

**Facility:** South Texas Project

Printed: 03/16/2011

Date Of Exam: 09/22/2011

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	2	2	1				2	2				0	9	0	0	0	
	Tier Totals	5	5	4				5	5				3	27	0	0	0	
2. Plant Systems	1	3	2	3	3	3	2	3	3	2	3	1	28	0	0	0		
	2	1	1	0	1	1	1	1	1	1	1	1	10	0	0	0		
	Tier Totals	4	3	3	4	4	3	4	4	3	4	2	38	0	0	0		
3. Generic Knowledge And Abilities Categories				1		2		3		4		10		1	2	3	4	0
				3		2		3		2				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**

Printed: 03/16/2011

Facility: South Texas Project

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.	Points
000007 Reactor Trip - Stabilization - Recovery / 1						X	2.1.30 - Ability to locate and operate components, including local controls.	4.4	1
000008 Pressurizer Vapor Space Accident / 3		X					AK2.01 - Valves	2.7*	1
000009 Small Break LOCA / 3					X		EA2.08 - Letdown isolation valve position indication	2.9*	1
000011 Large Break LOCA / 3						X	2.1.19 - Ability to use plant computers to evaluate system or component status.	3.9	1
000015/000017 RCP Malfunctions / 4			X				AK3.01 - Potential damage from high winding and/or bearing temperatures	2.5	1
000025 Loss of RHR System / 4		X					AK2.01 - RHR heat exchangers	2.9	1
000027 Pressurizer Pressure Control System Malfunction / 3	X						AK1.01 - Definition of saturation temperature	3.1	1
000029 ATWS / 1						X	2.4.47 - Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	4.2	1
000038 Steam Gen. Tube Rupture / 3			X				EK3.09 - Criteria for securing/throttling ECCS	4.1	1
000040 Steam Line Rupture - Excessive Heat Transfer / 4	X						AK1.07 - Effects of feedwater introduction on dry S/G	3.4	1
000054 Loss of Main Feedwater / 4			X				AK3.03 - Manual control of AFW flow control valves	3.8	1
000055 Station Blackout / 6	X						EK1.02 - Natural circulation cooling	4.1	1
000057 Loss of Vital AC Inst. Bus / 6				X			AA1.02 - Manual control of PZR level	3.8	1
000058 Loss of DC Power / 6				X			AA1.03 - Vital and battery bus components	3.1	1
000062 Loss of Nuclear Svc Water / 4				X			AA1.02 - Loads on the SWS in the control room	3.2	1
000065 Loss of Instrument Air / 8					X		AA2.06 - When to trip reactor if instrument air pressure is decreasing	3.6*	1
000077 Generator Voltage and Electric Grid Disturbances / 6					X		AA2.09 - Operational status of emergency diesel generators	3.9	1
W/E04 LOCA Outside Containment / 3		X					EK2.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.5	1
<b>K/A Category Totals:</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>		<b>Group Point Total: 18</b>	

**PWR RO Examination Outline**

Printed: 03/16/2011

**Facility:** South Texas Project

**ES - 401**

**Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2**

**Form ES-401-2**

<b>E/APE # / Name / Safety Function</b>	<b>K1</b>	<b>K2</b>	<b>K3</b>	<b>A1</b>	<b>A2</b>	<b>G</b>	<b>KA Topic</b>	<b>Imp.</b>	<b>Points</b>
000037 Steam Generator Tube Leak / 3	X						AK1.01 - Use of steam tables	2.9*	1
000059 Accidental Liquid RadWaste Rel. / 9		X					AK2.01 - Radioactive-liquid monitors	2.7	1
000067 Plant Fire On-site / 9				X			AA1.08 - Fire fighting equipment used on each class of fire	3.4	1
000068 Control Room Evac. / 8					X		AA2.05 - Availability of heat sink	4.2	1
000069 Loss of CTMT Integrity / 5			X				AK3.01 - Guidance contained in EOP for loss of containment integrity	3.8*	1
W/E02 SI Termination / 3					X		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.5	1
W/E03 LOCA Cooldown - Depress. / 4	X						EK1.2 - Normal, abnormal and emergency operating procedures associated with LOCA Cooldown and Depressurization	3.6	1
W/E08 RCS Overcooling - PTS / 4				X			EA1.2 - Operating behavior characteristics of the facility	3.6	1
W/E10 Natural Circ. / 4		X					EK2.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.3	1
<b>K/A Category Totals:</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>Group Point Total:</b>	<b>9</b>	

PWR RO Examination Outline

Printed: 03/16/2011

Facility: South Texas Project

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.	Points
003 Reactor Coolant Pump								X				A2.05 - Effects of VCT pressure on RCP seal leakoff flows	2.5	1
004 Chemical and Volume Control	X											K1.15 - ECCS	3.8	1
004 Chemical and Volume Control										X		A4.11 - RCP seal injection	3.4	1
005 Residual Heat Removal						X						K6.03 - RHR heat exchanger	2.5	1
005 Residual Heat Removal		X										K2.01 - RHR pumps	3.0	1
006 Emergency Core Cooling								X				A2.06 - Water hammer	3.3	1
006 Emergency Core Cooling											X	2.1.45 - Ability to identify and interpret diverse indications to validate the response of another indication.	4.3	1
007 Pressurizer Relief/Quench Tank				X								K4.01 - Quench tank cooling	2.6	1
008 Component Cooling Water		X										K2.02 - CCW pump, including emergency backup	3.0*	1
010 Pressurizer Pressure Control			X									K3.01 - RCS	3.8	1
012 Reactor Protection	X											K1.05 - ESFAS	3.8*	1
013 Engineered Safety Features Actuation										X		A4.01 - ESFAS-initiated equipment which fails to actuate	4.5	1
013 Engineered Safety Features Actuation					X							K5.02 - Safety system logic and reliability	2.9	1
022 Containment Cooling				X								K4.04 - Cooling of control rod drive motors	2.8	1
026 Containment Spray			X									K3.01 - CCS	3.9	1
039 Main and Reheat Steam									X			A3.02 - Isolation of the MRSS	3.1	1
039 Main and Reheat Steam					X							K5.08 - Effect of steam removal on reactivity	3.6	1
059 Main Feedwater			X									K3.04 - RCS	3.6	1
061 Auxiliary/Emergency Feedwater					X							K5.03 - Pump head effects when control valve is shut	2.6	1
061 Auxiliary/Emergency Feedwater								X				A2.05 - Automatic control malfunction	3.1*	1
062 AC Electrical Distribution							X					A1.03 - Effect on instrumentation and controls of switching power supplies	2.5	1
063 DC Electrical Distribution							X					A1.01 - Battery capacity as it is affected by discharge rate	2.5	1
064 Emergency Diesel Generator						X						K6.07 - Air receivers	2.7	1
073 Process Radiation Monitoring				X								K4.01 - Release termination	4.0	1

**PWR RO Examination Outline**

Printed: 03/16/2011

**Facility:** South Texas Project

**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 when radiation exceeds setpoint	Imp.	Points
076 Service Water							X					A1.02 - Reactor and turbine building closed cooling water temperatures	2.6*	1
078 Instrument Air	X											K1.05 - MSIV air	3.4*	1
078 Instrument Air									X			A3.01 - Air pressure	3.1	1
103 Containment										X		A4.04 - Phase A and phase B resets	3.5*	1
<b>K/A Category Totals:</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>Group Point Total:</b>		<b>28</b>

**PWR RO Examination Outline**

Printed: 03/16/2011

**Facility:** South Texas Project

**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.	Points
001 Control Rod Drive				X								K4.17 - Override (bypass) for rod bank motion when one rod is bottomed	2.9*	1
011 Pressurizer Level Control	X											K1.01 - CVCS	3.6	1
015 Nuclear Instrumentation							X					A1.03 - NIS power indication	3.7	1
017 In-core Temperature Monitor						X						K6.01 - Sensors and detectors	2.7	1
027 Containment Iodine Removal		X										K2.01 - Fans	3.1*	1
028 Hydrogen Recombiner and Purge Control										X		A4.03 - Location and operation of hydrogen sampling and analysis of containment atmosphere, including alarms and indications	3.1	1
035 Steam Generator									X			A3.01 - S/G water level control	4.0	1
056 Condensate								X				A2.04 - Loss of condensate pumps	2.6	1
068 Liquid Radwaste					X							K5.04 - Biological hazards of radiation and the resulting goal of ALARA	3.2	1
072 Area Radiation Monitoring											X	2.4.46 - Ability to verify that the alarms are consistent with the plant conditions.	4.2	1
<b>K/A Category Totals:</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>Group Point Total: 10</b>		

## Generic Knowledge and Abilities Outline (Tier 3)

### PWR RO Examination Outline

Printed: 03/16/2011

**Facility:** South Texas Project

**Form ES-401-3**

<u>Generic Category</u>	<u>KA</u>	<u>KA Topic</u>	<u>Imp.</u>	<u>Points</u>
<b>Conduct of Operations</b>	2.1.5	Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.	2.9*	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
	2.1.18	Ability to make accurate, clear, and concise logs, records, status boards, and reports.	3.6	1
	<b>Category Total:</b>			<b>3</b>
<b>Equipment Control</b>	2.2.14	Knowledge of the process for controlling equipment configuration or status.	3.9	1
	2.2.41	Ability to obtain and interpret station electrical and mechanical drawings.	3.5	1
	<b>Category Total:</b>			<b>2</b>
<b>Radiation Control</b>	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.	3.2	1
	2.3.5	Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personal monitoring equipment, etc.	2.9	1
	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.	3.4	1
	<b>Category Total:</b>			<b>3</b>
<b>Emergency Procedures/Plan</b>	2.4.9	Knowledge of low power /shutdown implications in accident (e.g. LOCA or loss of RHR) mitigation strategies.	3.8	1
	2.4.26	Knowledge of facility protection requirements, including fire brigade and portable fire fighting equipment usage.	3.1	1
	<b>Category Total:</b>			<b>2</b>
<b>Generic Total:</b>			<b>10</b>	

**Facility:** South Texas Project

Printed: 03/16/2011

Date Of Exam: 09/22/2011

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	2		2	4
	Tier Totals	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**

Printed: 03/16/2011

**Facility:** South Texas Project

**ES - 401**

**Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1**

**Form ES-401-2**

<b>E/APE # / Name / Safety Function</b>	<b>K1</b>	<b>K2</b>	<b>K3</b>	<b>A1</b>	<b>A2</b>	<b>G</b>	<b>KA Topic</b>	<b>Imp.</b>	<b>Points</b>
000008 Pressurizer Vapor Space Accident / 3					X		AA2.27 - Effects on indicated PZR pressure and/or level of sensing line leakage	3.2	1
000015/000017 RCP Malfunctions / 4					X		AA2.09 - When to secure RCPs on high stator temperatures	3.5	1
000029 ATWS / 1						X	2.1.25 - Ability to interpret reference materials, such as graphs, curves, tables, etc.	4.2	1
000056 Loss of Off-site Power / 6						X	2.4.1 - Knowledge of EOP entry conditions and immediate action steps.	4.8	1
000065 Loss of Instrument Air / 8						X	2.1.39 - Knowledge of conservative decision making practices.	4.3	1
000077 Generator Voltage and Electric Grid Disturbances / 6					X		AA2.07 - Operational status of engineered safety features	4.0	1
<b>K/A Category Totals:</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>Group Point Total:</b>	<b>6</b>	

**PWR SRO Examination Outline**

Printed: 03/16/2011

**Facility:** South Texas Project

**ES - 401**

**Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2**

**Form ES-401-2**

<b>E/APE # / Name / Safety Function</b>	<b>K1</b>	<b>K2</b>	<b>K3</b>	<b>A1</b>	<b>A2</b>	<b>G</b>	<b>KA Topic</b>	<b>Imp.</b>	<b>Points</b>
000001 Continuous Rod Withdrawal / 1						X	2.2.42 - Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	4.6	1
000076 High Reactor Coolant Activity / 9					X		AA2.01 - Location or process point that is causing an alarm	3.2	1
W/E06 Inad. Core Cooling / 4						X	2.1.7 - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.7	1
W/E13 Steam Generator Over-pressure / 4					X		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.4	1
<b>K/A Category Totals:</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>Group Point Total:</b>	<b>4</b>	<b>4</b>

**PWR SRO Examination Outline**

Printed: 03/16/2011

Facility: South Texas Project

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.	Points
004 Chemical and Volume Control								X				A2.33 - Fact that isolating cation demineralizer stops boron dilution and enables restoration of normal boron concentration	3.3	1
006 Emergency Core Cooling								X				A2.03 - System leakage	3.7	1
062 AC Electrical Distribution								X				A2.15 - Consequence of paralleling out-of-phase/mismatch in volts	3.2	1
064 Emergency Diesel Generator											X	2.4.47 - Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	4.2	1
103 Containment											X	2.1.6 - Ability to manage the control room crew during plant transients.	4.8	1
<b>K/A Category Totals:</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>Group Point Total:</b>	<b>5</b>	

**PWR SRO Examination Outline**

Printed: 03/16/2011

**Facility:** South Texas Project

**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.	Points
017 In-core Temperature Monitor								X				A2.02 - Core damage	4.1	1
068 Liquid Radwaste											X	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
079 Station Air								X				A2.01 - Cross-connection with IAS	3.2	1
<b>K/A Category Totals:</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>Group Point Total:</b>	<b>3</b>	

## Generic Knowledge and Abilities Outline (Tier 3)

### PWR SRO Examination Outline

Printed: 03/16/2011

**Facility:** South Texas Project

**Form ES-401-3**

<u>Generic Category</u>	<u>KA</u>	<u>KA Topic</u>	<u>Imp.</u>	<u>Points</u>
<b>Conduct of Operations</b>	2.1.32	Ability to explain and apply system limits and precautions.	4.0	1
	2.1.34	Knowledge of primary and secondary plant chemistry limits.	3.5	1
	<b>Category Total:</b>			<b>2</b>
<b>Equipment Control</b>	2.2.19	Knowledge of maintenance work order requirements.	3.4	1
	2.2.20	Knowledge of the process for managing troubleshooting activities.	3.8	1
	<b>Category Total:</b>			<b>2</b>
<b>Radiation Control</b>	2.3.11	Ability to control radiation releases.	4.3	1
	<b>Category Total:</b>			<b>1</b>
<b>Emergency Procedures/Plan</b>	2.4.9	Knowledge of low power /shutdown implications in accident (e.g. LOCA or loss of RHR) mitigation strategies.	4.2	1
	2.4.27	Knowledge of "fire in the plant" procedure.	3.9	1
	<b>Category Total:</b>			<b>2</b>
<b>Generic Total:</b>				<b>7</b>

## **STP September 2011 Written Exam Outline Generation**

- The South Texas Project used a software product called “NRC KA Exam Generation Program (NKEG)” (version 1.1) to generate the Reactor Operator and Senior Reactor Operator written exam outline. This software is authored by Westinghouse and is distributed through the PWR Owners Group.
- In discussion with Paul Hippley, the PWR Owners Group representative for this software, he confirmed the software does fulfill the criteria for randomly and systematically selecting KAs for the written exam outline in accordance with NUREG 1021, ES-401. For example, the program will:
  - Ensure all systems are selected for use on the outline before selecting a system again.
  - Generate a replacement KA (if a KA is rejected) using the same systematic and random sampling process, thus ensuring all systems are selected at least once before a system is selected again.

Refer to Form ES-401-4 for a summary of rejected KAs.

KAs pre-screened prior to outline generation are attached

# Suppressed K/As

Printed 03/10/2011

Facility: South Texas Project

IMPORTANCE  
RO / SRO

Basis

## 037 Steam Generator (S/G) Tube Leak

### A1 Ability to operate and/or monitor the following as they apply to the Steam Generator Tube Leak:

AA1.02 Condensate exhaust system

NA for STP as there are no actions required to monitor/operate the condensate exhaust system during a SGTR or leak.

## 060 Accidental Gaseous Radwaste Release

### K3 Knowledge of the reasons for the following responses as they apply to the Accidental Gaseous Radwaste Release:

AK3.02 Isolation of the auxiliary building ventilation

STP does not have a procedural or system provision for isolating Aux. Bldg. ventilation in response to gaseous releases.

## 068 Control Room Evacuation

### A1 Ability to operate and/or monitor the following as they apply to the Control Room Evacuation:

AA1.20 Indicators for operation of startup transformer

NA for STP because the Control Room Evac procedure does not address operation of a Startup Transformer.

## 022 Containment Cooling System (CCS)

### K4 Knowledge of CCS design feature(s) and/or interlock(s) which provide for the following:

K4.02 Correlation of fan speed and flowpath changes with containment pressure

STP does not have variable speed fans in the Containment Ventilation system

# Suppressed K/As

Printed 03/10/2011

Facility: South Texas Project

Basis

IMPORTANCE  
RO / SRO

## 025 Ice Condenser System

### **K1 Knowledge of the physical connections and/or cause-effect relationships between the Ice Condenser System and the following systems:**

- K1.01 Containment ventilation
- K1.02 Refrigerant systems
- K1.03 Containment sump system
- K2.01 Containment ventilation fans and dampers
- K2.02 Refrigerant systems
- K2.03 Isolation valves
- K3.01 Containment
- K4.01 Glycol expansion tank levels and ice condenser system containment isolation valves
- K4.02 System control
- K5.01 Relationships between pressure and temperature
- K5.02 Heat transfer
- K5.03 Gas laws
- K6.01 Upper and lower doors of the ice condenser
- A1.01 Temperature chart recorders
- A1.02 Glycol expansion tank level
- A1.03 Glycol flow to ice condenser air handling units
- A2.01 Trip of glycol circulation pumps
- A2.02 High/low floor cooling temperature
- A2.03 Opening of ice condenser doors
- A2.04 Containment isolation
- A2.05 Abnormal glycol expansion tank level
- A2.06 Decreasing ice condenser temperature
- A3.01 Refrigerant system
- A3.02 Isolation valves
- A4.01 Ice condenser isolation valves
- A4.02 Containment vent fans
- A4.03 Glycol circulation pumps
- 2.1.1 Knowledge of conduct of operations requirements.
- 2.1.13 Knowledge of facility requirements for controlling vital / controlled access.
- 2.1.14 Knowledge of criteria or conditions that require plant-wide announcements, such as pump starts, reactor trips, mode changes, etc.
- 2.1.15 Knowledge of administrative requirements for temporary management directives, such as standing orders, night orders, Operations memos, etc.
- 2.1.17 Ability to make accurate, clear, and concise verbal reports.
- 2.1.18 Ability to make accurate, clear, and concise logs, records, status boards, and reports.
- 2.1.19 Ability to use plant computers to evaluate system or component status.
- 2.1.2 Knowledge of operator responsibilities during all modes of plant operation.
- 2.1.20 Ability to interpret and execute procedure steps.
- 2.1.21 Ability to verify the controlled procedure copy.



# Suppressed K/As

Printed 03/10/2011

**Facility:** South Texas Project

Basis

IMPORTANCE  
RO / SRO

## 025 Ice Condenser System

### 2.1 Conduct of Operations

- 2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation.
- 2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc.
- 2.1.26 Knowledge of industrial safety procedures (such as rotating equipment, electrical, high temperature, high pressure, caustic, chlorine, oxygen and hydrogen).
- 2.1.27 Knowledge of system purpose and/or function.
- 2.1.28 Knowledge of the purpose and function of major system components and controls.
- 2.1.29 Knowledge of how to conduct system lineups, such as valves, breakers, switches, etc.
- 2.1.3 Knowledge of shift or short-term relief turnover practices.
- 2.1.30 Ability to locate and operate components, including local controls.
- 2.1.31 Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup.
- 2.1.32 Ability to explain and apply system limits and precautions.
- 2.1.34 Knowledge of primary and secondary plant chemistry limits.
- 2.1.35 Knowledge of the fuel-handling responsibilities of SROs.
- 2.1.36 Knowledge of procedures and limitations involved in core alterations.
- 2.1.37 Knowledge of procedures, guidelines, or limitations associated with reactivity management.
- 2.1.38 Knowledge of the station's requirements for verbal communications when implementing procedures.
- 2.1.39 Knowledge of conservative decision making practices.
- 2.1.4 Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, "no-solo" operation, maintenance of active license status, 10CFR55, etc.
- 2.1.40 Knowledge of refueling administrative requirements.
- 2.1.41 Knowledge of the refueling process.
- 2.1.42 Knowledge of new and spent fuel movement procedures.
- 2.1.43 Ability to use procedures to determine the effects on reactivity of plant changes, such as reactor coolant system temperature, secondary plant, fuel depletion, etc.
- 2.1.45 Ability to identify and interpret diverse indications to validate the response of another indication.
- 2.1.5 Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.
- 2.1.6 Ability to manage the control room crew during plant transients.
- 2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.
- 2.1.8 Ability to coordinate personnel activities outside the control room.
- 2.1.9 Ability to direct personnel activities inside the control room.
- 2.2.11 Knowledge of the process for controlling temporary design changes.
- 2.2.12 Knowledge of surveillance procedures.
- 2.2.13 Knowledge of tagging and clearance procedures.
- 2.2.14 Knowledge of the process for controlling equipment configuration or status.

# Suppressed K/As

Printed 03/10/2011

Facility: South Texas Project

Basis

IMPORTANCE  
RO / SRO

## 025 Ice Condenser System

### 2.2 Equipment Control

- 2.2.15 Ability to determine the expected plant configuration using design and configuration control documentation, such as drawings, line-ups, tagouts, etc.
- 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.
- 2.2.18 Knowledge of the process for managing maintenance activities during shutdown operations, such as risk assessments, work prioritization, etc.
- 2.2.19 Knowledge of maintenance work order requirements.
- 2.2.2 Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.
- 2.2.20 Knowledge of the process for managing troubleshooting activities.
- 2.2.21 Knowledge of pre- and post-maintenance operability requirements.
- 2.2.22 Knowledge of limiting conditions for operations and safety limits.
- 2.2.23 Ability to track Technical Specification limiting conditions for operations.
- 2.2.25 Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.
- 2.2.35 Ability to determine Technical Specification Mode of Operation.
- 2.2.36 Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.
- 2.2.37 Ability to determine operability and/or availability of safety related equipment.
- 2.2.38 Knowledge of conditions and limitations in the facility license.
- 2.2.39 Knowledge of less than or equal to one hour Technical Specification action statements for systems.
- 2.2.40 Ability to apply Technical Specifications for a system.
- 2.2.41 Ability to obtain and interpret station electrical and mechanical drawings.
- 2.2.43 Knowledge of the process used to track inoperable alarms.
- 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.
- 2.2.5 Knowledge of the process for making design or operating changes to the facility.
- 2.2.6 Knowledge of the process for making changes to procedures.
- 2.2.7 Knowledge of the process for conducting special or infrequent tests.
- 2.3.11 Ability to control radiation releases.
- 2.3.12 Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.
- 2.3.13 Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.
- 2.3.14 Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.
- 2.3.15 Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.
- 2.3.4 Knowledge of radiation exposure limits under normal or emergency conditions.

# Suppressed K/As

Printed 03/10/2011

**Facility:** South Texas Project

Basis

IMPORTANCE  
RO / SRO

## 025 Ice Condenser System

### 2.3 Radiation Control

- 2.3.5 Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personal monitoring equipment, etc.
- 2.3.6 Ability to approve release permits.
- 2.3.7 Ability to comply with radiation work permit requirements during normal or abnormal conditions.
- 2.4.1 Knowledge of EOP entry conditions and immediate action steps.
- 2.4.11 Knowledge of abnormal condition procedures.
- 2.4.12 Knowledge of general operating crew responsibilities during emergency operations.
- 2.4.13 Knowledge of crew roles and responsibilities during EOP usage.
- 2.4.14 Knowledge of general guidelines for EOP usage.
- 2.4.16 Knowledge of EOP implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, and severe accident management guidelines.
- 2.4.17 Knowledge of EOP terms and definitions.
- 2.4.18 Knowledge of the specific bases for EOPs.
- 2.4.19 Knowledge of EOP layout, symbols, and icons.
- 2.4.2 Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.
- 2.4.20 Knowledge of operational implications of EOP warnings, cautions, and notes.
- 2.4.21 Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.
- 2.4.22 Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.
- 2.4.23 Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.
- 2.4.25 Knowledge of fire protection procedures.
- 2.4.26 Knowledge of facility protection requirements, including fire brigade and portable fire fighting equipment usage.
- 2.4.27 Knowledge of "fire in the plant" procedure.
- 2.4.28 Knowledge of procedures relating to a security event (non-safeguards information).
- 2.4.29 Knowledge of the emergency plan.
- 2.4.3 Ability to identify post-accident instrumentation.
- 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.
- 2.4.31 Knowledge of annunciator alarms, indications, or response procedures.
- 2.4.32 Knowledge of operator response to loss of all annunciators.
- 2.4.34 Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.
- 2.4.35 Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects.
- 2.4.37 Knowledge of the lines of authority during implementation of the emergency plan.

# Suppressed K/As

Printed 03/10/2011

Facility: South Texas Project

Basis

IMPORTANCE  
RO / SRO

## 025 Ice Condenser System

### 2.4 Emergency Procedures/Plan

- 2.4.38 Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required.
- 2.4.39 Knowledge of RO responsibilities in emergency plan implementation.
- 2.4.4 Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.
- 2.4.40 Knowledge of SRO responsibilities in emergency plan implementation.
- 2.4.41 Knowledge of the emergency action level thresholds and classifications.
- 2.4.42 Knowledge of emergency response facilities.
- 2.4.43 Knowledge of emergency communications systems and techniques.
- 2.4.44 Knowledge of emergency plan protective action recommendations.
- 2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm.
- 2.4.46 Ability to verify that the alarms are consistent with the plant conditions.
- 2.4.47 Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.
- 2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.
- 2.4.5 Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions.
- 2.4.50 Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.
- 2.4.6 Knowledge of EOP mitigation strategies.
- 2.4.8 Knowledge of how abnormal operating procedures are used in conjunction with EOPs.
- 2.4.9 Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.

## 033 Spent Fuel Pool Cooling System (SFPCS)

### K4 Knowledge of Spent Fuel Pool Cooling System design feature(s) and/or interlock(s) which provide for the following:

- K4.05 Adequate SDM (boron concentration) At STP there are no design features associated with Spent Fuel Pool Cooling that ensure adequate SDM (boron) is maintained.

## 041 Steam Dump System (SDS) and Turbine Bypass Control

### K2 Knowledge of bus power supplies to the following:

- K2.01 ICS, normal and alternate power supply STP does not have an ICS

# Suppressed K/As

Printed 03/10/2011

Facility: South Texas Project

IMPORTANCE

Basis

RO / SRO

## 063 D.C. Electrical Distribution System

### **K4 Knowledge of D.C. Electrical System design feature(s) and/or interlock(s) which provide for the following:**

K4.04 Trips At STP there are no trips associated with the DC electrical distribution system or its components.

## 103 Containment System

### **2.1 Conduct of Operations**

2.1.15 Knowledge of administrative requirements for temporary management directives, such as standing orders, night orders, Operations memos, etc. Suppressed per NUREG 1021, ES-401.D.1.b

#### **Generic**

### **2.2 Equipment Control**

2.2.43 Knowledge of the process used to track inoperable alarms. STP does not have a specific method to track inoperable alarms other than the Corrective Action Program.

ES-301

## Administrative Topics Outline

Form ES-301-1

Facility: <u>South Texas Project</u>		Date of Examination: 9/26/2011
Examination Level (circle one): <b>RO</b> / SRO		Operating Test Number: 1 (NRC)
Administrative Topic (see Note)	Type Code*	Describe activity to be performed:
A1-Conduct of Operations	R, M	Calculate RCS refill volume (without vacuum) 2.1.25 (3.9) Ability to interpret reference materials, such as graphs, curves, tables, etc.
A2-Conduct of Operations	R, D	Determine Reactor Vessel water level 2.1.23 (4.3) Ability to perform specific system and integrated plant procedures during all modes of operation.
A3-Equipment Control	R, N	Verify Excore QPTR calculation 2.2.12 (3.7) Knowledge of surveillance procedures
A4-Radiation Control	R, P, D	Stay time determination with entry requirements 2.3.4 (3.2) Knowledge of radiation exposure limits under normal or emergency conditions.
Emergency Plan		
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.		
*Type Codes and Criteria: (C)ontrol Room; (S)imulator; Class(R)oom (D)irect from bank ( $\leq 3$ for ROs; $\leq 4$ for SROs & RO retakes) (N)ew or (M)odified from bank ( $\geq 1$ ) (P)revious 2 exams ( $\leq 1$ ; randomly selected)		

ES-301

## Administrative Topics Outline

Form ES-301-1

Facility: <u>South Texas Project</u>		Date of Examination: 9/26/2011
Examination Level (circle one): RO <b>(SRO)</b>		Operating Test Number: 1 (NRC)
Administrative Topic (see Note)	Type Code*	Describe activity to be performed:
A5-Conduct of Operations	R, D	Review SDM calculation 2.1.20 (4.6) Ability to interpret and execute procedure steps.
A6-Conduct of Operations	R, M	Review RCS Inventory and determine Technical Specification applicability 2.1.7 (4.7) Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.
A7-Equipment Control	R, M	Determine Technical Specification action for abnormal RCS activity 2.2.22 (4.7) Knowledge of limiting conditions for operation and safety limits.
A8-Radiation Control	R, P, D	Determine personnel exposure limits 2.3.4 (3.7) Knowledge of radiation exposure limits under normal or emergency conditions.
A9-Emergency Plan	R, N	Determine appropriate Protective Action Recommendation 2.4.44 (4.4) Knowledge of emergency plan protective action recommendations.
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.		
*Type Codes and Criteria: (C)ontrol Room; (S)imulator; 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)		

## ES-301-1

- (A1) Determine the volume of water needed to fill the RCS from a mid-loop condition and the expected final RWST level. This task was modified to be performed using data with the RCS not under vacuum.
- (A2) Verification of a Reactor Vessel water level determination made in accordance with OPOP02-II-0002, RVWL Monitoring System.
- (A3) Perform an independent verification of a Quadrant Power Tilt Ratio surveillance in accordance with OPSP010-NI-0002, Excore QPTR Determination.
- (A4) Determine stay-time based on administrative limits for a job in a high radiation area. Entry requirements will also be incorporated into the task.
- (A5) Review a completed shutdown margin calculation.
- (A6) Review a completed RCS inventory surveillance and determine Tech Spec applicability based on the results. Task was modified such that the included error is changed and the end result is that once the error is corrected, acceptance criteria are now not met (the original task was the opposite).
- (A7) Determine required Tech Spec actions based on given RCS activity. This task is modified such that a different parameter in the activity spec is out of tolerance.
- (A8) Determine personnel exposure margins during an emergency.
- (A9) Determine the correct Protective Action Recommendation in accordance with the emergency plan procedures based on the given conditions.



Facility: <u>South Texas Project</u>		Date of Examination:
Exam Level: RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>		Operating Test No.: <u>LOT 18 NRC Exam</u>
<b>Control Room Systems (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)</b>		
System / JPM Title	Type Code*	Safety Function
a. (S1) Monthly Control Rod Operability KA: 001 A2.03 (3.5/4.2)	A,D,S	1
b. (S2) Respond to FHB Rad Monitor Alarm KA: 072 A3.01 (2.9*/3.1)	A,D,EN,S	7
c. (S3) Isolate SI Accumulators KA: 006 A4.02 (4.0*/3.8)	A,D,L,S	2
d. (S4) Roll 13.8KV Electrical Buses KA: 062 A4.07 (3.1*/3.1*)	D,L,S	6
e. (S5) Xfer MFW from MFRV to LPFRV KA: 059 A4.03 (2.9*/2.9)	N,S	4S
f. (S6) Respond to ECW Low Disc. Press. KA: 008 A4.01 (3.3/3.1)	A,D,EN,S	8
g. (C1) Transfer to Hot Leg Recirc. KA: 006 A4.05 (3.9/3.8)	C,D,EN,P	3
h. (C2) Respond to RCB High Rad. KA: W/E16 EA2.1 (2.9/3.1)	C,D,L	9
<b>In-Plant Systems® (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)</b>		
i. (P1) Locally Trip the Reactor KA: 002 A2.04 (4.3/4.6)	A,D,E	4P
j. (P2) Fill SFP from RWST KA: 033 A1.01 (2.7/3.3)	N,R	8
k. (P3) Perform 0POP05-EO-EC00 Add. #4 KA: 062 A4.04 (2.6/2.7)	E,L,N	6
All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SROU systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.		
*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 Features	- / - / ≥ 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>South Texas Project</u>		Date of Examination:	
Exam Level: RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>		Operating Test No.: <u>LOT 18 NRC Exam</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. (S1) Monthly Control Rod Operability KA: 001 A2.03 (3.5/4.2)	A,D,S	1	
b. (S2) Respond to FHB Rad Monitor Alarm KA: 072 A3.01 (2.9*/3.1)	A,D,EN,S	7	
c. (S3) Isolate SI Accumulators KA: 006 A4.02 (4.0*/3.8)	A,D,L,S	2	
d.			
e. (S5) Xfer MFW from MFRV to LPFRV KA: 059 A4.03 (2.9*/2.9)	N,S	4S	
f. (S6) Respond to ECW Low Disc. Press. KA: 008 A4.01 (3.3/3.1)	A,D,EN,S	8	
g. (C1) Transfer to Hot Leg Recirc. KA: 006 A4.05 (3.9/3.8)	C,D,EN,P	3	
h. (C2) Respond to RCB High Rad. KA: W/E16 EA2.1 (2.9/3.1)	C,D,L	9	
In-Plant Systems® (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)			
i. (P1) Locally Trip the Reactor KA: 002 A2.04 (4.3/4.6)	A,D,E	4P	
j. (P2) Fill SFP from RWST KA: 033 A1.01 (2.7/3.3)	N,R	8	
k. (P3) Perform 0POP05-EO-EC00 Add. #4 KA: 062 A4.04 (2.6/2.7)	E,L,N	6	
All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SROU systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.			
*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 Features	- / - / ≥ 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>South Texas Project</u>		Date of Examination:
Exam Level: RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/>		Operating Test No.: <u>LOT 18 NRC Exam</u>
<b>Control Room Systems (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)</b>		
System / JPM Title	Type Code*	Safety Function
a. (S1) Monthly Control Rod Operability KA: 001 A2.03 (3.5/4.2)	A,D,S	1
b. (S2) Respond to FHB Rad Monitor Alarm KA: 072 A3.01 (2.9*/3.1)	A,D,EN,S	7
c.		
d.		
e.		
f.		
g.		
h.		
<b>In-Plant Systems® (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)</b>		
i. (P1) Locally Trip the Reactor KA: 002 A2.04 (4.3/4.6)	A,D,E	4P
j. (P2) Fill SFP from RWST KA: 033 A1.01 (2.7/3.3)	N,R	8
k. (P3) Perform 0POP05-EO-EC00 Add. #4 KA: 062 A4.04 (2.6/2.7)	E,L,N	6
All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SROU systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.		
*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 Features	- / - / ≥ 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		

**S1 and S2 Simulator Setup (IC-215) - 100% Power with all systems in a normal alignment. RT-8035 is in alarm (RM11) (ACKNOWLEDGE the AUDIBLE Alarm but DO NOT ACKNOWLEDGE the flashing light for RT-8035). No other RM-11 alarms are in.**

S1 - Perform 0PSP03-RS-0001, Monthly Control Rod Operability, on Control Bank (C) following the corrective maintenance. Determine that Control Bank Rod K-6 drops and performs the Immediate Actions of 0POP04-RS-0001, Control Rod Malfunction. This is an Alternate Path JPM.

S2 - Respond to FHB Rad Monitor Alarm per 0POP04-RA-0001, Radiation Monitoring System Alarm Response, and take appropriate action. Determine that FHB HVAC has not properly actuated and manually align FHB HVAC. This is an Alternate Path JPM.

**S3 and S4 Simulator Setup (IC-216) - Mode 3 with RCS Temperature between 440°F and 450°F. RCS Pressure is between 900 and 1000 psig.**

S3 - CLOSE Safety Injection Accumulator Discharge Valves in accordance with 0POP03-ZG-0007, Plant Cooledown. SI Accumulator Discharge Valves for 'A' and 'B' Accumulators will close Accumulator 'C' has to be vented. This is an Alternate Path JPM.

S4 - Roll Electrical Buses in preparation for de-energizing the 13.8KV Main and Aux Transformers.

**S5 and S6 Simulator Setup (IC-217) - About 18% Power with Main Turbine still on line. Start-Up SGFP 14 Running. All SGFPTs on turning gear. 'A' and 'C' ECW in service. ESF D/G #11 is running at the 25% load hold point for a Surveillance Test.**

S5 - Transfer Main Feedwater from MFRVs to LPFRVs per Step 5.21 and Addendum 8 of 0POP03-ZG-0006, Plant Shutdown from 100% to Hot Standby.

S6 - Start ECW Pump 'B' in preparation to secure 'C' for maintenance. While starting ECW Pump 'B', ECW Pump 'A' develops a sheared shaft. Perform actions of 0POP09-AN-02M3, Window D-7, 'ECW PUMP 1A DISCH PRESS LO' and secure ESF D/G #11. This is an Alternate Path JPM.

**C1** - Transfer to Hot Leg Recirculation on SI Train 'A' and then Train 'B' in accordance with 0POP05-EO-ES14, Transfer to Hot Leg Recirculation.

**C2** - Respond to an RCB High Rad condition using 0POP05-EO-FRZ3, Response to High Containment Radiation Level, verifies Containment is isolated and places Containment Carbon Filter Units in service.

**P1** - Perform the remainder of Immediate Action Step 1.0 of 0POP05-EO-FRS1, Response to Nuclear Power Generation - ATWS, and SIMULATE opening the Reactor Trip Breakers. This is an Alternate Path JPM.

**P2** - Perform a fill of the SFP per 0POP02-FC-0001, SFP Cooling and Cleanup System, using the RWST.

**P3** - Perform 0POP05-EO-EC00, Loss of all AC Power, Addendum #4, Vital DC Bus Monitoring.

FACILITY: SOUTH TEXAS PROJECT

DATE OF EXAM: 09/2011

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 <sup>(*)</sup>		
		1			2			3			4				R	I	U
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		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				
Crew A	RX														1	1	0
	NOR	1													1	1	1
	I/C	2,3 4,6													4	4	2
	MAJ	5													1	2	1
	TS	2,4													2	0	2
RO <input type="checkbox"/>	RX		1												1	1	0
	NOR				1										1	1	1
	I/C		2,4,6		2,3 4,6										7	4	2
	MAJ		5		5										2	2	1
	TS				1,3										2	0	2
RO <input checked="" type="checkbox"/>	RX			1											1	1	0
	NOR				1										1	1	1
	I/C			3,6	3,4										4	4	2
	MAJ			5	5										2	2	1
	TS														0	2	2
RO <input type="checkbox"/>	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2

Instructions:

1. 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.
2. 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.
3. 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: SOUTH TEXAS PROJECT  
NO.: 1

DATE OF EXAM: 09/2011

OPERATING TEST

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				R	I	U
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		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				
Crew B	RX														1	1	0
	RO <input type="checkbox"/>	NOR	1												1	1	1
	SRO-I <input type="checkbox"/>	I/C	2,3 4,6												4	4	2
	SRO-U <input checked="" type="checkbox"/>	MAJ	5												1	2	1
		TS	2,4												2	0	2
RO <input type="checkbox"/>	RX		1												1	1	0
	NOR							1							1	1	1
	SRO-I <input checked="" type="checkbox"/>	I/C		2,4,6				2,3,4 5,7							8	4	2
	SRO-U <input type="checkbox"/>	MAJ		5				6							2	2	1
		TS						2,3							2	0	2
RO <input checked="" type="checkbox"/>	RX			1											1	1	0
	NOR															1	1
	SRO-I <input type="checkbox"/>	I/C			3,6				2,3 4,5						6	4	2
	SRO-U <input type="checkbox"/>	MAJ			5				6						2	2	1
		TS														0	2
RO <input type="checkbox"/>	RX														1	1	0
	NOR															1	1
	SRO-I <input type="checkbox"/>	I/C													4	4	2
	SRO-U <input type="checkbox"/>	MAJ													2	2	1
		TS														0	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: SOUTH TEXAS PROJECT  
NO.: 1

DATE OF EXAM: 09/2011

OPERATING TEST

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				R	I	U	
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION							
		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					
Crew C	RX														1	1	0	
	RO <input type="checkbox"/>	NOR	1						1						2	1	1	1
	SRO-I <input type="checkbox"/>	I/C	2,3 4,6						2,3,4 5,7						9	4	4	2
	SRO-U <input checked="" type="checkbox"/>	MAJ	5						6						2	2	2	1
		TS	2,4						2,3						4	0	2	2
RO <input checked="" type="checkbox"/>	RX			1											1	1	1	0
	SRO-I <input type="checkbox"/>	I/C			3,6				2,3 4,5						6	4	4	2
	SRO-U <input type="checkbox"/>	MAJ			5				6						2	2	2	1
		TS														0	2	2
	RO <input checked="" type="checkbox"/>	RX		1											1	1	1	0
SRO-I <input type="checkbox"/>	NOR								1						1	1	1	1
	I/C		2,4,6						3,5,7						6	4	4	2
	MAJ		5						6						2	2	2	1
RO <input type="checkbox"/>	RX														1	1	0	
	SRO-I <input type="checkbox"/>	I/C													4	4	2	
	SRO-U <input type="checkbox"/>	MAJ													2	2	1	
		TS													0	2	2	

Instructions:

5. 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.
6. 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.
3. 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: SOUTH TEXAS PROJECT  
NO.: 1

DATE OF EXAM: 09/2011

OPERATING TEST

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			R		I	U		
		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						
<b>Crew D</b>																			
RO <input type="checkbox"/>	RX																1	1	0
	NOR	1														1	1	1	
SRO-I <input checked="" type="checkbox"/>	I/C	2,3 4,6							2,3 4,5							8	4	4	2
SRO-U <input type="checkbox"/>	MAJ	5							6							2	2	2	1
	TS	2,4														2	0	2	2
RO <input checked="" type="checkbox"/>	RX		1													1	1	1	0
	NOR									1						2	1	1	1
SRO-I <input type="checkbox"/>	I/C		2,4, 6							3,5,7						6	4	4	2
SRO-U <input type="checkbox"/>	MAJ		5							6						2	2	2	1
	TS															0	2	2	2
<b>Crew G</b>																			
RO <input checked="" type="checkbox"/>	RX																1	1	0
	NOR					1										1	1	1	1
SRO-I <input type="checkbox"/>	I/C					3,4							2,3,6			5	4	4	2
SRO-U <input type="checkbox"/>	MAJ					5							4			2	2	2	1
	TS															0	2	2	2
RO <input checked="" type="checkbox"/>	RX																1	1	0
	NOR																1	1	1
SRO-I <input type="checkbox"/>	I/C					2,4,6							1,3 5,6			7	4	4	2
SRO-U <input type="checkbox"/>	MAJ					5							4			2	2	2	1
	TS															0	2	2	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.



**ES-301 Transient and Event Checklist Form ES-301-5**

FACILITY: SOUTH TEXAS PROJECT

DATE OF EXAM: 09/2011

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			R		I	U	
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION							
		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					
Crew E	RX														1	1	0	
	NOR	1				1									2	1	1	
	I/C	2,3 4,6				3,4						1,2, 3 5,6			11	4	4	
	MAJ	5				5						4			3	2	1	
	TS	2,4										1,2			4	0	2	
RO <input type="checkbox"/>	RX		1												1	1	0	
	NOR					1									1	1	1	
	I/C		2,4,6			2,3 4,6						2,3, 6			10	4	4	
	MAJ		5			5						4			3	2	1	
	TS					1,3									2	0	2	
RO <input checked="" type="checkbox"/>	RX			1											1	1	0	
	NOR															1	1	
	I/C			3,6				2,4,6				1,3 5,6			9	4	4	
	MAJ			5				5				4			3	2	1	
	TS														0	2	2	
RO <input type="checkbox"/>	RX															1	0	
	NOR															1	1	
	I/C															4	2	
	MAJ															2	1	
	TS															0	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.

**ES-301 Transient and Event Checklist Form ES-301-5**

FACILITY: SOUTH TEXAS PROJECT

DATE OF EXAM: 09/2011

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			R		I	U	
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION							
		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					
Crew F	RX														1	1	0	
	NOR				1										1	1	1	
	I/C				2,3 4,6				2,3 4,5			1,2,3 5,6			13	4	4	2
	MAJ				5				6			4			3	2	2	1
	TS				1,3							1,2			4	0	2	2
RO <input checked="" type="checkbox"/>	RX														1	1	0	
	NOR					1					1				2	1	1	1
	I/C					3,4					3,5, 7		2,3,6	8	4	4	2	
	MAJ					5					6		4	3	2	2	1	
	TS														0	2	2	
RO <input checked="" type="checkbox"/>	RX														1	1	0	
	NOR														1	1	1	
	I/C						2,4,6					1,3 5,6		7	4	4	2	
	MAJ					5						4		2	2	2	1	
	TS														0	2	2	
RO <input type="checkbox"/>	RX														1	1	0	
	NOR														1	1	1	
	I/C														4	4	2	
	MAJ														2	2	1	
	TS														0	2	2	

**Instructions:**

11. 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.
12. 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.
3. 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: South Texas Project

Scenario No.: 1

Op-Test No.: LOT18 NRC

Examiners:Operators:

Initial Conditions: 75% Power and Stable.

Turnover: At step 7.44 of OPOP03-ZG-0005. Commence raising power to 88-90% at 10%/hr.

Event No.	Malf. No.	Event Type*	Event Description
1 (0 min)	N/A	RO (R) BOP (R) SRO (N)	Raise power from 75% to 88-90%
2 (10 min)	02-20-01 (1)	RO (I) SRO (I, TS)	PRZ Level Channel LT-465 fails high
3 (25 min)	05-14-01 (0.65)	BOP (C) SRO (C)	Feedwater Header Pressure PT-557 fails to an intermediate position
4 (45 min)	02-13-01 (0.6)	RO (C) SRO (C, TS)	PRZ PORV leakage (isolable) after SG levels stabilize.
5 (55 min)	05-03-02 (0.25)	ALL (M)	SGTR on B Steam Generator (~250 gpm) after PORV isolated/Tech Specs addressed <b>(CT)</b>
6 (N/A)	10-02-02 (1) 10-09-02 (1)	RO (C) BOP (C) SRO (C)	Loss of 13.8KV Standby Bus 1G and Train B Sequencer failure (loss of standby bus occurs on RX Trip - integral) <b>(CT)</b>

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5-8)	5
2. Malfunctions after EOP entry (1-2)	1
3. Abnormal events (2-4)	3
4. Major transients (1-2)	1
5. EOPs entered/requiring substantive actions (1-2)	1
6. EOP contingencies requiring substantive actions (0-2)	0
7. Critical tasks (2-3)	2

STP LOT-18  
NRC Scenario #1 Description

**Initial Conditions:** The plant is at 75% power. The crew is at step 7.44 of POP03-ZG-0005, Plant Startup to 100%, with instructions to raise power to 88-90% at 10%/hr.

**Event 1:** The crew is to raise power to 88-90% using POP03-ZG-0005. This is a normal evolution with no malfunctions.

**Event 2:** Controlling PZR level Channel LT-0465 fails high. The crew will respond using POP04-RP-0002, Loss Of Automatic Pressurizer Level Control, to select an alternate channel and stabilize the plant. The SRO will address Tech Spec implications.

**Event 3:** Feedwater header pressure PT-0557 fails to an intermediate position causing all Turbine Driven Steam Generator Feedwater Pumps to slow down. The crew will respond and stabilize the plant using POP04-FW-0002, Steam Generator Feed Pump Trip.

**Event 4:** After the crew has stabilized steam generator levels, PZR PORV seat leakage will occur. The crew will respond using POP04-RC-0003, Excessive RCS Leakage, to isolate the leaking PORV and stabilize the plant. The SRO will address Tech Spec implications.

**Event 5:** After the crew has addressed PZR PORV Seat Leakage Tech Spec, a 250 gpm SGTR will develop on SG 1B. The crew may initially respond using POP04-RC-0004, Steam Generator Tube Leakage, however, since the tube rupture is greater than 200 gpm, the crew may go right to POP05-EO-EO00, Reactor Trip or SI, and then to POP05-EO-EO30, Steam Generator Tube Rupture.

**Event 6:** When the Reactor is Tripped, 13.8KV Standby BUS 1G will LOCKOUT with a failure of the Train B Sequencer. Standby DG #12 will automatically start but the crew will have to manually start ESF equipment on Train B. This will be performed using Addendum #5 of POP05-EO-EO00.

**Termination:** The scenario will terminate after the crew performs a RCS depressurization in POP05-EO-EO30.

**Critical Tasks:**

- Manually starts ECW Pump 1B prior to completing Addendum #5 of POP05-EO-EO00 and prior to ESF DG #12 tripping.
- Correctly determine target CET temperature and maintain CET temperatures less than the target CET temperature established for the RCS cooldown in POP05-EO-EO30.

**Source:** New

Facility: South Texas Project

Scenario No.: 2

Op-Test No.: LOT18 NRC

Examiners:Operators:

**Initial Conditions: 48% power and stable. Condensate Pump #13 OOS for Maintenance.**

**Turnover: Tornado Watch is in effect. 0POP04-ZO-0002, Addendum 1 has been completed to step 10. Management has made the decision to hold reactor power at 48% until a current line of thunderstorms moves through the area. Start Train A and secure Train C Control Room HVAC for surveillance testing later in the shift.**

Event No.	Malf. No.	Event Type*	Event Description
1 (0 min)	RP08433 TCC (0)	RO (N) SRO (N, TS)	Swap running CRE HVAC trains. Train A Supply fan will develop a sheared shaft after starting.
2 (10 min)	08-12-05 (1)	BOP (C) SRO (C)	SGFPT #12 trips and SU SGFP #14 fails to auto start.
3 (20 min)	04-01-01 (1)	RO (C) SRO (C, TS)	CCW Pump 1A Trips and CCW Pump 1C fails to Auto Start.
4 (40 min)	AST1 & AST3 (1)	RO (C) BOP (C) SRO (C)	Main Turbine trip below P-9
5 (N/A)	02-01-02 (.0007) (.4)	ALL (M)	308 gpm SBLOCA on Loop B when Steam Dumps are placed in Steam Pressure Mode in POP04-TM-0003. (CT). Leak rate rises after IA OCIV opened in POP05-EO-EO10. (CT)
6 (N/A)	01-12- 16,17,18, 19,22,23, (1)	BOP (C) SRO (C)	Automatic Feedwater Isolation fails following the SI actuation (Integral)

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5-8)	6
2. Malfunctions after EOP entry (1-2)	1
3. Abnormal events (2-4)	3
4. Major transients (1-2)	1
5. EOPs entered/requiring substantive actions (1-2)	2
6. EOP contingencies requiring substantive actions (0-2)	1
7. Critical tasks (2-3)	2

STP LOT-18  
NRC Scenario #2 Description

**Initial Conditions:** 48% power and stable. Condensate Pump #13 OOS for Maintenance. Tornado Watch is in effect. 0POP04-ZO-0002, Addendum 1 has been completed to step 10. Management has made the decision to hold reactor power at 48% until a current line of thunderstorms moves through the area. Start Train A and secure Train C Control Room HVAC for surveillance testing later in the shift.

**Event 1:** Train A CRE HVAC Supply Fan will develop a sheared shaft after starting. The crew will respond to the POP09 for the associated trouble alarm. The POP09 will have the crew secure Train A CRE HVAC. The SRO will address Tech Spec implications.

**Event 2:** SGFPT #12 trips with the SU SGFP #14 failing to start. The crew will respond and stabilize the plant using POP04-FW-0002, Steam Generator Feed Pump Trip.

**Event 3:** CCW Pump 1A trips and CCW Pump 1C fails to auto start. The POP09 for CCW Pump 1A trip will have the crew ensure that CCW Pump 1C has started. Depending on the CCW pressure perturbation, the crew may have to also respond to a loss of CCW to the RCP Thermal Barriers. The SRO will address Tech Spec implications.

**Event 4:** After the crew has addressed CCW Pump Tech Spec, a Main Turbine trip will occur. The crew will respond and stabilize the plant using POP04-TM-0003, Main Turbine Trip Below P-9.

**Event 5:** When the crew places Steam Dumps in the Steam Pressure Mode per POP04-TM-0003, Main Turbine Trip Below P-9, a 300 gpm SBLOCA will develop on LOOP B. The crew may initially respond using POP04-RC-0003, Excessive RCS Leakage, however, since the leak is greater than 200 gpm, the crew may go right to POP05-EO-EO00, Reactor Trip or SI, and then to POP05-EO-EO10, Loss of Reactor or Secondary Coolant. The leak will rise to a LBLOCA after the crew opens the instrument air OCIV in POP05-EO-EO10, requiring the crew to enter and perform the actions of POP05-EO-FRZ1, Response to High Containment Pressure.

**Event 6:** Feedwater Isolation will fail to automatically actuate after receiving the SI signal. The operator will have to manually align feedwater using Addendum #5 of POP05-EO-EO00.

**Termination:** The scenario will be terminated after the crew manually starts 2 CS Pumps per POP05-EO-FRZ1, Response to High Containment Pressure.

**Critical Tasks:**

- Depressurize intact SGs to less than 1000 psig within 45 minutes of the initiation of the SBLOCA.
- Manually start CS Pumps to address RCB pressure prior to exiting POP05-EO-FRZ1.

**Source:** New

Facility: South Texas Project

Scenario No.: 3

Op-Test No.: LOT18 NRC

Examiners:Operators:

**Initial Conditions: 100% Power and Stable. LPHD Pump #13 and RCFC 12C are OOS.**

**Turnover: LPHD Pump #13 has been repaired and is ready to be placed back in service. When LPHD Pump #13 is in service, secure Condensate Pump #13.**

Event No.	Malf. No.	Event Type*	Event Description
1 (0 min)	(N/A)	BOP (N) SRO (N)	Return a Low Pressure Heater Drip Pump to service.
2 (15 min)	09-02-01 (true)	RO (C) SRO (C, TS)	RCFC Fan 11A trips 3 minutes after the Heater Drip Pump level control valve is placed in auto (integral).
3 (25 min)	06-16-02 (0)	RO (I) BOP (I) SRO (I, TS)	PT-505 (Turbine Impulse Pressure) fails low. <b>(CT)</b>
4 (35 min)	03-10-01 (0.1)	RO (C) SRO (C)	Charging line leak in Containment.
5 (50 min)	10-06-01 (1)	RO (C) BOP (C) SRO (C)	Loss of load (Generator output breaker opens) 2 minutes after the charging line isolation valve is closed (integral).
6 (N/A)	05-04-01 (1)	ALL (M)	Steam Generator 1A Safety Valve fails open 10 seconds after the reactor trips. (Integral) <b>(CT)</b>
7 (N/A)	01-12-04A (1)	BOP (I) SRO (I)	Phase 'A', Train 'A' fails to actuate. (auto and manual)

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5–8)	6
2. Malfunctions after EOP entry (1–2)	1
3. Abnormal events (2–4)	3
4. Major transients (1–2)	1
5. EOPs entered/requiring substantive actions (1–2)	1
6. EOP contingencies requiring substantive actions (0–2)	0
7. Critical tasks (2–3)	2

STP LOT-18  
NRC Scenario #3 Description

**Initial Conditions:** 100% Power and Stable. LPHD Pump #13 and RCFC 12C are OOS. LPHD Pump #13 has been repaired and is ready to be placed back in service.

**Event 1:** The crew will start LPHD Pump #13 and place in service. The crew will then proceed to secure Condensate Pump #13 as it is no longer needed. This is a normal evolution with no malfunctions.

**Event 2:** 3 minutes after LPHD Pump #13 is placed in auto, RCFC Fan 11A will have a sheared shaft. A Low Fan DP Alarm will have the crew secure RCFC Fan 11A and evaluate starting the only other available RCFC Fan 11C. Containment Pressure will rise and may bring in an RCB Pressure High Alarm if RCFC Fan 11C is not started. The SRO will address Tech Spec implications.

**Event 3:** After addressing RCFC Fan Tech Specs, PT-0505, a Turbine Impulse Pressure Channel, will fail low. The crew will respond using OPOP04-TM-0004, Failure of Turbine Impulse Pressure Transmitter (PT-505/506). The SRO will address Tech Spec implications.

**Event 4:** After addressing Tech Specs for PT-0505 failure, a CVCS charging line leak will develop in Containment. The crew will respond using OPOP04-RC-0003, Excessive RCS Leakage, and will be able to identify and isolate the leak.

**Event 5:** 2 minutes after the charging line is isolated, the main generator output breaker will open causing a total loss of load. An automatic reactor trip will likely occur since steam dumps are in steam pressure mode due to the PT-505 failure. The crew will respond using POP05-EO-EO00, Reactor Trip or Safety Injection

**Event 6:** 10 seconds after the reactor trip, a safety valve on SG 1A will fail open (due to pressure spike caused by loss of load), resulting in a faulted steam generator. The crew will respond using POP05-EO-EO20, Faulted Steam Generator Isolation.

**Event 7:** On the SI, Phase A on Train A will fail to actuate and can not be manually actuated. The crew will respond using Addendums 1 and 5 of OPOP05-EO-EO00, Reactor Trip or SI, which will require manually isolating any penetrations that are normally isolated by the Phase A signal.

**Termination:** The scenario will be terminated when POP05-EO-EO20 is exited.

**Critical tasks:**

- Place control rods in manual prior to receiving an automatic reactor trip following the failure of PT-505.
- Isolate feed and steam lines to steam generator 1A prior to exiting POP05-EO-EO20.

**Source:** New



Facility: South Texas Project

Scenario No.: 4

Op-Test No.: LOT18 NRC

Examiners:Operators:

**Initial Conditions: 100% Power and Stable. Train B work week with ECW, D/G, CCW, SI, and AFW inoperable. SG 1B LT-0528 (CH 3) is in the Tripped condition.**

**Turnover: All Tech Spec actions are complete with the ESF Power Availability surveillance (PSP03-EA-0002) being due in 6 hours. Continuing Train 'B' Work Week. I/C is continuing to trouble shoot SG 1B LT-0528. The level transmitter has been inoperable for the last 4 days and is currently in the Tripped condition per Tech. Specs.**

Event No.	Malf. No.	Event Type*	Event Description
1 (1 min)	02-19-03 (0)	RO (I) SRO (I, TS)	PRZ Pressure Channel PT0457 fails low
2 (15 min)	05-22-01 (1)	BOP (I) SRO (I, TS)	SG 1A Steam Pressure PT-0514 fails high.
3 (30 min)	10-11-01 (1)	ALL (C)	Lockout of 4.16KV Bus E1A
4 (N/A)	05-20-08 (0)	ALL (M)	Inadvertent FWI when SG 1B CH 4 HI-Hi Bistable comes in. (8 minutes after DG 11 is placed in PTS - integral)
5 (N/A)	06-02-01 (1)	RO (C) SRO (C)	Main Turbine fails to auto trip. (integral) <b>(CT)</b>
6 (N/A)	08-03-03 (1) 08-02-01 (1)	ALL (C)	AFW Pump C trips 3 minutes after start and AFW Pump D overspeeds upon starting creating a Loss of Heat Sink condition. (integral) <b>(CT)</b>

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5-8)	6
2. Malfunctions after EOP entry (1-2)	2
3. Abnormal events (2-4)	3
4. Major transients (1-2)	1
5. EOPs entered/requiring substantive actions (1-2)	1
6. EOP contingencies requiring substantive actions (0-2)	1
7. Critical tasks (2-3)	2

STP LOT-18  
NRC Scenario #4 Description

**Initial Conditions:** The plant is at 100% power. A Train 'B' work week is in progress with Train 'B' ECW, D/G, CCW, SI and AFW inoperable for maintenance. All Tech Spec actions are complete with the ESF Power Availability surveillance (PSP03-EA-0002) being due in 6 hours. SG 1B LT-0528 (CH 3) has been inoperable for the past 4 days and is in the tripped condition as required by Tech Specs.

**Event 1:** Controlling PZR Pressure Channel PT-0457 fails low. Operators will take action in accordance with POP04-RP-0001, Loss of Automatic Pressurizer Pressure Control, to stabilize the plant and select an alternate channel. The SRO will address Tech Spec implications.

**Event 2:** SG 1A Steam Pressure for the controlling steam flow channel, PT-0514, fails high. Operators will stabilize the plant and select an alternate channel in accordance with POP04-FW-0001, Loss of Steam Generator Level Control. The SRO will address Tech Spec implications.

**Event 3:** Lockout of 4.16KV bus E1A. The crew will stabilize the plant and take action in accordance with POP04-AE-0001, First Response To Loss Of Any Or All 13.8KV Or 4.16KV Bus. The next event will automatically occur 8 minutes after ESF DG #11 is placed in Pull-To-Stop.

**Event 4/5:** Inadvertent Feedwater Isolation occurs when a 2<sup>nd</sup> Hi-Hi level bistable trips on SG 1B. A reactor trip occurs, however the main turbine fails to automatically trip. The crew will perform the actions of POP05-EO-EO00, Reactor Trip or Safety Injection, trip the main turbine and stabilize the plant.

**Event 6:** Upon start, AFW Pump #14 trips on overspeed. AFW Pump #13 trips on overcurrent 3 minutes after start. This creates a loss of Heat Sink condition. When directed by the EOP to implement Functional Restoration Procedures, the crew will transition to POP05-EO-FRH1, Response to Loss Of Secondary Heat Sink, to address the loss of heat sink condition.

**Termination:** The scenario will terminate after feed and bleed is established in POP05-EO-FRH1 (completion of step 13).

**Critical Tasks:**

- Manually trips the main turbine prior to transition out of POP05-EO-EO00.
- Establishes feed and bleed of the RCS prior to transition out of POP05-EO-FRH1.

**Source:** New

Facility: South Texas Project

Scenario No.: BU

Op-Test No.: LOT18 NRC

Examiners:Operators:

**Initial Conditions: 75% power and holding for completion of FWBP work to correct a common mode motor problem. Circulating Water Pump #11 and Containment Spray Pump 'A' are out of service for maintenance.**

**Turnover: Start FWBP #13 and secure FWBP #11 to allow maintenance on the last FWBP motor.**

Event No.	Malf. No.	Event Type*	Event Description
1 (0 min)	N/A	SRO (N) BOP (N)	Swap Feedwater Booster Pumps
2 (15 min)	14-08-01 (true)	SRO (C, TS) RO (C)	Essential Cooling Water Pump "A" trips without auto start of the standby train.
3 (25 min)	05-12-03 (0)	SRO (I, TS) BOP (I)	SG C controlling level channel (LT-0539) fails low (CT)
4 (35 min)	Thermal OL (true)	SRO (C) RO (R) BOP (C)	Loss of Iso-phase cooling results in down power
5 (50 min)	02-07-02 (true)	All (M)	RCP 'B' sheared shaft after plant stabilized following down power
6 (N/A)	52-LI-37 (18) 52-LI-57 (96)	SRO (C) RO (C)	2 control rods stuck partially out of the core following reactor trip (Integral) (CT)
7 (N/A)	10-08-01 10-11-02 (true)	SRO (C) RO (C)	Loss of offsite power and all ESF diesel generators (Loss of All AC) after boration started in ES01 (Integral) (CT)

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5-8)	6
2. Malfunctions after EOP entry (1-2)	2
3. Abnormal events (2-4)	3
4. Major transients (1-2)	1
5. EOPs entered/requiring substantive actions (1-2)	2
6. EOP contingencies requiring substantive actions (0-2)	1
7. Critical tasks (2-3)	3

STP LOT-18  
NRC Scenario BU Description

**Initial Conditions:** 75% power and holding for completion of FWBP work to correct a common mode motor problem. Circulating Water Pump #11 and Containment Spray Pump 'A' are out of service for maintenance. The crew is directed to start FWBP #13 and secure FWBP #11 to allow maintenance on the last FWBP motor.

**Event 1:** The crew will start FWBP #13 and secure FWBP #11 in accordance with POP02-FW-0001, Main Feedwater. This is a normal evolution with no malfunctions.

**Event 2:** After FWBP #11 is secured, ECW Pump 'A' trips and the standby train does not automatically start. The crew will use the annunciator response and normal operating procedures to place the standby train in service and properly remove the tripped train from service. The SRO will address Tech Spec implications.

**Event 3:** After ECW Tech Specs have been addressed, the controlling level channel on SG 'C' will fail low. The crew will perform the actions of POP04-FW-0001, Loss of Steam Generator Level Control, to stabilize the plant and place an alternate channel in service. The SRO will address Tech Spec implications.

**Event 4:** After Tech Specs have been addressed for the SG level channel failure, the Iso-phase cooling trouble alarm will be received. Use of the annunciator response and investigation by the local operator will reveal failure of both fans requiring a fast load reduction in accordance with POP04-TM-0005, Fast Load Reduction.

**Event 5:** After the crew has stabilized the plant following the fast load reduction, a sheared shaft on RCP 'B' will occur causing an automatic reactor trip. The crew will respond using POP05-EO-EO00, Reactor Trip or Safety Injection and transition to POP05-EO-ES01, Reactor Trip Response.

**Event 6:** Following the reactor trip, the operators will notice 2 rods stuck partially out of the core. The determination will be made that the reactor is tripped in E0, however, ES01 will require initiation of emergency boration to account for the loss of negative reactivity.

**Event 7:** 3 minutes after the emergency borate valve is opened, a loss of offsite power will occur that results in a Loss of All AC Power and requiring entry into POP05-EO-EC00, Loss of All AC Power. EC00 has instructions for energizing one 4KV ESF bus from the Emergency Transformer which will be successful.

**Termination:** The scenario will be terminated after the crew energizes a 4KV bus from the emergency transformer in EC00.

**Critical tasks:**

- Manually control SG 'C' level such that a manual or auto reactor trip does not occur.
- Following the reactor trip, initiate emergency boration prior to exiting ES01.
- Energize a 4KV ESF bus from the Emergency Transformer prior to exiting EC00.

Source: New