

2010 PRAIRIE ISLAND NUCLEAR GENERATING PLANT

INITIAL EXAMINATION

OUTLINE SUBMITTAL

REVISION 1

Facility: Prairie Island

Printed:

Date Of Exam: March 2010

REVISION 1 (R.D)

Tier	Group	RO K/A Category Points												SRO-Only Points				
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	A2	G*	Total		
1. Emergency & Abnormal Plant Evolutions	1	3	3	3	N/A			3	3	N/A			3	18	0	0	0	
	2	1	2	2				1	2				1	9	0	0	0	
	Tier Totals	4	5	5				4	5				4	27	0	0	0	
2. Plant Systems	1	3	2	3	3	2	2	3	3	2	2	3	28	0	0	0		
	2	1	1	1	1	1	1	1	0	1	1	1	10	0	0	0		
	Tier Totals	4	3	4	4	3	3	4	3	3	3	4	38	0	0	0		
3. Generic Knowledge And Abilities Categories					1		2		3		4		10	1	2	3	4	0
					2		3		2		3			0	0	0	0	

Note:

1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).
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 RO exam must total 75 points and the SRO-only exam must total 25 points.
3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.
4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.
5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
- 7.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.
8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.
9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

PWR RO Examination Outline

R1

Printed

Facility: Prairie Island

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Point
000007 Reactor Trip - Stabilization - Recovery / 1		X					EK2.02 - Breakers, relays and disconnects	2.6	1
000008 Pressurizer Vapor Space Accident / 3				X			AA1.01 - PZR spray block valve and PORV block valve	4.2	1
000011 Large Break LOCA / 3					X		EA2.11 - Conditions for throttling or stopping HPI	3.9	1
000022 Loss of Rx Coolant Makeup / 2						X	2.4.46 – Ability to verify that the alarms are consistent with the plant conditions.	4.2	1
000025 Loss of RHR System / 4	X						AK1.01 - Loss of RHRS during all modes of operation	3.9	1
000026 Loss of Component Cooling Water / 8				X			AA1.07 - Flow rates to the components and systems that are serviced by the CCWS; interactions among the components	2.9	1
000027 Pressurizer Pressure Control System Malfunction / 3		X					AK2.03 - Controllers and positioners	2.6	1
000029 ATWS / 1					X		EA2.02 – Reactor Trip Alarm	4.2	1
000038 Steam Gen. Tube Rupture / 3				X			EA1.44 – Level operating limits for S/Gs	3.4*	1
000054 Loss of Main Feedwater / 4	X						AK1.01 - MFW line break depressurizes the S/G (similar to a steam line break)	4.1	1
000055 Station Blackout / 6	X						EK1.02 - Natural circulation cooling	4.1	1
000058 Loss of DC Power / 6					X		AA2.01 - That a loss of dc power has occurred; verification that substitute power sources have come on line	3.7	1
00062 Loss of Nuclear Svc Water / 4						X	2.4.8 - Knowledge of how abnormal operating procedures are used in conjunction with EOP's.	3.8	1
000065 Loss of Instrument Air / 8			X				AK3.08 - Actions contained in EOP for loss of instrument air	3.7	1
W/E04 LOCA Outside Containment / 3		X					EK2.2 - Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility	3.8	1
W/E05 Inadequate Heat Transfer - Loss of secondary Heat Sink / 4						X	2.1.7 – Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.4	1

PWR RO Examination Outline

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Facility: Prairie Island

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Point
W/E11 Loss of Emergency Coolant Recirc. / 4			X				EK3.3 - Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations	3.8	1
W/E12 - Steam Line Rupture - Excessive Heat Transfer / 4			X				EK3.1 - Facility oper. characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics	3.5	1
K/A Category Totals:	3	3	3	3	3	3	Group Point Total:	18	

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Facility: Prairie Island

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Point
000001 Continuous Rod Withdrawal / 1			X				AK3.01 - Manually driving rods into position that existed before start of casualty	3.2	1
000005 Inoperable/Stuck Control Rod / 1				X			AA1.01 - CRDS	3.6	1
000028 Pressurizer Level Malfunction / 2						X	2.4.31 - Knowledge of annunciator alarms, indications, or response procedures).	4.2	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	1
000076 High Reactor Coolant Activity / 9			X				AK3.05 - Corrective actions as a result of high fission-product radioactivity level in the RCS	2.9	1
W/E06 Inad. Core Cooling / 4					X		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.5	1
W/E10 Natural Circ. With steam void in vessel with/without RVLIS / 4		X					EK2.2 - Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility	3.6	1
W/E13 Steam Generator Over-pressure / 4		X					EK2.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.0	1
W/E16 High Containment Radiation / 9					X		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.0	1
K/A Category Totals:	1	2	2	1	2	1		Group Point Total:	9

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Facility: Prairie Island

Plant Systems - Tier 2 / Group 1

Form ES-401-2

ES - 401

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Point
003 Reactor Coolant Pump	X											K1.04 - CVCS	2.6*	1
004 Chemical and Volume					X							K5.07 - Relationship between SUR and reactivity	2.8	1
005 Residual Heat Removal			X									K3.01 - RCS	3.9	1
006 Emergency Core Cooling						X						K6.02 - Core flood tanks (accumulators)	3.4	1
007 Pressurizer Relief/Quench Tank			X									K3.01 - Containment	3.3	1
008 Component Cooling Water								X				A2.08 - Effects of shutting (auto or otherwise) the isolation valves of the letdown cooler	2.5	1
010 Pressurizer Pressure Control											X	2.4.11 - Knowledge of abnormal condition procedures.	4.0	1
010 Pressurizer Pressure Control				X								K4.03 - Over pressure control	3.8	1
012 Reactor Protection	X											K1.05 - ESFAS	3.8*	1
013 Engineered Safety Features Actuation		X										K2.01 - ESFAS/safeguards equipment control	3.6*	1
022 Containment Cooling	X											K1.04 - Chilled Water	2.9*	1
026 Containment Spray										X		A4.05 - Containment spray reset switches	3.5	1
026 Containment Spray							X					A1.05 - Chemical additive tank level and concentration	3.1	1
039 Main and Reheat Steam				X								K4.07 - Reactor building isolation	3.4	1
059 Main Feedwater									X			A3.06 - Feedwater Isolation	3.2*	1
059 Main Feedwater				X								K4.16 - Automatic Trips for MFW pumps	3.1*	1
061 Auxiliary/Emergency Feedwater					X							K5.05 - Feed line voiding and water hammer	2.7	1
061 Auxiliary/Emergency Feedwater											X	2.4.18 - Knowledge of the specific bases for EOPs.	3.3	1
062 AC Electrical Distribution		X										K2.01 - Major system loads	3.3	1
063 DC Electrical Distribution								X				A2.01 - Grounds	2.5	1
063 DC Electrical Distribution										X		A4.03 - Battery discharge rate	3.0*	1
064 Emergency Diesel Generator											X	2.1.23 - Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.3	1
064 Emergency Diesel Generator						X						K6.07 - Air receivers	2.7	1
073 Process Radiation Monitoring							X					A1.01 - Radiation levels	3.2	1
076 Service Water								X				A2.01 - Loss of SWS	3.5*	1
078 Instrument Air			X									K3.02 - Systems having pneumatic valves and controls	3.4	1

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Facility: Prairie Island

Plant Systems - Tier 2 / Group 1

ES - 401

Form ES-401-2

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Point
078 Instrument Air									X			A3.01 - Air pressure	3.1	1
103 Containment							X					A1.01 - Containment pressure, temperature, and humidity	3.7	1
K/A Category Totals:	3	2	3	3	2	2	3	3	2	2	3	Group Point		28

PWR RO Examination Outline

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Facility: Prairie Island

Plant Systems - Tier 2 / Group 2

Form ES-401-2

ES - 401

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Point
001 Control Rod Drive				X								K4.15 - Operation of latching controls for groups and individual rods	2.7	1
002 Reactor Coolant					X							K5.19 - Neutron embrittlement	2.6	1
015 Nuclear Instrumentation	X											K1.03 - CRDS	3.1*	1
027 Containment Iodine Removal		X										K2.01 - Fans	3.1*	1
029 Containment Purge			X									K3.01 - Containment parameters	2.9	1
035 Steam Generator						X						K6.02 - Secondary PORV	3.1	1
045 Main Turbine Generator									X			A3.11 - Generator trip	2.6*	1
055 Condenser Air Removal											X	2.2.44 – Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.	4.6	1
068 Liquid Radwaste										X		A4.02 - Remote radwaste release	3.2*	1
086 Fire Protection							X					A1.01 - Fire header pressure	2.9	1
K/A Category Totals:	1	1	1	1	1	1	1	0	1	1	1	Group Point Total:	10	

Generic Knowledge and Abilities Outline (Tier 3)

PWR RO Examination Outline

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Facility: Prairie Island

Form ES-401-3

<u>Generic Category</u>	<u>KA</u>	<u>KA Topic</u>	<u>Imp.</u>	<u>Points</u>
Conduct of Operations	2.1.29	Knowledge of how to conduct system lineups, such as valves, breakers, switches, etc.	4.1	1
	2.1.41	Knowledge of the refueling process.	2.8	1
	Category Total:			2
Equipment Control	2.2.6	Knowledge of the process for making changes to procedures.	3.0	1
	2.2.14	Knowledge of the process for controlling equipment configuration or status.	3.9	1
	2.2.36	Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.	3.1	1
	Category Total:			3
Radiation Control	2.3.11	Ability to control radiation releases.	3.8	1
	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.	3.4	1
	Category Total:			2
Emergency Procedures/Plan	2.4.2	Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.	4.5	1
	2.4.6	Knowledge of EOP mitigation strategies.	3.7	1
	2.4.42	Knowledge of emergency response facilities.	2.6	1
	Category Total:			3

Generic Total: 10

Facility: Prairie Island

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Date Of Exam: March 2010

Tier	Group	RO K/A Category Points												SRO-Only Points				
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	A2	G*	Total		
1. Emergency & Abnormal Plant Evolutions	1	0	0	0	N/A			0	0	N/A			0	0	3	3	6	
	2	0	0	0				0	0				0	0	0	2	2	4
	Tier Totals	0	0	0				0	0				0	0	0	0	5	5
2. Plant Systems	1	0	0	0	0	0	0	0	0	0	0	0	0	3	2	5		
	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	
	Tier Totals	0	0	0	0	0	0	0	0	0	0	0	0	5	3	8		
3. Generic Knowledge And Abilities Categories				1		2		3		4		0		1	2	3	4	7
				0		0		0		0				2	2	1	2	

Note:

1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).
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 RO exam must total 75 points and the SRO-only exam must total 25 points.
3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.
4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.
5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
- 7.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.
8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.
9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

PWR SRO Examination Outline

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Facility: Prairie Island

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Point
000009 Small Break LOCA / 3					X		EA2.01 - Actions to be taken, based on RCS temperature and pressure, saturated and superheated	4.8	1
000015/000017 RCP Malfunctions / 4					X		AA2.02 - Abnormalities in RCP air vent flow paths and/or oil cooling	3.0	1
000040 Steam Line Rupture - Excessive Heat Transfer / 4						X	2.4.41 - Knowledge of the emergency action level thresholds and classifications.	4.6	1
000056 Loss of Off-site Power / 6						X	2.1.8 - Ability to coordinate personnel activities outside the control room	4.1	1
000057 Loss of Vital AC Inst. Bus / 6						X	2.2.25 - Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.	4.2	1
000077 Generator Voltage and Electric Grid Disturbances / 6					X		AA2.09 - Operational status of emergency diesel generators	4.3	1
K/A Category Totals:	0	0	0	0	3	3	Group Point Total:	6	

PWR SRO Examination Outline

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R.1

Facility: Prairie Island

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Point
000024 Emergency Boration / 1						X	2.4.4 - Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.	4.7	1
000051 Loss of Condenser Vacuum / 4					X		AA2.02 - Conditions requiring reactor and/or turbine trip	4.1	1
000067 Plant Fire On-site / 8						X	2.2.40 - Ability to apply Technical Specifications for a system.	4.7	1
000069 Loss of CTMT Integrity / 5					X		AA2.02 - Verification of automatic and manual means of restoring integrity	4.4	1
K/A Category Totals:	0	0	0	0	2	2		Group Point Total:	4

PWR SRO Examination Outline

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Facility: Prairie Island

ES - 401

Plant Systems - Tier 2 / Group 1

Form ES-401-2

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Point
003 Reactor Coolant Pump											X	2.4.45 – Ability to prioritize and interpret the significance of each annunciator or alarm	4.3	1
012 Reactor Protection System								X				A2.06 – Failure of RPS signal to trip the reactor	4.7	1
008 Component Cooling Water											X	2.1.20 - Ability to interpret and execute procedure steps.	4.6	1
062 AC Electrical Distribution								X				A2.16 - Degraded system voltages	2.9	1
103 Containment								X				A2.01 - Integrated leak rate test	2.6*	1
K/A Category Totals:	0	0	0	0	0	0	0	3	0	0	2	Group Point	5	

PWR SRO Examination Outline

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2.1

Facility: Prairie Island

Plant Systems - Tier 2 / Group 2

ES - 401

Form ES-401-2

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Point
011 Pressurizer Level Control								X				A2.10 – Failure of PZR level instrument - high	3.6	1
034 Fuel Handling Equipment								X				A2.01 – Dropped Fuel Element	4.4	1
041 Steam Dump System											X	2.4.18 – Knowledge of the specific bases for EOPs.	4.0	1
K/A Category Totals:	0	0	0	0	0	0	0	2	0	0	1	Group Point	3	

Generic Knowledge and Abilities Outline (Tier 3)

PWR SRO Examination Outline

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Facility: Prairie Island

Form ES-401-3

<u>Generic Category</u>	<u>KA</u>	<u>KA Topic</u>	<u>Imp.</u>	<u>Points</u>
Conduct of Operations	2.1.5	Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.	3.9	1
	2.1.14	Knowledge of criteria or conditions that require plant-wide announcements, such as pump starts, reactor trips, mode changes, etc.	3.1	1
	Category Total:			2
Equipment Control	2.2.17	Knowledge of the process for managing maintenance activities during power operations, such as risk assessments, work prioritization, and coordination with the transmission system operator.	3.8	1
	2.2.35	Ability to determine Technical Specification Mode of Operation.	4.5	1
	Category Total:			2
Radiation Control	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.	3.7	1
	Category Total:			1
Emergency Procedures/Plan	2.4.11	Knowledge of abnormal condition procedures.	4.2	1
	2.4.30	Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.	4.1	1
	Category Total:			2
Generic Total:				7

Facility: Prairie Island

Printed:

(2.1)

Date Of Exam: March 2010

Tier	Group	RO K/A Category Points												SRO-Only Points						
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	A2	G*	Total				
1. Emergency & Abnormal Plant Evolutions	1	0	0	0	N/A			0	0	N/A			0	0	3	3	6			
	2	0	0	0				0	0				0	0	0	0	0	2	2	4
	Tier Totals	0	0	0				0	0				0	0	0	0	0	0	5	5
2. Plant Systems	1	0	0	0	0	0	0	0	0	0	0	0	0	3	2	5				
	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3			
	Tier Totals	0	0	0	0	0	0	0	0	0	0	0	0	5	3	8				
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				0		0		0		0				2	2	1	2			

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PWR SRO Examination Outline

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R. 1

Facility: Prairie Island

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Point
000009 Small Break LOCA / 3					X		EA2.01 - Actions to be taken, based on RCS temperature and pressure, saturated and superheated	4.8	1
000015/000017 RCP Malfunctions / 4					X		AA2.02 - Abnormalities in RCP air vent flow paths and/or oil cooling	3.0	1
000040 Steam Line Rupture - Excessive Heat Transfer / 4						X	2.4.41 - Knowledge of the emergency action level thresholds and classifications.	4.6	1
000056 Loss of Off-site Power / 6						X	2.1.8 - Ability to coordinate personnel activities outside the control room	4.1	1
000057 Loss of Vital AC Inst. Bus / 6						X	2.2.25 - Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.	4.2	1
000077 Generator Voltage and Electric Grid Disturbances / 6					X		AA2.09 - Operational status of emergency diesel generators	4.3	1
K/A Category Totals:	0	0	0	0	3	3		Group Point Total:	6

PWR SRO Examination Outline

Printed

R. 1

Facility: Prairie Island

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Point
000024 Emergency Boration / 1						X	2.4.4 - Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.	4.7	1
000051 Loss of Condenser Vacuum / 4					X		AA2.02 - Conditions requiring reactor and/or turbine trip	4.1	1
000067 Plant Fire On-site / 8						X	2.2.40 - Ability to apply Technical Specifications for a system.	4.7	1
000069 Loss of CTMT Integrity / 5					X		AA2.02 - Verification of automatic and manual means of restoring integrity	4.4	1
K/A Category Totals:	0	0	0	0	2	2		Group Point Total:	4

PWR SRO Examination Outline

Printed

R.1

Facility: Prairie Island

Plant Systems - Tier 2 / Group 1

Form ES-401-2

ES - 401

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Point
003 Reactor Coolant Pump											X	2.4.1 - Knowledge of EOP entry conditions/Im. actions.	4.8	1
012 Reactor Protection System								X				A2.06 - Failure of RPS signal to trip the reactor	4.7	1
008 Component Cooling Water											X	2.1.20 - Ability to interpret and execute procedure steps.	4.6	1
062 AC Electrical Distribution								X				A2.16 - Degraded system voltages	2.9	1
103 Containment								X				A2.01 - Integrated leak rate test	2.6*	1
K/A Category Totals:	0	0	0	0	0	0	0	3	0	0	2		Group Point	5

PWR SRO Examination Outline

Printed

R.1

Facility: Prairie Island

ES - 401

Plant Systems - Tier 2 / Group 2

Form ES-401-2

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Point
011 Pressurizer Level Control								X				A2.10 – Failure of PZR level instrument - high	3.6	1
034 Fuel Handling Equipment								X				A2.01 – Dropped Fuel Element	4.4	1
041 Steam Dump System											X	2.4.18 – Knowledge of the specific bases for EOPs.	4.0	1
K/A Category Totals:	0	0	0	0	0	0	0	2	0	0	1	Group Point	3	

Generic Knowledge and Abilities Outline (Tier 3)

PWR SRO Examination Outline

Printed: R.1

Facility: Prairie Island

Form ES-401-3

<u>Generic Category</u>	<u>KA</u>	<u>KA Topic</u>	<u>Imp.</u>	<u>Points</u>
Conduct of Operations	2.1.5	Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.	3.9	1
	2.1.14	Knowledge of criteria or conditions that require plant-wide announcements, such as pump starts, reactor trips, mode changes, etc.	3.1	1
	Category Total:			2
Equipment Control	2.2.17	Knowledge of the process for managing maintenance activities during power operations, such as risk assessments, work prioritization, and coordination with the transmission system operator.	3.8	1
	2.2.35	Ability to determine Technical Specification Mode of Operation.	4.5	1
	Category Total:			2
Radiation Control	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.	3.7	1
	Category Total:			1
Emergency Procedures/Plan	2.4.11	Knowledge of abnormal condition procedures.	4.2	1
	2.4.30	Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.	4.1	1
	Category Total:			2
Generic Total:				7

Facility: Prairie Island		Date of Exam: March 2010		Operating Test No.: 1													
A P P L I C A N T	E V E N T T Y P E	Scenarios												T O T A L	M I N I M U M (*)		
		1			2			3			4						
		C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P				
													R	I	U		
R1	RX		1												1	1	
	NOR									1				1	1		
	I/C		2, 3				1, 3, 5			2, 6				7	4		
	MAJ		5				4			5				3	2		
	TS													0	0		
R2	RX					1								1	1		
	NOR			1										1	1		
	I/C			6, 7		2, 3								4	4		
	MAJ			5		4								2	2		
	TS													0	0		
R3	RX		1											1	1		
	NOR									1				1	1		
	I/C		2, 3				1, 3, 5			2, 6				7	4		
	MAJ		5				4			5				3	2		
	TS													0	0		
R4	RX					1								1	1		
	NOR			1										1	1		
	I/C			6, 7		2, 3								4	4		
	MAJ			5		4								2	2		
	TS													0	0		

Instructions:

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

Facility: Prairie Island		Date of Exam: March 2010		Operating Test No.: 1													
A P P L I C A N T	E V E N T T Y P E	Scenarios												T O T A L	M I N I M U M (*)		
		1			2			3			4						
		C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P				
													R	I	U		
R5	RX				1									1	1		
	NOR			1								1	2	1			
	I/C			6, 7	2, 3							3, 6	6	4			
	MAJ			5	4							5	3	2			
	TS												0	0			
R6	RX							1					1	1			
	NOR											1	1	1			
	I/C							3, 4				3, 6	4	4			
	MAJ							5				5	2	2			
	TS												0	0			
R7	RX											1	1	1			
	NOR								1				1	1			
	I/C								2, 6			2, 4	4	4			
	MAJ								5			5	2	2			
	TS												0	0			
U1	RX												0			0	
	NOR							1				1	2			1	
	I/C											2, 4	2			2	
	MAJ								5			5	2			1	
	TS								3, 4			2, 3, 4	5			2	

Instructions:

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

Facility: Prairie Island Date of Exam: March 2010 Operating Test No.: 1

A P P L I C A N T	E V E N T T Y P E	Scenarios												T O T A L	M I N I M U M(*)		
		1			2			3			4						
		C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P				
													R	I	U		
I1	RX							1					1		1		
	NOR	1											1		1		
	I/C	3			1, 3			3, 4					5		4		
	MAJ	5			4			5					3		2		
	TS	3, 4			2								3		2		
I2	RX							1					1		1		
	NOR	1											1		1		
	I/C	3			1, 3			3, 4					5		4		
	MAJ	5			4			5					3		2		
	TS	3, 4			2								3		2		
I3	RX										1		1		1		
	NOR	1											1		1		
	I/C	3					1, 3, 5				2, 4		6		4		
	MAJ	5					4				5		3		2		
	TS	3, 4											2		2		
I4	RX		1										1		1		
	NOR										1		1		1		
	I/C		2, 3		1, 3						2, 4		6		4		
	MAJ		5		4						5		3		2		
	TS				2						2, 3, 4		4		2		

Instructions:

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

Facility: <u> Prairie Island </u>		Date of Examination: <u> March 2010 </u>
Examination Level: RO <input checked="" type="checkbox"/> SRO <input type="checkbox"/>		Operating Test Number: <u> 1 </u>
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	P, D, R	Admin 43, Determine the Time to Boil During Reduced Inventory (2.1.25 3.9/4.2)
Conduct of Operations	D, R	Admin 48, RCS / Steam Generator Temperature Verification. (2.1.20 4.6/4.6)
Equipment Control	N, R	Admin 61, Approve An Equipment Isolation (2.2.13 4.1/4.3)
Radiation Control	N, R	Admin 62, Verification of Radiation Work Permit Limits (2.3.7 3.5/3.6)
Emergency Procedures/Plan	N/A	N/A
<p>NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.</p>		
<p>*Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1; randomly selected)</p>		

Facility: Prairie Island Date of Examination: March 2010
 Examination Level: RO SRO X Operating Test Number: 1

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N, R	Admin 63, Verify Time to Boiling Determination During Reduced Inventory Operations (2.1.25 3.9/4.2)
Conduct of Operations	N, R	Admin 64, Verify RCS / Steam Generator Temperature Determination (2.1.20 4.6/4.6)
Equipment Control	N, R	Admin 61, Approve An Equipment Isolation (2.2.13 4.1/4.3)
Radiation Control	N, R	Admin 62, Verification of Radiation Work Permit Limits (2.3.7 3.5/3.6)
Emergency Procedures/Plan	N, R	Admin 47, Emergency Classification of a Plant Event (2.4.41 4.6)

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

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

Facility: <u> Prairie Island </u>	Date of Examination: <u> March 2010 </u>	
Exam Level: RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	Operating Test No.: <u> 1 </u>	
Control Room Systems [@] (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a. FL-10SF-3, Lineup RWST to Charging During ATWS	A, P, D, S	1
b. EO-31SF-1, Perform Attachment L: Containment Isolation Actuation Failure	A, D, S	2
c. PS-3, Respond to a Pressurizer Level Channel Failing Low	D, S	3
d. AF-8S, Restore AFW Flow After AFW Pump Trip on Low Pressure	D, S	4S
e. RC-22SF-1, Lower PRT Level	A, P, D, S	5
f. EA-19SF, Restore Power to Bus 15 from Unit 2	A, N, EN, S	6
g. NI-4SF-1, N35 Failure High With Failure of Reactor to Trip	A, D, S	7
h. CC-6S, Loss of Component Cooling	N, S	8
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. VC-16, Borate Unit 1 RCS from Outside the Control Room	D, E, R	1
j. IP-3, Respond to Bypassed Instrument Inverter	D, E, P	6
k. AF-18, Control S/G Water Levels	N, E, L	4S
<p>[@] All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.</p>		
* Type Codes	Criteria for RO / SRO-I / SRO-U	
(A)lternate path	4-6 / 4-6 / 2-3	
(C)ontrol room		
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4	
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1	
(EN)gineered safety feature	- / - / ≥ 1 (control room system)	
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1	
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1	
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)	
(R)CA		
(S)imulator	≥ 1 / ≥ 1 / ≥ 1	

Facility: <u>Prairie Island</u>		Date of Examination: <u>March 2010</u>
Exam Level: RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>		Operating Test No.: <u>1</u>
Control Room Systems [@] (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a. FL-10SF-3, Lineup RWST to Charging During ATWS	A, P, D, S	1
b. N/A		
c. PS-3, Respond to a Pressurizer Level Channel Failing Low	D, S	3
d. AF-8S, Restore AFW Flow After AFW Pump Trip on Low Pressure	D, S	4S
e. RC-22SF-1, Lower PRT Level	A, P, D, S	5
f. EA-19SF, Restore Power to Bus 15 from Unit 2	A, N, EN, S	6
g. NI-4SF-1, N35 Failure High With Failure of Reactor to Trip	A, D, S	7
h. CC-6S, Loss of Component Cooling	N, S	8
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. VC-16, Borate Unit 1 RCS from Outside the Control Room	D, E, R	1
j. IP-3, Respond to Bypassed Instrument Inverter	D, E, P	6
k. AF-18, Control S/G Water Levels	N, E, L	4S
<p>@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.</p>		
* Type Codes	Criteria for RO / SRO-I / SRO-U	
(A)lternate path	4-6 / 4-6 / 2-3	
(C)ontrol room		
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4	
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1	
(EN)gineered safety feature	- / - / ≥ 1 (control room system)	
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1	
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1	
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)	
(R)CA	≥ 1 / ≥ 1 / ≥ 1	
(S)imulator		

Facility: <u> Prairie Island </u>		Date of Examination: <u> March 2010 </u>
Exam Level: RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/>		Operating Test No.: <u> 1 </u>
Control Room Systems [@] (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a. N/A		
b. EO-31SF-1, Perform Attachment L: Containment Isolation Actuation Failure	A, D, S	2
c. N/A		
d. N/A		
e. N/A		
f. EA-19SF, Restore Power to Bus 15 from Unit 2	A, N, EN, S	6
g. NI-4SF-1, N35 Failure High With Failure of Reactor to Trip	A, D, S	7
h. N/A		
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. VC-16, Borate Unit 1 RCS from Outside the Control Room	D, E, R	1
j. N/A		
k. AF-18, Control S/G Water Levels	N, E, L	4S
<p>[@] All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.</p>		
*Type Codes	Criteria for RO / SRO-I / SRO-U	
(A)lternate path	4-6 / 4-6 / 2-3	
(C)ontrol room		
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4	
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1	
(EN)gineered safety feature	- / - / ≥ 1 (control room system)	
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1	
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1	
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)	
(R)CA	≥ 1 / ≥ 1 / ≥ 1	
(S)imulator		

Appendix D

Scenario Outline

Form ES-D-1

Facility: __Prairie Island__ Scenario No.: __1__ Op-Test No.: __1__

Examiners: _____ Operators: _____

Initial Conditions: __50% Power with xenon increasing__

Turnover: __No Equipment OOS__

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	RX (RO) N (SRO,BOP)	Increase Power to 60%. Place Second Main Feed pump in service.
2	VC04A	C (RO)	11 Charging Pump Trips.
3	RX226	I (SRO, RO) TS (SRO)	Turbine 1 st Stage Pressure (PT-485) Fails High. T.S. LOC 3.3.1 Condition A and Table 3.3.1-1 Function 16.b.2.
4	RC14	TS(SRO)	RCS Leak. T.S. LCO 3.4.14 Condition A.
5	RC07A	M (All)	Small Break LOCA.
6	TC11A	C (BOP)	Failure of Turbine to Auto Trip.
7	SI05A, SI05B	C (BOP)	SI Pumps fail to auto start.

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

Scenario 1 Summary

The crew assumes the duty at 50% power with xenon increasing, No equipment OOS. The crew is directed to increase power to 60%. During the power rise a second main feedwater pump will be started.

After the crew has completed the power increase, 11 Charging Pump Trips. The RO will stabilize seal injection flows and/or start 13 charging pump. The crew responds IAW C47 and 1C12.1.

After the plant is stabilized, Turbine First Stage Pressure channel (PT-485) fails high. The RO will take rod control to manual and stabilize charging. The BOP will address the instrument failure and swap steam dumps to Pressure Mode. The SRO will determine T.S. requirements.

After the plant is stabilized, a 20 gpm RCS leak develops. The SRO will determine T.S. requirements. The crew responds IAW 1C4 AOP1.

After the crew identifies the T.S requirements for the RCS leak, a Small Break LOCA occurs. The crew will trip the reactor and enter 1E-0. Upon the trip, BOP will recognize the turbine fails to auto trip and both SI pumps fail to auto start and perform manual actions to remedy these failures. The crew will transition to 1E-1 and the scenario will continue until safeguards pumps are stopped in 1FR-P.1 or the first SI pump is stopped in 1ES-1.1.

Termination Criteria:

Safeguards pumps are stopped in 1FR-P.1 or the first SI pump is stopped in 1ES-1.1.

Critical Tasks:

E-0 -- H: Manually start at least one safety Injection pump before transition out of E-0.

E-0 – TCOA4: Control AFW flow within 38 minutes following a Reactor Trip.
(SWI O-35 identified Time Critical Operator Action).

E-0 -- Q: Trip turbine before leaving E-0.

E-1-- C: Trip all Reactor Coolant Pumps so that a severe challenge to Core Cooling does not occur when forced circulation in the RCS stops (Small Break LOCA).

Appendix D

Scenario Outline

Form ES-D-1

Facility: __ Prairie Island Scenario No.: __ 2 Op-Test No.: __ 1

Examiners: _____ Operators: _____

Initial Conditions: __ 71% Power and stable

Turnover: __ 11 CC Pump OOS

Event No.	Malf. No.	Event Type*	Event Description
1	FW13A	R (RO) C (SRO, BOP)	11 Main Feedwater Pump Trip.
2	NI05D	I (SRO, RO) TS (SRO)	N44 Power Range NI Fails High. T.S. LCO 3.3.1 Condition A and Table 3.3.1-1 Functions 2a, 2b, 3a, 3b, 6, 16b.1, 16c, 16d, 16e.
3	ED08C	C (All)	Loss of Power to Instrument Bus 113.
4	MS01A	M (All)	Steam Break I/S Containment on Trip.
5	RP06	C (BOP)	11/12 MSIVs fail to automatically close.

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

Scenario 2 Summary

The crew assumes the duty at 71% power and stable. 11 CC pump is OOS.

After the crew takes the duty, 11 MFW pump will trip. The RO will reduce power to ~50% using IAW 1C1.4 AOP1. BOP will address the ARP for the failure and manipulate control room switches as necessary to facilitate trouble shooting and ensure proper system response.

After the crew has completed the power reduction, N44 Power Range NI Fails High. The BOP will address the failure and remove the affected channel from service IAW C47 and 1C51. The RO will place rod control to manual and restore Tave to Tref. The SRO will determine T.S. requirements.

After the NI failure is addressed, Instrument Bus 113 loses power. The loss of Bus 113 compounded with N44 being OOS causes an automatic reactor trip. The crew will respond IAW 1E-0 and transition to 1ES-0.1. The SS will direct performance of 1C20.8 AOP1 to restore power to Instrument Bus 113 in conjunction with 1ES-0.1.

After power is restored to Instrument Bus 113, 11 S/G Main Steam line break in containment. The crew will transition back to 1E-0. The BOP will recognize the failure of 11/12 MSIV's to auto close and manually perform the action using 1E-0 Att. L. The crew will then transition to 1E-2 to isolate the faulted SG and transition to 1E-1. The scenario will be terminated when the crew transitions to 1FR-P.1 or upon termination of SI pumps in 1ES-0.2.

Termination Criteria:

When the crew transitions to 1FR-P.1 or upon termination of SI pumps in 1ES-0.2.

Critical Tasks:

E-0 -- P: Manually close MSIVs before transition out of E-0.

E-0 – TCOA4: Control AFW flow within 38 minutes following a Reactor Trip.
(SWI O-35 identified Time Critical Operator Action).

E-2 -- A: Isolate the faulted STEAM GENERATOR before transition out of E-2.

Appendix D Scenario Outline Form ES-D-1

Facility: Prarie Island Scenario No.: 3 Op-Test No.: 1

Examiners: _____ Operators: _____

Initial Conditions: Power is 1x10⁻⁸ amps and stable

Turnover: 13 Charging Pump is OOS

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R (RO) N (SRO, BOP)	Increase Power to Point of Adding Heat. 12 Condensate pump will be started to replace 11 for Filter Demin Support.
2	IA03B	C (BOP)	122 Instrument Air Compressor trips, 123 Instrument Air Compressor fails to auto start.
3	DI-46242OFF	C (RO) TS (SRO)	PZR Heater B/U Group 1B Breaker Trip. T.S. LCO 3.4.9 Condition B.
4	RX202	I (RO) TS (SRO)	PZR pressure channel (PT-431) fails High. T.S. LCO 3.3.1 Condition A and Table 3.3.1-1 Functions 6, 8a, 8b. T.S. LCO 3.3.2 Condition A and Table 3.3.2-1 Function 1d. T.S. LCO 3.4.1.a Condition A.
5	SG02B	M (All)	12 S/G Tube Rupture (on trip).
6	RP12	C (BOP)	SI signal CL System Fails.

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

Scenario 3 Summary

The crew assumes the duty with power at 1×10^{-8} amps and stable. 13 Charging Pump is OOS. The crew is directed to increase power to the POAH. During the power rise the BOP will start 12 Condensate pump and stop 11 Condensate pump.

After the crew has completed the power increase, 122 Air Compressor trips with the 123 A/C failed to auto start. The BOP will recognize that 123 Air Compressor does not automatically start and will manually start 123 Air Compressor. The crew responds IAW C47 and C34 AOP1.

After the plant is stabilized, PZR Heater B/U Group 1B Breaker will trip. The RO will co-ordinate with the BOP to align the heater group to the alternate power supply and restore the heaters to operation IAW 1C20.6. The SRO will determine T.S. requirements.

After the plant is stabilized, the controlling pressurizer pressure channel 1P-431 fails High. The RO will respond to stabilize RCS pressure. The RO and BOP will coordinate to swap the controlling pressurizer channel to another channel IAW C47 and 1C51.3. The SRO will determine T.S. requirements.

After the plant is stabilized, 12 S/G will suffer a Tube Rupture. The crew will trip the reactor and enter 1E-0. The BOP will recognize the CL systems fails to respond to the SI signal and will manually align the system IAW 1E-0 Att L. The crew will transition to 1E-3. The scenario will be terminated upon securing SI pumps in 1E-3.

Termination Criteria:

Upon securing SI pumps in 1E-3.

Critical Tasks:

E-0 – TCOA4: Control AFW flow within 38 minutes following a Reactor Trip. (SWI O-35 identified Time Critical Operator Action).

E-3 -- A: Isolate feedwater flow into and steam flow from the ruptured Steam Generator before a transition to ECA-3.1 occurs.

E-3 – B: Establish/maintain an RCS temperature so that transition from E-3 does not occur because of the inability to maintain required subcooling or such that an extreme or severe challenge to the Subcriticality and/or the Integrity CSF occurs.

E-3 -- C: Depressurize RCS to meet SI termination criteria prior to overfilling the ruptured Steam Generator.

E-3 -- D: Terminate SI prior to overfilling the ruptured Steam Generator.

Appendix D

Scenario Outline

Form ES-D-1

Facility: Prarie Island Scenario No.: 4 Op-Test No.: 1

Examiners: _____ Operators: _____

Initial Conditions: 100% Power and stable

Turnover: 12 MDAFW pump OOS, 13 Heater Drain Pump OOS

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R (RO) N (SRO, BOP)	Reduce Power to 90% for 12 Heater Drain Pump brush checks. At 95% the BOP remove 12 Heater Drain Pump from service.
2	ED17B, DI-46924T	C (SRO, RO) TS (SRO)	Loss of Safeguards Bus 16. T.S. LCO 3.8.9 Condition A and T.S. 3.8.4 Condition A.
3	RX216	C (BOP) TS (SRO)	12 S/G Pressure Instrument PT-478 Fails High, causing 12 S/G PORV to open. T.S. LCO 3.3.2 Condition A and Table 3.3.2-1 Function 1e.
4	RX05C	I (SRO, RO) TS (SRO)	Tavg Instrument Fails High. T.S. LCO 3.3.1 Condition A and Table 3.3.1-1 Functions 6, 7. T.S. LCO 3.3.2 Condition A and Table 3.3.2-1 Function 4d.
5	TC12, RP07A, RP07B, DI-46447B, DI-46447I	M (All)	Turbine Trip with ATWS.
6	FW34A	C (BOP)	11 TDAFW Fails to Auto start.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Scenario 4 Summary

The crew assumes the duty at 100% power and stable. 11 MDAFW pump and 13 Heater Drain pump are OOS. The crew will Reduce Power to 90% to remove 12 Heater Drain pump from service for brush inspections.

After the power reduction, Loss of Safeguards Bus 16 occurs. D2 D/G starts and does not auto load. The RO will stabilize RCP seal injection flows. The BOP will restore power to Bus 16 by restoring power from CT-11 IAW 1C20.5 AOP2. The SRO will determine T.S. requirements.

After Bus 16 is restored, 12 S/G Pressure instrument PT-478 Fails high causing 12 S/G PORV to open. The BOP will recognize the failure and manually close 12 S/G PORV. The SRO will determine T.S. requirements.

After the plant is stabilized, RCS Loop Thot RTD fails high causing Tavg and Delta T channels to indicate high. The RO will take manual control of charging and rod control. The BOP will coordinate with the RO to take the appropriate channel to 'defeat'. The SRO will determine T.S. requirements.

After the plant is stabilized, a spurious turbine trip signal occurs. The turbine will trip but the reactor does not. The Crew will enter 1E-0 and transition immediately to 1FR-S.1. The RO will recognize the ATWS and attempt to manually trip the Reactor, but will be unsuccessful. Rods will be inserted and a boration commenced IAW 1FR-S.1. The BOP will recognize the 11 TDAFW pump failed to automatically start and will manually start the pump. The scenario will be terminated upon successful tripping of the Reactor per 1FR-S.1 and transitioning back to 1E-0.

Termination Criteria:

Upon completion of 1FR-S.1 and transition back to 1E-0.

Critical Tasks:

E-0 – F: Establish and maintain 200 gpm AFW flow to the Steam Generator(s) before transition out of E-0, unless the transition is to FR-H.1, in which case the task must be initiated before RCPs are manually tripped in accordance with step 2 of FR-H.1.

FR-S.1 – C: Insert negative reactivity into the core by inserting rods or establishing emergency boration flow to the RCS during the performance of FR-S.1.

