1)		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant	X											K1.07 Reactor vessel level indication system	3.5/3.7	1
006 Emergency Core Cooling		X										K2.01 ECCS pumps	3.6/3.9	1
010 Pressurizer Pressure Control			X									K3.01 RCS	3.9/3.9	1
011 Pressurizer Level Control				X								K4.02 PZR level controller	3.3/3.4	1
012 Reactor Protection					X							K5.01 DNB	3.3/3.8	1
014 Rod Position Indication				X								K4.06 Individual and group misalignment	3.4/3.7	1
016 Non-nuclear Instrumentation								X				A2.02 Loss of power supply	2.9/3.2	1
026 Containment Spray								X				A2.05 Failure of chemical addition tanks to inject	3.7/4.1	1
029 Containment Purge									X			A3.01 CPS isolation	3.8/4.1	1
033 Spent Fuel Pool Cooling											X	2.1.27 Knowledge of system purpose and or function	2.8/2.9	1
035 Steam Generator										X		A4.05 Level control to enhance natural circulation	3.8/4.0	1
039 Main and Reheat Steam	X											K1.02 Atmospheric relief dump valves	3.3/3.3	1
055 Condenser Air Removal	X											K1.06 PRM system	2.6/2.6	1
062 AC Electrical Distribution			X									K3.03 DC system	3.7/3.9	1
063 DC Electrical Distribution				X								K4.04 Trips	2.6/2.9	1
064 Emergency Diesel Generator						X						K6.07 Air receivers	2.7/2.9	1
073 Process Radiation Monitoring							X					A1.01 Radiation levels	3.2/3.5	1
075 Circulating Water											X	2.4.31 Knowledge of annunciator alarms and indications, and use of the response instructions	3.3/3.4	1
079 Station Air								X				A2.01 Cross-connection with IAS	2.9/3.2	1
086 Fire Protection									X			A3.01 Starting mechanisms of fire water pumps	2.9/3.3	1
K/A Category Point Totals:	3	1	2	3	1	1	1	3	2	1	2	Group Point Total:		20

ES-401	PWR RO Examination Outline Plant Systems - Tier 2/Group 3	Form ES-401-4 (R8, S1)

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	3.4/3.1	1
027 Containment Iodine Removal											X	2.1.32 Ability to explain and apply all system limits and precautions	3.4/3.8	1
028 Hydrogen Recombiner and Purge Control					X							K5.03 Sources of hydrogen within containment	2.9/3.6	1
034 Fuel Handling Equipment							X					A1.02 Water level in the refueling canal	2.9/3.7	1
041 Steam Dump/Turbine Bypass Control			X									K3.02 RCS	3.8/3.9	1
076 Service Water				X								K4.02 Automatic start features associated with SWS pump controls	2.9/3.2	1
078 Instrument Air									X			A3.01 Air pressure	3.1/3.2	1
103 Containment	X											K1.03 Shield building vent system	3.1/3.5	1
K/A Category Point Totals:	1	0	1	1	1	0	1	0	1	1	1	Group Point Total:		8

Plant-Specific Priorities

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

Facility: Prairie Island		Date of Exam: 08/12/02		Exam Level: RO
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.1	Knowledge of conduct of operations requirements	3.7/3.8	1
	2.1.3	Knowledge of shift turnover practices	3.0/3.4	1
	2.1.29	Knowledge of how to conduct and verify valve lineups	3.4/3.3	1
	Total			3
Equipment Control	2.2.12	Knowledge of surveillance procedures	3.0/3.4	1
	2.2.13	Knowledge of tagging and clearance procedures	3.6/3.8	1
	2.2.30	Knowledge of RO duties in the control room during fuel handling such as alarm from fuel handling area, communication with fuel storage facility, systems operated from the control board in support of fueling operations, and supporting instrumentation	3.5/3.3	1
	Total			3
Radiation Control	2.3.1	Knowledge of 10CFR: 20 and related facility radiation control	2.6/3.0	1
	2.3.2	Knowledge of facility ALARA program	2.5/2.9	1
	2.3.11	Ability to control radiation releases	2.7/3.2	1
	Total			3
Emergency Procedures/ Plan	2.4.2	Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions	4.3/4.6	1
	2.4.6	Knowledge of symptom based EOP mitigation strategies	3.1/4.0	1
	2.4.11	Knowledge of abnormal condition procedures	3.4/3.6	1
	2.4.20	Knowledge of operational implications of EOP warnings, cautions, and notes	3.3/4.0	1
	Total			4
Tier 3 Point Total (RO/SRO)				13

Facility: Date of Exam: 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	A2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	3	3	4				4	6			4	24
	2	2	3	2				2	4			3	16
	3	0	0	1				1	1			0	3
	Tier Totals	5	6	7				7	11			7	43
2. Plant Systems	1	2	2	1	2	1	2	2	2	2	2	1	19
	2	2	1	2	1	2	1	2	2	2	1	1	17
	3	0	0	0	0	0	1	1	1	1	0	0	4
	Tier Totals	4	3	3	3	3	4	5	5	5	3	2	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).
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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.
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 SRO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1						Form ES-401-3 (R8, S1)		
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1						X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures 41.10, 43.2	4.0/4.3	1
000003 Dropped Control Rod / 1	X						AK1.16 MTC 41.8, 41.10	2.9/3.2	1
000005 Inoperable/Stuck Control Rod / 1				X			AA1.04 Reactor and turbine power 41.7	3.9/3.9	1
000011 Large Break LOCA / 3					✓		EA2.06 That fan is in slow speed and dampers are in accident mode during LOCA 43.5	3.7/4.0	1
W/E04 LOCA Outside Containment / 3				X			EA1.3 Desired operating results during abnormal and emergency situations 41.7	3.8/4.0	1
W/EO1 & E02 Rediagnosis & SI Termination / 3		✓					EK2.2 Facilitys 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. 41.7	3.5/3.8	1
000015/17 RCP Malfunctions / 4					X		AA2.10 When to secure RCPs on loss of cooling or seal injection 43.5	3.7/3.7	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4						X	2.4.7 Knowledge of event based EOP mitigation strategies 43.5	3.1/3.8	1
000024 Emergency Boration / 1	X						AK1.04 Low temperature limits for boron concentration 41.8 41.10	2.8/3.6	1
000026 Loss of Component Cooling Water / 8					X		AA2.02 The cause of possible CCW loss 43.5	2.9/3.6	1
000029 Anticipated Transient w/o Scram / 1			✓				EK3.12 Actions contained in EOP for ATWS	3.1/3.1	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4				X			EA1.3 Desired operating results during abnormal and emergency conditions 41.3	3.4/3.9	1
CE/A11; W/E08 RCS Overcooling - PTS / 4					X		EA2.1 Facility conditions and selection of appropriate procedures during abnormal and emergency operations 43.5	3.4/4.2	1
000051 Loss of Condenser Vacuum / 4						X	2.1.32 Ability to explain and apply all system limits and precautions	3.4/3.8	1
000055 Station Blackout / 6	X						EK1.02 Natural circulation cooling	4.1/4.4	1
000057 Loss of Vital AC Elec. Inst. Bus / 6			X				AK3.01 Actions contained in EOP for loss of vital ac electrical instrument bus	4.1/4.4	1
000059 Accidental Liquid RadWaste Rel. / 9		✓					AK2.02 Radioactive Gas Monitors	3.6/3.9	1
000062 Loss of Nuclear Service Water / 4			X		✓		AK3.02 The automatic actions (alignments) within the nuclear service water resulting from the actuation of the ESFAS	3.6/3.9	1
							AA2.04 The normal values an upper limits for the tempertures of the components cooled by SWS	2.5/2.9	1
000067 Plant Fire On-site / 9				X			AA1.07 Fire alarm reset panel	2.9/3.0	1
000068 (BW/A06) Control Room Evac. / 8			✓				AK3.08 Trip of the MFW and necessary Condensate pumps	2.4/2.7	1
000069 (W/E14) Loss of CTMT Integrity / 5					X		EA2.2 Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.3/3.8	1

000074 (W/E06&E07) Inad. Core Cooling / 4						X	2.4.6 Knowlege of symptom based EOP mitigation strategies	3.1/4.0	1
BW/E03 Inadequate Subcooling Margin / 4							N/A		
000076 High Reactor Coolant Activity / 9		X					AK2.01 Process radiation monitors	2.6/3.0	1
BW/A02&A03 Loss of NNI-X/Y / 7							N/A		
K/A Category Totals:	3	3	4	4	6	4	Group Point Total:		24

ES-401	PWR SRO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2							Form ES-401-3 (R8, S1)
E/APE # / Name / Safety Function	K1	K2	K3	A 1	A2	G	K/A Topic(s)	Imp.	Points
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1					✓		EA2.06 Occurrence of a reactor trip	4.3/4.5	1
BW/A01 Plant Runback / 1							N/A		
BW/A04 Turbine Trip / 4							N/A		
000008 Pressurizer Vapor Space Accident / 3		X					AK2.02 Sensors and detectors	2.7/2.7	1
000009 Small Break LOCA / 3			X				EK3.28 Manual ESFAS initiation requirements	4.5/4.5	1
BW/E08; W/E03 LOCA Cooldown - Depress. / 4					X		EA2.2 Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.5/4.1	1
W/E11 Loss of Emergency Coolant Recirc. / 4						X	2.1.2 Knowledge of operator responsibilities during all modes of plant operation	3.0/4.0	1
000022 Loss of Reactor Coolant Makeup / 2	X						AK1.01 Consequences of thermal shock to RCP seals	2.8/3.2	1
000025 Loss of RHR System / 4		X					AK2.01 RHR heat exchangers	2.9/2.9	1
000027 Pressurizer Pressure Control System Malfunction / 3							Randomly deleted to acquire the correct number of questions		
000032 Loss of Source Range NI / 7					✓		AA2.06 Confirmation of reactor trip	3.9/4.1	1
000033 Loss of Intermediate Range NI / 7			X				AK3.01 Termination of startup following loss of intermediate range instrumentation	3.2/3.6	1
000037 Steam Generator Tube Leak / 3				X			AA1.11 PZR level indicator	3.4/3.3	1
000038 Steam Generator Tube Rupture / 3					X		EA2.13 Magnitude of rupture	3.1/3.7	1
000054 (CE/E06) Loss of Main Feedwater / 4				✓			AA1.01 AFW Controls, including the use of alternate AFW sources	3.2/3.1	1
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4						X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	4.0/4.3	1
000058 Loss of DC Power / 6	✓						AK1.01 Battery charger equipment and instrumentation	2.8/3.1	1
000060 Accidental Gaseous Radwaste Rel. / 9		X					AK2.02 Auxiliary building ventilation system	2.7/3.1	1
000061 ARM System Alarms / 7							Randomly deleted to acquire the correct number of questions		
W/E16 High Containment Radiation / 9							Randomly deleted to acquire the correct number of questions		
000065 Loss of Instrument Air / 8						X	2.4.2 Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions	3.9/4.1	1
CE/E09 Functional Recovery							N/A		
K/A Category Point Totals:	2	3	2	2	4	3	Group Point Total:		16

ES-401	PWR SRO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 3						Form ES-401-3 (R8, S1)		
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / 2					✓		AA2.11 Leak in PZR	3.2/3.6	1
000036 (BW/A08) Fuel Handling Accident / 8				✓			AA1.02 ARM system	3.1/3.5	1
000056 Loss of Off-site Power / 6			✓				K3.02 actions contained in EOP for Loss of offsite power	4.4/4.7	1
BW/E13&E14 EOP Rules and Enclosures							N/A		
BW/A05 Emergency Diesel Actuation / 6							N/A		
BW/A07 Flooding / 8							N/A		
CE/A16 Excess RCS Leakage / 2							N/A		
W/E13 Steam Generator Over-pressure / 4							Randomly deleted to acquire the correct number of questions		
W/E15 Containment Flooding / 5							Randomly deleted to acquire the correct number of questions		
K/A Category Point Totals:			1	1	1		Group Point Total:		3

ES-401	PWR SRO Examination Outline Plant Systems - Tier 2/Group 1											Form ES-401-3 (R8, S1)		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A 2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive	X											K1.04 RCS	3.3/3.4	1
003 Reactor Coolant Pump		X										K2.02 CCW pumps	2.5/2.6	1
004 Chemical and Volume Control			X			X						K3.08 RCP seal injection	3.6/3.8	1
												K6.13 Purpose and function of the boration/dilution batch controller	3.1/3.3	1
013 Engineered Safety Features Actuation							X					A1.06 RWST level	3.6/3.9	1
014 Rod Position Indication				X								K4.06 Individual and group misalignment	3.4/3.7	1
015 Nuclear Instrumentation		X			X							K2.01 NIS channels, components, and interconnections	3.3/3.7	1
												K5.02 Discrimination/compensation operation	2.7/2.9	1
017 In-core Temperature Monitor						X						K6.01 Sensors and detectors	2.7/3.0	1
022 Containment Cooling							X					A1.01 Containment temperature	3.6/3.7	1
025 Ice Condenser												N/A		
026 Containment Spray								X				A2.05 Failure of chemical addition tanks to inject	3.7/4.1	1
056 Condensate								X				A2.04 Loss of condensate pumps	2.6/2.8	1
059 Main Feedwater									X			A3.06 Feedwater isolation	2.7/2.9	1
061 Auxiliary/Emergency Feedwater										X		A2.05 Automatic control malfunction	3.1/3.3	1
063 DC Electrical Distribution				X								K4.04 Trips	2.6/2.9	1

068 Liquid Radwaste	X								X			K1.02 Waste Gas Vent Header	2.5/2.6	1
												A3.02 Automatic isolation	3.6/3.6	1
071 Waste Gas Disposal										X		A4.30 Water drainage from the WGDS decay tanks	2.9/2.6	1
072 Area Radiation Monitoring											X	2.4.4 Ability To recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	3.1/3.5	1
K/A Category Point Totals:	2	2	1	2	1	2	2	2	2	2	1	Group Point Total:		19

ES-401	PWR SRO Examination Outline Plant Systems - Tier 2/Group 2											Form ES-401-3 (R8, S1)		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant	X											K1.07 Reactor vessel level indication system	3.5/3.7	1
006 Emergency Core Cooling		X										K2.01 ECCS pumps	3.6/3.9	1
010 Pressurizer Pressure Control			X									K3.01 RCS	3.8/3.9	1
011 Pressurizer Level Control				X								K4.02 PZR level controller	3.3/3.4	1
012 Reactor Protection					X							K5.01 DNB	3.3/3.8	1
016 Non-nuclear Instrumentation								X				A2.02 Loss of power supply	2.9/3.2	1
027 Containment Iodine Removal											X	2.1.32 Ability to explain and apply all system limits and precautions	3.4/3.8	1
028 Hydrogen Recombiner and Purge Control					X							K5.03 Sources of hydrogen within containment	2.9/3.6	1
029 Containment Purge									X			A3.01 CPS isolation	3.8/4.1	1
033 Spent Fuel Pool Cooling												Randomly deleted to acquire the correct number of questions		
034 Fuel Handling Equipment							X					A1.02 Water level in the refueling canal	2.9/3.7	1
035 Steam Generator										X		A4.05 Level control to enhance natural circulation	3.8/4.0	1
039 Main and Reheat Steam	X											K1.02 Atmospheric relief dump valves	3.3/3.3	1
055 Condenser Air Removal												Randomly deleted to acquire the correct number of questions		
062 AC Electrical Distribution			X									K3.03 DC system	3.7/3.9	1
064 Emergency Diesel Generator						X						K6.07 Air receivers	2.7/2.9	1
073 Process Radiation Monitoring							X					A1.01 Radiation levels	3.2/3.5	1
075 Circulating Water												Randomly deleted to acquire the correct number of questions		
079 Station Air								X				A2.01 Cross-connection with IAS	2.9/3.2	1
086 Fire Protection									X			A3.01 Starting mechanisms of fire water pumps	2.9/3.3	1
103 Containment												Randomly deleted to acquire the correct number of questions		
K/A Category Point Totals:	2	1	2	1	2	1	2	2	2	1	1	Group Point Total:		17

ES-401 | PWR SRO Examination Outline
Plant Systems - Tier 2/Group 3 | Form ES-401-3 (R8, S1)

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal												Randomly deleted to acquire the correct number of questions		
007 Pressurizer Relief/Quench Tank						✓						K5.02 Method of forming a steam bubble in the PZR	3.1/3.4	1
008 Component Cooling Water							✓					A1.02 CCW temperature	2.9/3.1	1
041 Steam Dump/Turbine Bypass Control												Randomly deleted to acquire the correct number of questions		
045 Main Turbine Generator								✓				A2.17 Malfunction of electrohydraulic control	2.7/ 2.9	1
076 Service Water												Randomly deleted to acquire the correct number of questions		
078 Instrument Air									X			A3.01 Air pressure	3.1/3.2	1
K/A Category Point Totals:						1	1	1	1			Group Point Total:		4

Plant-Specific Priorities

System / Topic	Recommended Replacement for...	Reason	Points

Plant-Specific Priority Total: (limit 10)

Facility: Prairie Island	Date of Exam: 08/12/02		Exam Level: RO	
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.6	Ability to supervise and assume a management role during plant transients and upset conditions	2.1/4.3	1
	2.1.10	Knowledge of conditions an limitations in the facility license	2.7/3.9	1
	2.1.22	Ability to determine Mode of Operations	2.8/3.3	1
	2.1.33	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications	3.4/4.0	1
	Total			4
Equipment Control	2.2.6	Knowledge of the process for making changes in procedures as described in the safety analysis report	2.3/3.3	1
	2.2.22	Knowledge of limiting conditions for operations and safety limit	3.4/4.1	1
	2.2.28	Knowledge of new and spent fuel movement procedures	3.5/3.3	1
	2.2.26	Knowledge of refueling administrative requirements	2.5/3.7	1
	Total			4
Radiation Control	2.3.1	Knowledge of 10CFR: 20 and related facility radiation control	2.6/3.0	1
	2.3.4	Knowledge radiation exposure limits and contamination control, ihcluding permissible levels in excess of those authorized	2.5/3.1	1
	2.3.11	Ability to control radiation releases	2.7/3.2	1
	2.3.6	Knowledge of the requirements for reviewing and approving release permits	2.1/3.1	1
	Total			4
Emergency Procedures/ Plan	2.4.1	Knowledge of EOP entry conditions and immediate action steps	4.3/4.6	1
	2.4.22	Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations	3.0/4.0	1
	2.4.41	Knowledge of emergency action level thresholds and classifications	2.3/4.1	1
	2.4.44	Knowledge of emergency plan protective action recommendations	2.1/4.0	1
	2.4.28	Knowledge of procedures relating to emergency response to sabotage	2.3/4.3	1
	Total			5
Tier 3 Point Total (RO/SRO)				17

Tier / Group	Randomly Selected K/A	Reason for Rejection
1 / 1	W/E08 EA2.1	K/A was at the SRO level instead of at the RO level. Randomly selected another K/A, which was K/A W/E08 EA1.3
2 / 3	034 A1.02	Reactor Operators do NOT have any involvement with refueling operations. Randomly selected another K/A, which was K/A 007 K1.03

Facility: Prairie Island Date of Examination: 8/12/02
Examination Level (circle one): RO / SRO Operating Test Number: _____

Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Conduct of Operations	Determine Maximum RCS vent time due to voids in RCS (JPM Admin 10) (K/A 2.1.23) **[DIRECT, SIMULATOR]**
	Conduct of Operations	Conduct Control Board Walkdown for Shift Turnover [Identify ~~5~~ 3 of ~~5~~ 3 errors on the Main Control Board] [K/A 2.1.3] [3.0/3.4] **[NEW, SIMULATOR]** reduced [illegible] constraints, adequate to meet walkdown performance HP
A.2	Equipment Control	Review an Isolation for 11 TDAFW Pump and determine what if any TS LCO's will result from isolation of the equipment [K/A 2.2.13, 2.1.24] [3.1/3.3, 2.8/3.1] **[NEW, CLASSROOM]** JPM changed due to licensee info that due to condition TDAFW would not have been tagged out. Focused on risk assmt. HP
A.3	Radiation Control	Give candidate initial conditions for an emergency containment entry and have candidate identify what actions are necessary. [K/A 2.3.10] [2.9/3.3] **[New, CLASSROOM]**
A.4	Emergency Action Levels and Classifications	Given specific initial conditions candidate must make emergency classifications, PARS recommendations, and Fill out forms PINGP 577 and PINGP 666 **[NEW, CLASSROOM]**

Facility: Prairie Island	Date of Examination: _____
Examination Level (circle one): RO / SRO	Operating Test Number: _____

Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Conduct of Operations	Conduct Control Board Walkdown for Shift Turnover [Identify ~~5~~ 3 of ~~5~~ 3 errors on the Main Control Board][K/A 2.1.3] [3.0/3.4] **[NEW, SIMULATOR]** Reduced [illegible] walkdown performance [illegible]
	Conduct of Operations	Perform alternate calorimetric (JPM RC-20, SP005B) [K/A 2.1.23] [3.9/4.0] **[DIRECT, SIMULATOR]**
A.2	Equipment Control	Prepare an Isolation for 11 TDAFW Pump [K/A 2.2.13, 2.1.24] [3.1/3.3, 2.8/3.1] **[NEW, CLASSROOM]**
A.3	Radiation Control	Determine preparation requirements for emergency containment entry [K/A 2.3.10] [2.9/3.3] **[NEW, CLASSROOM]**
A.4	Emergency Plan	Phone in an Emergency Call to The NRC. The Red Phone will not work, the operator must use another phone and call the NRC commercial number. [K/A 2.4.12] [3.4/3/9] **[NEW, SIMULATOR]**

Facility: Prairie Island Date of Examination: _____
Exam Level (circle one): RO / SRO(I) / SRO(U) Operating Test No.: _____

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a. Transfer SI to Recirculation with Failure of One Safeguard Train [JPM B.1.d] [K/A 006A4.02] [4.0/ 3.8]	D,A,L,S	2
b. Raise #12 Accumulator Level [JPM SI-2S, Rev 1] [K/A 006A1.13] [3.5/3.7]	D,S	3
c. Lineup RHR and Commence Phase II Cooldown using RHR Pump [JPM RH-5S] [K/A 005A4.01] [3.6/3.4]	D,L,S	4P
d. Perform "Quarterly Turbine Stop, Governor, and Intercept Valve Test" per SP 1054 [K/A 045A4.01, 045A4.06] [3.1/2.9, 2.8/2.7]	N,S	4S
e. Manually Start D1 from the Control Room and Load onto Bus 15 [JPM EG-4&5S [K/A 064A4.06] [3.9/ 3.9]	D,S	6
f. Perform NIS Power Range Daily Calibration with Thermal Power greater than Instrument Power per SP 1005 [K/A 015A1.01] [3.5, 3.8]	N,A,S	7
g. Respond to an Abnormal Radiation Level During Waste Gas Release [JPM WG-1SF] [K/A 071A2.02, 071A3.03] [3.3/3.6, 3.6/3.8]	D,A,S	9

B.2 Facility Walk-Through

a. Manually Borate the RCS from Outside the Control Room [JPM VC-19F-1] [K/A 004A2.14] [3.8/3.9]	D,A,R	1
b. Transfer Unit 1 Auxiliary Feedwater Pump Suction from the CST to Cooling Water per C28.1 AOP2 [K/A 061K4.01] [4.1/4.2]	N,L	4S
c. Cross-Connect U2 to U1 CC System per 1C14 AOP3 [K/A 008A2.01] [3.3, 3.6]	N,R	8

* 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: Prairie Island Date of Examination: _____
Exam Level (circle one): RO / SRO(I) / SRO(U) Operating Test No.: 2002301

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
b. Raise #12 Accumulator Level [JPM SI-2S, Rev 1] [K/A 006A1.13] [3.5/3.7]	D,S	3
f. Perform NIS Power Range Daily Calibration withThermal Power greater than Instrument Power per SP 1005 [K/A 015A1.01] [3.5, 3.8]	N,A,S	7
B.2 Facility Walk-Through		
a. Manually Borate the RCS from Outside the Control Room [JPM VC-19F-1] [K/A 004A2.14] [3.8/3.9]	D,A,R	1
b. Transfer Unit 1 Auxiliary Feedwater Pump Suction from the CST to Cooling Water per C28.1 AOP2 [K/A 061K4.01] [4.1/4.2]	N,L	4S
c. Cross-Connect U2 to U1 CC System per 1C14 AOP3 [K/A 008A2.01] [3.3, 3.6]	N,R	8

* 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: _Prairie Island___ Scenario No.: ____1___ Op-Test No.: 2001301

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: BOL, recovery from reactor scram 24 hours ago, currently 15% power, D2 OOS, 12 AFW OOS, Place Steam Dump in Stm. Pressure mode Instrument maintenance is peforming troubleshooting on the Steam Dump Tave control mode

Turnover: Recovery from Trip 24 hours ago. Raise power to 100% at maximum rate, MSRs are already in service.

Event No.	Malf. No.	Event Type*	Event Description
1		R (RO) N (BOP)	Raise reactor power 5-10%. RO will adjust reactivity by controlling boron concentration BOP will increase power by increasing turbine load, Lineup 13 Feedwater Heater drains for normal operation, Start one heater drain pump per 1C28.4, Heater Drains, and Shutdown the Condenser Spray System per 1C28.5.
2		I (RO) (BOP)	PT 431 (PZR press) fails high - take manual control of pressure and trip bistables (Simulator file number 97-03)
3		C (RO)	Charging pump trip-start another charging pump (Simulator file number 97-02)
4		I (BOP)	PT-484 failure high - Manual control to shut steam dumps (Simulator file 99-05)
5		C (BOP)	11 Condensate pump motor stator HI temp - start a different condensate pump
6		M (All)	Uncontrolled depressurization of both S/G's - steam leak on A steam header results in manual reactor trip (if not already tripped) and stuck open S/G PORV on B S/G - Gets to ECA-2.1 (Simulator file 97-03)
7		C (BOP)	SI pump fails to start on SI signal-manually start SI pump

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

Facility: _Prairie Island___ Scenario No.: __2_____ Op-Test No.: _____

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: ___Unit 1 is at 77% power. Load increase per C1.4 is in progress. Unit power was reduced to replace a bearing on 12 MFP. Equip OOS: 11TD AFW Pump, 12 EH oil pump, D5 Diesel Generator, 13 condensate pump to be used in an emergency only.

Turnover: __Commence load increase per C1.4 _____

Event No.	Malf. No.	Event Type*	Event Description
1		R (RO) N (BOP)	Load increase per C1.4 File 99-04 RO will adjust reactivity by controlling boron concentration BOP will increase power by increasing turbine load.
2		I (BOP)	Diagnose a hotwell level transmitter failure and perform actions IAW C47009-0601 level goes to -7" BOP must open MV-32041 ATT023
3		I (RO)	N42 Power range failure high. Crew will respond per 1C51.2 RO must put rods in manual File ATT023
4		C (RO)	Loss of Instrument Air to containment C34 AOP1 RO must control charging and letdown, and manually control pressure to prevent cycling of PORV's. File 99-04
5		C (BOP)	11 Component Cooling Water pump trip, 12 CCW pump fails to start automatically. BOP must recognize the failure of the standby pump to auto start and manually start it.
6		M (ALL)	Loss of MFW, 11 MFW is manually tripped on loss of lube oil File 12 MFW pump trips for unknown reason. File 99-04
7		C(RO) (BOP)	AFW starts and then trips - loss of heat sink - RO must stop RCPs and depressurize RCS - BOP must depressurize SG's and feed with condensate File 99-04

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

Facility: Prairie Island Scenario No.: 3 Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: **Unit 1:** 100% Power, End of Cycle, Equilibrium Xenon, Breaker 16-10 (Bus 16/Bus 26 Bustie) is OOS. Steam Generator tube leakage of 4 GPD in 11 SG. **Unit 2:** 100% power steady state operation

Turnover: The 11 and 12 Heater Drain (HD) Pumps are presently running. Want to start the 13 HD Pump and shutdown the 12 HD Pump so that preventive maintenance can be performed on the 12 HD Pump. Steps 5.3.1 and 5.3.2 have been completed in Section 5.3 of 1C28.4, "Unit 1 Heater Drains" for swapping HD Pumps. A local operator is available by the HD Pumps to perform any required actions during the pump swap.

Event No.	Malf. No.	Event Type*	Event Description
1		N(BOP)	Start the 13 HD Pump and shutdown the 12 HD Pump
2		I (RO)	Loop B Tcold transmitter failure high (Rods step in and Charging Pump in "AUTO" increases to maximum speed; must place rod control in "MANUAL")
3		C(RO)	Pressurizer PORV (CV-31232) leaking (requires isolation)
4		R (RO)	High stator temperature on 11 Main Feedwater Pump (requires turbine load decrease to 330 MWe, since will need to shutdown pump within 30 minutes)
5		C (BOP)	12 SG FW Reg Valve controller fails "as is" in AUTO (will need to control 12 SG level in "MANUAL")
6		C(BOP)	11 Main Feedwater Pump trip (will need to rapidly reduce turbine load)
7		M(ALL)	Feedwater line break on 11 SG inside containment. Requires entry into E-0 and then E-2.
8		C(BOP)	Failure of turbine to AUTO trip on Reactor Trip (will require MANUAL turbine trip)
9		C(BOP)	Failure of Phase A to AUTO actuate on SI (will require MANUAL actuation of Phase A)
10		M(ALL)	SGTR on 11 SG when SG is fully depressurized. Requires entry into E-3 and then ECA-3.1.

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

Facility: Prairie Island Scenario No.: 4 Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: **Unit 1:** 50% power, Middle of Cycle, Equilibrium Xenon, 11 SI Pump is OOS (on hour 16 of a 72 hour clock, expected back in 8 hours), 12 Charging Pump is OOS for overhaul. Breaker 16-10 (Bus 16/Bus 26 Bustie) is OOS. Steam Generator tube leakage of 4 GPD in 11 SG.
Unit 2: 100% power steady state operations

Turnover: Perform power increase on Unit 1 to 100%.
Are presently at Step 5.21.E of 1C1.4, "Unit 1 Power Operation" at the step to start the second feedwater pump per 1C28.2, "Unit 1 Feedwater System". Steps 5.5.1 through 5.5.8 of Section 5.5 of 1C28.2 have been completed.

Event No.	Malf. No.	Event Type*	Event Description
1		N(BOP)	Start 12 Main Feedwater Pump
2		R(RO)	Reactor power increase
3		I(RO)	Turbine 1st stage pressure channel 1PT-485 failure high (rods step out, must place rod control in "MANUAL")
4		I(BOP)	11 SG pressure channel 1PT-468 failure high (11 SG PORV opens, must manually close PORV)
5		I(RO)	Pressurizer level channel 1L-428 failure low (letdown isolates, PRZR heaters deenergize, and Charging Pump in "AUTO" increases to maximum speed)
6		C(RO)	RCS leak (30 gpm). Requires entry into 1C4 AOP1.
7		M(ALL)	Small break LOCA. Requires use of E-0, E-1, and ES-1.1.
8		C(BOP)	Bus 16 deenergizes due to breaker failure from CT-11 transformer, with a concurrent sequencer failure. Diesel Generator D2 trips during start. Will need to reenergize Bus 16 from 1RY transformer per 1C20.5 AOP2. (if do not reenergize Bus 16, will need to go to FR-C.2 for degraded core cooling due to no high head SI flow, since have no SI Pumps or PD Charging Pumps)
9		C(BOP)	12 RHR pump does not AUTO start on SI (will require manual start of pump)

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

Final - as administered
RO - written outline
SRO - written outline
(includes ES. 401-10 - rejected a changed K/As.)

Facility: Prairie Island Date of Exam: 08/12/02 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	2	1	3				4	3			3	16
	2	3	3	3				3	2			3	17
	3	1	1	0				0	0			1	3
	Tier Totals	6	5	6				7	5			7	36
2. Plant Systems	1	2	2	2	2	3	2	3	2	2	2	1	23
	2	3	1	2	3	1	1	1	3	2	1	2	20
	3	2	0	1	1	1	0	0	0	1	1	1	8
	Tier Totals	7	3	5	6	5	3	4	5	5	4	4	51

3. Generic Knowledge and Abilities	Cat 1	Cat 2	Cat 3	Cat 4	13
	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 ±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 Emergency and Abnormal Plant Evolutions - Tier 1/Group 1							Form ES-401-4 (R8, S1)
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000005 Inoperable/Stuck Control Rod / 1				X			AA1.04 Reactor and turbine power	3.9/3.9	1
000015/17 RCP Malfunctions / 4					X		AA2.10 When to secure RCPs on loss of cooling or seal injection	3.7/3.7	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4						X	2.4.7 Knowledge of event based EOP mitigation strategies	3.1/3.8	1
000024 Emergency Boration / 1	X						AK1.04 Low temperature limits for boron concentration	2.8/3.6	1
000026 Loss of Component Cooling Water / 8					X		AA2.02 The cause of possible CCW loss	2.9/3.6	1
000027 Pressurizer Pressure Control System Malfunction / 3			X				AK3.03 Actions contained in EOP for PZR PCS malfunction	3.7/4.1	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4				X			EA1.3 Desired operating results during abnormal and emergency situations	3.4/3.9	1
CE/A11; W/E08 RCS Overcooling - PTS / 4				X			EA1.3 Desired operating results during abnormal and emergency situations	3.6/4.0	1
000051 Loss of Condenser Vacuum / 4						X	2.1.32 Ability to explain and apply all system limits and precautions	3.4/3.8	1
000055 Station Blackout / 6	X						EK1.02 Natural circulation cooling	4.1/4.4	1
000057 Loss of Vital AC Elec. Inst. Bus / 6			X				AK3.01 Actions contained in EOP for loss of vital ac electrical instrument bus	4.1/4.4	1
000062 Loss of Nuclear Service Water / 4			X				AK3.02 The automatic actions (alignments) within the nuclear service water resulting from the actuation of the ESFAS	3.6/3.9	1
000067 Plant Fire On-site / 9				X			AA1.07 Fire alarm reset panel	2.9/3.0	1
000069 (W/E14) Loss of CTMT Integrity / 5					X		EA2.2 Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.3/3.8	1
000074 (W/E06&E07) Inad. Core Cooling / 4						X	2.4.6 Knowlege of symptom based EOP mitigation strategies	3.1/4.0	1
000076 High Reactor Coolant Activity / 9		X					AK2.01 Process radiation monitors	2.6/3.0	1
K/A Category Totals:	2	1	3	4	3	3	Group Point Total:		16

ES-401	PWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2							Form ES-401-4 (R8, S1)
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1						X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	4.0/4.3	1
000003 Dropped Control Rod / 1	X						AK1.16 MTC	2.9/3.2	1
000008 Pressurizer Vapor Space Accident / 3		X					AK2.02 Sensors and detectors	2.7/2.7	1
000009 Small Break LOCA / 3			X				EK3.28 Manual ESFAS initiation requirements	4.5/4.5	1
W/E04 LOCA Outside Containment / 3				X			EA1.3 Desired operating results during abnormal and emergency situations	3.8/4.0	1
BW/E08; W/E03 LOCA Cooldown/Depress. / 4					X		EA2.2 Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.5/4.1	1
W/E11 Loss of Emergency Coolant Recirc. / 4						X	2.1.2 Knowledge of operator responsibilities during all modes of plant operation	3.0/4.0	1
000022 Loss of Reactor Coolant Makeup / 2	X						AK1.01 Consequences of thermal shock to RCP seals	2.8/3.2	1
000025 Loss of RHR System / 4		X					AK2.01 RHR heat exchangers	2.9/2.9	1
000033 Loss of Intermediate Range NI / 7			X				AK3.01 Termination of startup following loss of intermediate rannge instrumentation	3.2/3.6	1
000037 Steam Generator Tube Leak / 3				X			AA1.11 PZR level indicator	3.4/3.3	1
000038 Steam Generator Tube Rupture / 3					X		EA2.13 Magnitude of rupture	3.1/3.7	1
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4						X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	4.0/4.3	1
000059 Accidental Liquid RadWaste Rel. / 9	X						AK1.01 Types of radiation, their units of intensity and the location of the sources of radiation in a nuclear power plant	2.7/3.1	1
000060 Accidental Gaseous Radwaste Rel. / 9		X					AK2.02 Auxiliary building ventilation system	2.7/3.1	1
000061 ARM System Alarms / 7			X				AK3.02 Guidance contained in alarm response for ARM system	3.4/3.6	1
W/E16 High Containment Radiation / 9				X			EA1.3 Desired operating results during abnormal and emergency situations	2.9/3.3	1
K/A Category Point Totals:	3	3	3	3	2	3	Group Point Total:		17

ES-401	PWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 3							Form ES-401-4 (R8, S1)	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000065 Loss of Instrument Air / 8						X	2.4.2 Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions	3.9/4.1	1
W/E13 Steam Generator Over-pressure / 4	X						EK1.2 Normal, abnormal and emergency operating procedures associated with (Steam Generator Overpressure)	3.0/3.3	1
W/E15 Containment Flooding / 5		X					EK2.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	2.8/2.9	1
K/A Category Point Totals:	1	1	0	0	0	1	Group Point Total:		3

ES-401	PWR RO Examination Outline Plant Systems - Tier 2/Group 1											Form ES-401-4 (R8, S1)		
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								K1.04 RCS	3.3/3.4	2
												K4.07 Rod stops	3.7/3.8	
003 Reactor Coolant Pump		X			X							K2.02 CCW pumps	2.5/2.6	2
												K5.04 Effects of RCP shutdown on secondary parameters, such as steam pressure, steam flow, and feed flow	3.2/3.5	
004 Chemical and Volume Control			X			X						K3.08 RCP seal injection	3.6/3.8	2
												K6.13 Purpose and function of the boration/dilution batch controller	3.1/3.3	
013 Engineered Safety Features Actuation				X			X					K4.13 MFW isolation/reset	3.7/3.9	2
												A1.06 RWST level	3.6/3.9	
015 Nuclear Instrumentation		X			X							K2.01 NIS channels, components, and interconnections	3.3/3.7	2
												K5.02 Discrimination/compensation operation	2.7/2.9	
017 In-core Temperature Monitor						X						K6.01 Sensors and detectors	2.7/3.0	1
022 Containment Cooling							X					A1.01 Containment temperature	3.6/3.7	1
056 Condensate								X				A2.04 Loss of condensate pumps	2.6/2.8	1
059 Main Feedwater							X		X			A1.03 Power level restrictions for operation of MFW pumps and valves	2.7/2.9	2
												A3.06 Feedwater isolation	3.2/3.3	
061 Auxiliary/Emergency Feedwater								X		X		K4.07 Turbine trip, including overspeed	3.1/3.3	2
												A2.05 Automatic control malfunction	3.1/3.4	
068 Liquid Radwaste	X								X			K1.02 Waste Gas Vent Header	2.5/2.6	2
												A3.02 Automatic isolation	3.6/3.6	

ES-401	PWR RO Examination Outline Plant Systems - Tier 2/Group 1											Form ES-401-4 (R8, S1)		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
071 Waste Gas Disposal					X					X		K5.04 Relationship of hydrogen/oxygen concentrations to flammability	2.5/3.1	2
												A4.30 Water drainage from the WGDS decay tanks	2.9/2.6	
072 Area Radiation Monitoring			X								X	K3.02 Fuel handling operations	3.1/3.5	2
												2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	4.0/4.3	
K/A Category Point Totals:	2	2	2	2	3	2	3	2	2	2	1	Group Point Total:		23

ES-401	PWR RO Examination Outline Plant Systems - Tier 2/Group 2											Form ES-401-4 (R8, S1)		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant	X											K1.07 Reactor vessel level indication system	3.5/3.7	1
006 Emergency Core Cooling		X										K2.01 ECCS pumps	3.6/3.9	1
010 Pressurizer Pressure Control			X									K3.01 RCS	3.9/3.9	1
011 Pressurizer Level Control				X								K4.02 PZR level controller	3.3/3.4	1
012 Reactor Protection					X							K5.01 DNB	3.3/3.8	1
014 Rod Position Indication				X								K4.06 Individual and group misalignment	3.4/3.7	1
016 Non-nuclear Instrumentation								X				A2.02 Loss of power supply	2.9/3.2	1
026 Containment Spray								X				A2.05 Failure of chemical addition tanks to inject	3.7/4.1	1
029 Containment Purge									X			A3.01 CPS isolation	3.8/4.1	1
033 Spent Fuel Pool Cooling											X	2.1.27 Knowledge of system purpose and or function	2.8/2.9	1
035 Steam Generator										X		A4.05 Level control to enhance natural circulation	3.8/4.0	1
039 Main and Reheat Steam	X											K1.02 Atmospheric relief dump valves	3.3/3.3	1
055 Condenser Air Removal	X											K1.06 PRM system	2.6/2.6	1
062 AC Electrical Distribution			X									K3.03 DC system	3.7/3.9	1
063 DC Electrical Distribution				X								K4.04 Trips	2.6/2.9	1
064 Emergency Diesel Generator						X						K6.07 Air receivers	2.7/2.9	1
073 Process Radiation Monitoring							X					A1.01 Radiation levels	3.2/3.5	1
075 Circulating Water											X	2.4.31 Knowledge of annunciator alarms and indications, and use of the response instructions	3.3/3.4	1
079 Station Air								X				A2.01 Cross-connection with IAS	2.9/3.2	1
086 Fire Protection									X			A3.01 Starting mechanisms of fire water pumps	2.9/3.3	1
K/A Category Point Totals:	3	1	2	3	1	1	1	3	2	1	2	Group Point Total:		20

ES-401	PWR RO Examination Outline Plant Systems - Tier 2/Group 3	Form ES-401-4 (R8, S1)

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	3.4/3.1	1
027 Containment Iodine Removal											X	2.1.32 Ability to explain and apply all system limits and precautions	3.4/3.8	1
028 Hydrogen Recombiner and Purge Control					X							K5.03 Sources of hydrogen within containment	2.9/3.6	1
007 Pressurizer Relief Tank / Quench Tank System	X											K1.03 RCS	3.0/3.2	1
041 Steam Dump/Turbine Bypass Control			X									K3.02 RCS	3.8/3.9	1
076 Service Water				X								K4.02 Automatic start features associated with SWS pump controls	2.9/3.2	1
078 Instrument Air									X			A3.01 Air pressure	3.1/3.2	1
103 Containment	X											K1.03 Shield building vent system	3.1/3.5	1
K/A Category Point Totals:	2	0	1	1	1	0	0	0	1	1	1	Group Point Total:		8

Plant-Specific Priorities

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

Facility: Prairie Island		Date of Exam: 08/12/02		Exam Level: RO
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.1	Knowledge of conduct of operations requirements	3.7/3.8	1
	2.1.3	Knowledge of shift turnover practices	3.0/3.4	1
	2.1.29	Knowledge of how to conduct and verify valve lineups	3.4/3.3	1
	Total			3
Equipment Control	2.2.12	Knowledge of surveillance procedures	3.0/3.4	1
	2.2.13	Knowledge of tagging and clearance procedures	3.6/3.8	1
	2.2.30	Knowledge of RO duties in the control room during fuel handling such as alarm from fuel handling area, communication with fuel storage facility, systems operated from the control board in support of fueling operations, and supporting instrumentation	3.5/3.3	1
	Total			3
Radiation Control	2.3.1	Knowledge of 10CFR: 20 and related facility radiation control	2.6/3.0	1
	2.3.2	Knowledge of facility ALARA program	2.5/2.9	1
	2.3.11	Ability to control radiation releases	2.7/3.2	1
	Total			3
Emergency Procedures/ Plan	2.4.2	Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions	4.3/4.6	1
	2.4.6	Knowledge of symptom based EOP mitigation strategies	3.1/4.0	1
	2.4.11	Knowledge of abnormal condition procedures	3.4/3.6	1
	2.4.20	Knowledge of operational implications of EOP warnings, cautions, and notes	3.3/4.0	1
	Total			4
Tier 3 Point Total (RO/SRO)				13

Tier / Group	Randomly Selected K/A	Reason for Rejection
1 / 1	W/E08 EA2.1	K/A was at the SRO level instead of at the RO level. Randomly selected another K/A, which was K/A W/E08 EA1.3
2 / 3	034 A1.02	Reactor Operators do NOT have any involvement with refueling operations. Randomly selected another K/A, which was K/A 007 K1.03

Facility: Prairie Island Date of Exam: 8/16/2002 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	A2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	3	3	4				4	6			4	24
	2	2	3	2				2	4			3	16
	3	0	0	1				1	1			0	3
	Tier Totals	5	6	7				7	11			7	43
2. Plant Systems	1	2	2	1	2	1	2	2	2	2	2	1	19
	2	2	1	2	1	2	1	2	2	2	1	1	17
	3	0	0	0	0	0	1	1	1	1	0	0	4
	Tier Totals	4	3	3	3	3	4	5	5	5	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).
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 SRO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1						Form ES-401-3 (R8, S1)		
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1						X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures 41.10, 43.2	4.0/4.3	1
000003 Dropped Control Rod / 1	X						AK1.16 MTC 41.8, 41.10	2.9/3.2	1
000005 Inoperable/Stuck Control Rod / 1				X			AA1.04 Reactor and turbine power 41.7	3.9/3.9	1
000011 Large Break LOCA / 3					✓		EA2.06 That fan is in slow speed and dampers are in accident mode during LOCA 43.5	3.7/4.0	1
W/E04 LOCA Outside Containment / 3				X			EA1.3 Desired operating results during abnormal and emergency situations 41.7	3.8/4.0	1
W/EO1 & E02 Rediagnosis & SI Termination / 3		✓					EK2.2 Facilitys 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. 41.7	3.5/3.8	1
000015/17 RCP Malfunctions / 4					X		AA2.10 When to secure RCPs on loss of cooling or seal injection 43.5	3.7/3.7	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4						X	2.4.7 Knowledge of event based EOP mitigation strategies 43.5	3.1/3.8	1
000024 Emergency Boration / 1	X						AK1.04 Low temperature limits for boron concentration 41.8 41.10	2.8/3.6	1
000026 Loss of Component Cooling Water / 8					X		AA2.02 The cause of possible CCW loss 43.5	2.9/3.6	1
000029 Anticipated Transient w/o Scram / 1			✓				EK3.12 Actions contained in EOP for ATWS	3.1/3.1	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4				X			EA1.3 Desired operating results during abnormal and emergency conditions 41.3	3.4/3.9	1
CE/A11; W/E08 RCS Overcooling - PTS / 4					X		EA2.1 Facility conditions and selection of appropriate procedures during abnormal and emergency operations 43.5	3.4/4.2	1
000051 Loss of Condenser Vacuum / 4						X	2.1.32 Ability to explain and apply all system limits and precautions	3.4/3.8	1
000055 Station Blackout / 6	X						EK1.02 Natural circulation cooling	4.1/4.4	1
000057 Loss of Vital AC Elec. Inst. Bus / 6			X				AK3.01 Actions contained in EOP for loss of vital ac electrical instrument bus	4.1/4.4	1
000059 Accidental Liquid RadWaste Rel. / 9		✓					AK2.02 Radioactive Gas Monitors	3.6/3.9	1
000062 Loss of Nuclear Service Water / 4			X		✓		AK3.02 The automatic actions (alignments) within the nuclear service water resulting from the actuation of the ESFAS	3.6/3.9	1
							AA2.04 The normal values an upper limits for the tempertures of the components cooled by SWS	2.5/2.9	1
000067 Plant Fire On-site / 9				X			AA1.07 Fire alarm reset panel	2.9/3.0	1
000068 (BW/A06) Control Room Evac. / 8			✓				AK3.08 Trip of the MFW and necessary Condensate pumps	2.4/2.7	1
000069 (W/E14) Loss of CTMT Integrity / 5					X		EA2.2 Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.3/3.8	1

000074 (W/E06&E07) Inad. Core Cooling / 4						X	2.4.6 Knowlege of symptom based EOP mitigation strategies	3.1/4.0	1
BW/E03 Inadequate Subcooling Margin / 4							N/A		
000076 High Reactor Coolant Activity / 9		X					AK2.01 Process radiation monitors	2.6/3.0	1
BW/A02&A03 Loss of NNI-X/Y / 7							N/A		
K/A Category Totals:	3	3	4	4	6	4	Group Point Total:		24

ES-401	PWR SRO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2						Form ES-401-3 (R8, S1)		
E/APE # / Name / Safety Function	K1	K2	K3	A 1	A2	G	K/A Topic(s)	Imp.	Points
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1					✓		EA2.06 Occurrence of a reactor trip	4.3/4.5	1
BW/A01 Plant Runback / 1							N/A		
BW/A04 Turbine Trip / 4							N/A		
000008 Pressurizer Vapor Space Accident / 3		X					AK2.02 Sensors and detectors	2.7/2.7	1
000009 Small Break LOCA / 3			X				EK3.28 Manual ESFAS initiation requirements	4.5/4.5	1
BW/E08; W/E03 LOCA Cooldown - Depress. / 4					X		EA2.2 Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.5/4.1	1
W/E11 Loss of Emergency Coolant Recirc. / 4						X	2.1.2 Knowledge of operator responsibilities during all modes of plant operation	3.0/4.0	1
000022 Loss of Reactor Coolant Makeup / 2	X						AK1.01 Consequences of thermal shock to RCP seals	2.8/3.2	1
000025 Loss of RHR System / 4		X					AK2.01 RHR heat exchangers	2.9/2.9	1
000027 Pressurizer Pressure Control System Malfunction / 3							Randomly deleted to acquire the correct number of questions		
000032 Loss of Source Range NI / 7					✓		AA2.06 Confirmation of reactor trip	3.9/4.1	1
000033 Loss of Intermediate Range NI / 7			X				AK3.01 Termination of startup following loss of intermediate range instrumentation	3.2/3.6	1
000037 Steam Generator Tube Leak / 3				X			AA1.11 PZR level indicator	3.4/3.3	1
000038 Steam Generator Tube Rupture / 3					X		EA2.13 Magnitude of rupture	3.1/3.7	1
000054 (CE/E06) Loss of Main Feedwater / 4				✓			AA1.01 AFW Controls, including the use of alternate AFW sources	3.2/3.1	1
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4						X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	4.0/4.3	1
000058 Loss of DC Power / 6	✓						AK1.01 Battery charger equipment and instrumentation	2.8/3.1	1
000060 Accidental Gaseous Radwaste Rel. / 9		X					AK2.02 Auxiliary building ventilation system	2.7/3.1	1
000061 ARM System Alarms / 7							Randomly deleted to acquire the correct number of questions		
W/E16 High Containment Radiation / 9							Randomly deleted to acquire the correct number of questions		
000065 Loss of Instrument Air / 8						X	2.4.2 Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions	3.9/4.1	1
CE/E09 Functional Recovery							N/A		
K/A Category Point Totals:	2	3	2	2	4	3	Group Point Total:		16

ES-401	PWR SRO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 3						Form ES-401-3 (R8, S1)		
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / 2					✓		AA2.11 Leak in PZR	3.2/3.6	1
000036 (BW/A08) Fuel Handling Accident / 8				✓			AA1.02 ARM system	3.1/3.5	1
000056 Loss of Off-site Power / 6			✓				K3.02 actions contained in EOP for Loss of offsite power	4.4/4.7	1
BW/E13&E14 EOP Rules and Enclosures							N/A		
BW/A05 Emergency Diesel Actuation / 6							N/A		
BW/A07 Flooding / 8							N/A		
CE/A16 Excess RCS Leakage / 2							N/A		
W/E13 Steam Generator Over-pressure / 4							Randomly deleted to acquire the correct number of questions		
W/E15 Containment Flooding / 5							Randomly deleted to acquire the correct number of questions		
K/A Category Point Totals:			1	1	1		Group Point Total:		3

ES-401	PWR SRO Examination Outline Plant Systems - Tier 2/Group 1											Form ES-401-3 (R8, S1)		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive	X											K1.04 RCS	3.3/3.4	1
003 Reactor Coolant Pump		X										K2.02 CCW pumps	2.5/2.6	1
004 Chemical and Volume Control			X			X						K3.08 RCP seal injection	3.6/3.8	1
												K6.13 Purpose and function of the boration/dilution batch controller	3.1/3.3	1
013 Engineered Safety Features Actuation							X					A1.06 RWST level	3.6/3.9	1
014 Rod Position Indication				X								K4.06 Individual and group misalignment	3.4/3.7	1
015 Nuclear Instrumentation		X			X							K2.01 NIS channels, components, and interconnections	3.3/3.7	1
												K5.02 Discrimination/compensation operation	2.7/2.9	1
017 In-core Temperature Monitor						X						K6.01 Sensors and detectors	2.7/3.0	1
022 Containment Cooling							X					A1.01 Containment temperature	3.6/3.7	1
025 Ice Condenser												N/A		
026 Containment Spray								X				A2.05 Failure of chemical addition tanks to inject	3.7/4.1	1
056 Condensate								X				A2.04 Loss of condensate pumps	2.6/2.8	1
059 Main Feedwater									X			A3.06 Feedwater isolation	2.7/2.9	1
061 Auxiliary/Emergency Feedwater										X		A2.05 Automatic control malfunction	3.1/3.3	1
063 DC Electrical Distribution				X								K4.04 Trips	2.6/2.9	1

068 Liquid Radwaste	X								X			K1.02 Waste Gas Vent Header	2.5/2.6	1
												A3.02 Automatic isolation	3.6/3.6	1
071 Waste Gas Disposal										X		A4.30 Water drainage from the WGDS decay tanks	2.9/2.6	1
072 Area Radiation Monitoring											X	2.4.4 Ability To recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	3.1/3.5	1
K/A Category Point Totals:	2	2	1	2	1	2	2	2	2	2	1	Group Point Total:		19

ES-401	PWR SRO Examination Outline Plant Systems - Tier 2/Group 2											Form ES-401-3 (R8, S1)		
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant	X											K1.07 Reactor vessel level indication system	3.5/3.7	1
006 Emergency Core Cooling		X										K2.01 ECCS pumps	3.6/3.9	1
010 Pressurizer Pressure Control			X									K3.01 RCS	3.8/3.9	1
011 Pressurizer Level Control				X								K4.02 PZR level controller	3.3/3.4	1
012 Reactor Protection					X							K5.01 DNB	3.3/3.8	1
016 Non-nuclear Instrumentation								X				A2.02 Loss of power supply	2.9/3.2	1
027 Containment Iodine Removal											X	2.1.32 Ability to explain and apply all system limits and precautions	3.4/3.8	1
028 Hydrogen Recombiner and Purge Control					X							K5.03 Sources of hydrogen within containment	2.9/3.6	1
029 Containment Purge									X			A3.01 CPS isolation	3.8/4.1	1
033 Spent Fuel Pool Cooling												Randomly deleted to acquire the correct number of questions		
034 Fuel Handling Equipment							X					A1.02 Water level in the refueling canal	2.9/3.7	1
035 Steam Generator										X		A4.05 Level control to enhance natural circulation	3.8/4.0	1
039 Main and Reheat Steam	X											K1.02 Atmospheric relief dump valves	3.3/3.3	1
055 Condenser Air Removal												Randomly deleted to acquire the correct number of questions		
062 AC Electrical Distribution			X									K3.03 DC system	3.7/3.9	1
064 Emergency Diesel Generator						X						K6.07 Air receivers	2.7/2.9	1
073 Process Radiation Monitoring							X					A1.01 Radiation levels	3.2/3.5	1
075 Circulating Water												Randomly deleted to acquire the correct number of questions		
079 Station Air								X				A2.01 Cross-connection with IAS	2.9/3.2	1
086 Fire Protection									X			A3.01 Starting mechanisms of fire water pumps	2.9/3.3	1
103 Containment												Randomly deleted to acquire the correct number of questions		
K/A Category Point Totals:	2	1	2	1	2	1	2	2	2	1	1	Group Point Total:		17

ES-401	PWR SRO Examination Outline Plant Systems - Tier 2/Group 3	Form ES-401-3 (R8, S1)

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal												Randomly deleted to acquire the correct number of questions		
007 Pressurizer Relief/Quench Tank						✓						K5.02 Method of forming a steam bubble in the PZR	3.1/3.4	1
008 Component Cooling Water							✓					A1.02 CCW temperature	2.9/3.1	1
041 Steam Dump/Turbine Bypass Control												Randomly deleted to acquire the correct number of questions		
045 Main Turbine Generator								✓				A2.17 Malfunction of electrohydraulic control	2.7/ 2.9	1
076 Service Water												Randomly deleted to acquire the correct number of questions		
078 Instrument Air									X			A3.01 Air pressure	3.1/3.2	1
K/A Category Point Totals:						1	1	1	1			Group Point Total:		4

Plant-Specific Priorities

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

Facility: Prairie Island	Date of Exam: 08/1602		Exam Level: SRO	
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.6	Ability to supervise and assume a management role during plant transients and upset conditions	2.1/4.3	1
	2.1.10	Knowledge of conditions an limitations in the facility license	2.7/3.9	1
	2.1.22	Ability to determine Mode of Operations	2.8/3.3	1
	2.1.33	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications	3.4/4.0	1
	Total			4
Equipment Control	2.2.6	Knowledge of the process for making changes in procedures as described in the safety analysis report	2.3/3.3	1
	2.2.22	Knowledge of limiting conditions for operations and safety limit	3.4/4.1	1
	2.2.28	Knowledge of new and spent fuel movement procedures	3.5/3.3	1
	2.2.26	Knowledge of refueling administrative requirements	2.5/3.7	1
	Total			4
Radiation Control	2.3.1	Knowledge of 10CFR: 20 and related facility radiation control	2.6/3.0	1
	2.3.4	Knowledge radiation exposure limits and contamination control, ihcluding permissible levels in excess of those authorized	2.5/3.1	1
	2.3.11	Ability to control radiation releases	2.7/3.2	1
	2.3.6	Knowledge of the requirements for reviewing and approving release permits	2.1/3.1	1
	Total			4
Emergency Procedures/ Plan	2.4.1	Knowledge of EOP entry conditions and immediate action steps	4.3/4.6	1
	2.4.22	Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations	3.0/4.0	1
	2.4.41	Knowledge of emergency action level thresholds and classifications	2.3/4.1	1
	2.4.44	Knowledge of emergency plan protective action recommendations	2.1/4.0	1
	2.4.28	Knowledge of procedures relating to emergency response to sabotage	2.3/4.3	1
	Total			5
Tier 3 Point Total (RO/SRO)				17