Printed: 04/25/2007

### Facility: South Texas Project

				RO	K/A	A Ca	ateg		SRO-Only Points									
Tier	Group	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total		A2		G*	Total
1.	1	3	3	3				3	3			3	18		0		0	0
Emergency &	2	1	2	2		N/A		2	2	N	/A	0	9		0		0	0
Abnormal Plant Evolutions	Tier Totals	4	5	5				5	5			3	27		0		0	0
2	1	3	2	3	3	3	2	2	3	2	3	2	28		0		0	0
Plant	2	1	1	1	1	1	1	1	1	1	0	1	10		0	0	0	0
Systems	Tier Totals	4	3	4	4	4	3	3	4	3	3	3	38			0	0	0
3. Gene	ric Knov	vledg	ledge And						3	3 4		1	40	1	2	3	4	
Abili	ties Cat	egori	es			3	2	2	2	2		3	10	0	0	0	0	U

Date Of Exam: 11/02/2007

Note:

 Ensure that at least two topics from every 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.
- 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 that are not included on the outline should be added. Refer to ES-401, Attachment 2, 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.
- 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.
- 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.

Facility: South Texas Project

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Printed: 04/25/2007

Form ES-401-2

E/APE # / Name / Safety Function	К1	К2	К3	A1	A2	G	КА Торіс	Imp.	Points
000007 Reactor Trip - Stabilization - Recovery / 1		X					EK2.02 - Breakers, relays and disconnects	2.6	1
000008 Pressurizer Vapor Space Accident / 3						Х	2.4.24 - Knowledge of loss of cooling water procedures.	3.3	1
000009 Small Break LOCA / 3	Х						EK1.02 - Use of steam tables	3.5	1
000011 Large Break LOCA / 3			X				EK3.14 - RCP tripping requirement	4.1	1
000015/000017 RCP Malfunctions / 4					x		AA2.09 - When to secure RCPs on high stator temperatures	3.4	1
000022 Loss of Rx Coolant Makeup / 2				x			AA1.06 - CVCS charging pump ammeters and running indicators	2.9	1
000025 Loss of RHR System / 4					X		AA2.01 - Proper amperage of running LPI/decay heat removal/RHR pump(s)	2.7	1
000026 Loss of Component Cooling Water / 8						X	2.4.10 - Knowledge of annunciator response procedures.	3.0	1
000027 Pressurizer Pressure Control System Malfunction / 3		X					AK2.03 - Controllers and positioners	2.6	1
000029 ATWS / 1					x		EA2.07 - Reactor trip breaker indicating lights	4.2	1
000038 Steam Gen. Tube Rupture / 3	X						EK1.04 - Reflux boiling	3.1*	1
000040 Steam Line Rupture - Excessive Heat Transfer / 4		X					AK2.01 - Valves	2.6*	1
000054 Loss of Main Feedwater / 4			х				AK3.02 - Matching of feedwater and steam flows	3.4*	1
000055 Station Blackout / 6						х	2.4.48 - Ability to interpret control room indications to verify the status and operation of system, and understand how operator actions and directives affect plant and system conditions.	3.5	1
000058 Loss of DC Power / 6			Х				AK3.01 - Use of dc control power by ED/Gs	3.4*	1
000062 Loss of Nuclear Svc Water / 4				X			AA1.06 - Control of flow rates to components cooled by the SWS	2.9	1
000065 Loss of Instrument Air / 8				X			AA1.02 - Components served by instrument air to minimize drain on system	2.6	1
W/E04 LOCA Outside Containment / 3	X						EK1.2 - Normal, abnormal and emergency operating procedures associated with LOCA Outside Containment	3.5	1
K/A Category Totals:	3	3	3	3	3	3	Group Point	t Total:	18

# Facility: South Texas Project

ES - 401

# **PWR RO Examination Outline**

Printed: 04/25/2007

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Form ES-401-2

E/APE # / Name / Safety Function	К1	K2	К3	A1	A2	G	KA TopicImp.AK1.05 - Calculation of minimum3.3			
000005 Inoperable/Stuck Control Rod / 1	X						AK1.05 - Calculation of minimum shutdown margin	3.3	1	
000051 Loss of Condenser Vacuum / 4					Х		AA2.02 - Conditions requiring reactor and/or turbine trip	3.9	1	
000059 Accidental Liquid RadWaste Rel. / 9				x			AA1.01 - Radioactive-liquid monitor	3.5	1	
000068 Control Room Evac. / 8					X		AA2.11 - Indications of natural circulation	4.3	1	
000076 High Reactor Coolant Activity / 9			Х				AK3.06 - Actions contained in EOP for high reactor coolant activity	3.2	1	
W/E03 LOCA Cooldown - Depress. / 4		x					EK2.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.6	1	
W/E06 Inad. Core Cooling / 4		х					EK2.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.6	1	
W/E08 RCS Overcooling - PTS / 4			Х				EK3.2 - Normal, abnormal and emergency operating procedures associated with Pressurized Thermal Shock	3.6	1	
W/E13 Steam Generator Over-pressure / 4				X			EA1.3 - Desired operating results during abnormal and emergency situations	3.1	1	
K/A Category Totals:	tals: 1 2			2	2	0	Group Poin	t Total:	9	

## Facility: South Texas Project

ES - 401			P	ant S	Syste	ms - '	Tier	2 / G	roup	1			Form E	S-401-2
Sys/Evol # / Name	кі	К2	КЗ	K4	К5	K6	A1	A2	A3	A4	G	КА Торіс	Imp.	Points
003 Reactor Coolant Pump							X					A1.07 - RCS temperature and pressure	3.4*	1
004 Chemical and Volume Control						X						K6.27 - Purpose of RHR relief and isolation valves	3.4	1
004 Chemical and Volume Control								X				A2.11 - Loss of IAS	3.6	1
005 Residual Heat Removal	X										1	K1.08 - SWS	2.7	1
006 Emergency Core Cooling	X											K1.13 - CSS	3.3*	1
006 Emergency Core Cooling					x							K5.04 - Brittle fracture, including causes and preventative actions	2.9	1
007 Pressurizer Relief/Quench Tank								x				A2.05 - Exceeding PRT high-pressure limits	3.2	1
007 Pressurizer Relief/Quench Tank										x		A4.01 - PRT spray supply valve	2.7*	1
008 Component Cooling Water				X								K4.02 - Operation of the surge tank, including the associated valves and controls	2.9	1
008 Component Cooling Water										х		A4.08 - CCW pump control switch	3.1*	1
010 Pressurizer Pressure Control								X				A2.02 - Spray valve failures	3.9	1
012 Reactor Protection			Χ									K3.01 - CRDS	3.9	1
013 Engineered Safety Features Actuation		X										K2.01 - ESFAS/safeguards equipment control	3.6*	1
022 Containment Cooling							X					A1.02 - Containment pressure	3.6	1
026 Containment Spray			Χ									K3.01 - CCS	3.9	1
039 Main and Reheat Steam					X							K5.05 - Bases for RCS cooldown limits	2.7	1
059 Main Feedwater				x								K4.19 - Automatic feedwater isolation of MFW	3.2	1
061 Auxiliary/Emergency Feedwater		х										K2.01 - AFW system MOVs	3.2*	1
062 AC Electrical Distribution											X	2.1.20 - Ability to execute procedure steps.	4.3	1
063 DC Electrical Distribution	X											K1.02 - AC electrical system	2.7	1
064 Emergency Diesel Generator						X						K6.08 - Fuel oil storage tanks	3.2	1
064 Emergency Diesel Generator										Х		A4.01 - Local and remote operation of the ED/G	4.0	1
073 Process Radiation Monitoring					x							K5.03 - Relationship between radiation intensity and exposure limits	2.9*	1
076 Service Water											X	2.1.30 - Ability to locate and operate components,	3.9	1

Facility: South Texas Project

Printed: 04/25/2007

ES - 401			P	lant S	Syste	ms - '	Tier	2 / G	roup	1			Form E	S-401-2
Sys/Evol # / Name	K1	К2	КЗ	K4	К5	K6	A1	A2	A3	A4	G	KA Topic including local controls.	Imp.	Points
076 Service Water				X								K4.06 - Service water train separation	2.8	1
078 Instrument Air									X			A3.01 - Air pressure	3.1	1
103 Containment									X			A3.01 - Containment isolation	3.9	1
103 Containment			X									K3.03 - Loss of containment integrity under refueling operations	3.7	1
K/A Category Totals:	3	2	3	3	3	2	2	3	2	3	2	Group Point	Total:	28

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### Facility: South Texas Project

ES - 401		,	P	ant S	yste	ms - '	Tier	2 / G	roup	2			Form E	S-401-2
Sys/Evol # / Name	К1	К2	K3	K4	K5	K6	A1	A2	A3	A4	G	КА Торіс	Imp.	Points
001 Control Rod Drive								X				A2.06 - Effects of transient xenon on reactivity	3.4	1
011 Pressurizer Level Control						x						K6.04 - Operation of PZR level controllers	3.1	1
015 Nuclear Instrumentation									x			A3.03 - Verification of proper functioning/operability	3.9	1
017 In-core Temperature Monitor					x							K5.02 - Saturation and subcooling of water	3.7	1
028 Hydrogen Recombiner and Purge Control		x										K2.01 - Hydrogen recombiners	2.5*	1
033 Spent Fuel Pool Cooling											X	2.4.10 - Knowledge of annunciator response procedures.	3.0	1
035 Steam Generator							Х					A1.02 - S/G pressure	3.5	1
045 Main Turbine Generator			Х									K3.01 - Remainder of the plant	2.9	1
068 Liquid Radwaste	X											K1.02 - Waste gas vent header	2.5	1
079 Station Air				x								K4.01 - Cross-connect with IAS	2.9	1
K/A Category Totals:	1	1	1	1	1	1	1	1	1	0	1	Group Point	Total:	10

# Generic Knowledge and Abilities Outline (Tier 3)

## **PWR RO Examination Outline**

Facility: South Texas Project

Printed: 04/25/2007

Form ES-401-3

Generic Category	<u>KA</u>	KA Topic	<u>Imp.</u>	<u>Points</u>
Conduct of Operations	2.1.3	Knowledge of shift turnover practices.	3.0	1
	2.1.11	Knowledge of less than one hour technical specification action statements for systems.	3.0	1
	2.1.14	Knowledge of system status criteria which require the notification of plant personnel.	2.5	1
		Category Total:		3
Equipment Control	2.2.4	(multi-unit) Ability to explain the variations in control board layouts, systems, instrumentation and procedural actions between units at a facility.	2.8	1
	2.2.13	Knowledge of tagging and clearance procedures.	3.6	1
		Category Total:		2
Radiation Control	2.3.1	Knowledge of 10 CFR: 20 and related facility radiation control requirements.	2.6	1
	2.3.2	Knowledge of facility ALARA program.	2.5	1
		Category Total:		2
Emergency Procedures/Plan	2.4.18	Knowledge of the specific bases for EOPs.	2.7	1
	2.4.25	Knowledge of fire protection procedures.	2.9	1
	2.4.35	Knowledge of local auxiliary operator tasks during emergency operations including system geography and system implications.	3.3	1
		Category Total:		3

Generic Total:

10

Form ES-401-2

1

Printed: 04/25/2007

#### Facility: South Texas Project

				RO	K/A	A Ca	ateg	ory	Po	nts					SR	D-Or	nly Pc	oints
Tier	Group	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total		A2		G*	Total
1.	1	0	0	0				0	0			0	0		4		2	6
Emergency &	2	0	0	0		N/A		0	0	N	/A	0	0		3		1	4
Abnormal Plant Evolutions	Tier Totals	0	0	0				0	0			0	0		7		3	10
2	1	0	0	0	0	0	0	0	0	0	0	0	0		3		2	5
Plant	2	0	0	0	0	0	0	0	0	0	0	0	0		0	3*	0	3
Systems	Tier Totals	0	0	0	0	0	0	0	0	0	0	0	0			6	2	8
3. Gene	ric Knov	vledg	je An	d	1	I	2	2	3	3	4	ł	_	1	2	3	4	-
Abili	ties Cat	egori	es		(	0	(	0	(	)	(	0	U	2	2	1	2	(

Date Of Exam: 11/02/2007

Note:

 Ensure that at least two topics from every 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.
- 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 that are not included on the outline should be added. Refer to ES-401, Attachment 2, 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.
- 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.
- 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.

### Facility: South Texas Project

ES - 401

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

Printed: 04/25/2007

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E/APE # / Name / Safety Function	КІ	K2	К3	A1	A2	G	КА Торіс	Imp.	Points
000025 Loss of RHR System / 4					х		AA2.02 - Leakage of reactor coolant from RHR into closed cooling water system or into reactor building atmosphere	3.8	1
000027 Pressurizer Pressure Control System Malfunction / 3						х	2.4.47 - Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	3.7	1
000038 Steam Gen. Tube Rupture / 3					x		EA2.05 - Causes and consequences of shrink and swell in S/Gs	2.9	1
000054 Loss of Main Feedwater / 4					х		AA2.07 - Reactor trip first-out panel indicator	3.9	1
000065 Loss of Instrument Air / 8						x	2.4.48 - Ability to interpret control room indications to verify the status and operation of system, and understand how operator actions and directives affect plant and system conditions.	3.8	1
W/E12 - Steam Line Rupture - Excessive Heat Transfer / 4					x		EA2.1 - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	4.0	1
K/A Category Totals:	0	0	0	0	4	2	Group Poin	t Total:	6

Facility: South Texas Project

ES - 401

Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Printed: 04/25/2007

Form	ES-401	-2
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E/APE # / Name / Safety Function	К1	К2	K3	A1	A2	G	КА Торіс	Imp.	Points
000001 Continuous Rod Withdrawal / 1					X		AA2.03 - Proper actions to be taken if automatic safety functions have not taken place	4.8	1
000033 Loss of Intermediate Range NI / 7						Х	2.2.23 - Ability to track limiting conditions for operations.	3.8	1
000068 Control Room Evac. / 8					X		AA2.03 - T-hot, T-cold, and in-core temperatures	4.2	1
W/E03 LOCA Cooldown - Depress. / 4					Х		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	4.1	1
K/A Category Totals:	0	0	0	0	3	1	Group Poin	4	

# Facility: South Texas Project

Printed:	04/25/2007
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ES - 401	Plant Systems - Tier 2 / Group 1							Form E	S-401-2					
Sys/Evol # / Name	K1	К2	К3	K4	К5	K6	A1	A2	A3	A4	G	КА Торіс	Imp.	Points
005 Residual Heat Removal											X	2.4.11 - Knowledge of abnormal condition procedures.	3.6	1
010 Pressurizer Pressure Control								X				A2.01 - Heater failures	3.6	1
061 Auxiliary/Emergency Feedwater								X				A2.04 - pump failure or improper operation	3.8	1
076 Service Water								X				A2.01 - Loss of SWS	3.7*	1
103 Containment											X	2.4.4 - Ability to recognize 4.3 abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.		1
K/A Category Totals:	0	0	0	0	0	0	0	3	0	0	2	Group Point	Total:	5

Facility: South Texas Project

Printed: 04/25/2007

ES - 401	- 401 Plant Systems - Tier 2 / Group 2							Form ES-401-2						
Sys/Evol # / Name	K1	К2	К3	K4	К5	K6	A1	A2	A3	A4	G	КА Торіс	Imp.	Points
014 Rod Position Indication								X			[	A2.04 - Misaligned rod	3.9	1
017 In-core Temperature Monitor								X				A2.02 - Core damage	4.1	1
041 Steam Dump/Turbine Bypass Control								X				A2.03 - Loss of IAS	3.1	1
K/A Category Totals:	0	0	0	0	0	0	0	3	0	0	0	Group Poin	t Total:	3

# Generic Knowledge and Abilities Outline (Tier 3)

## **PWR SRO Examination Outline**

**Facility:** South Texas Project

Printed: 04/25/2007

Form ES-401-3

Generic Category	<u>KA</u>	KA Topic	<u>Imp.</u>	<u>Points</u>
Conduct of Operations	2.1.4	Knowledge of shift staffing requirements.	3.4	1
	2.1.12	Ability to apply technical specifications for a system.	4.0	1
		Category Total:	·····	2
Equipment Control	2.2.6	Knowledge of the process for making changes in procedures as described in the safety analysis report.	3.3	1
	2.2.27	Knowledge of the refueling process.	3.5	1
		Category Total:		2
Radiation Control	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	3.3	1
		Category Total:		1
Emergency Procedures/Plan	2.4.4	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.3	1
	2.4.44	Knowledge of emergency plan protective action recommendations.	4.0	1
		Category Total:		2

Generic Total:

1

7

ES-401	R	ecord of Rejected K/As Form ES-401-4
Tier/	Randomly Selected	Reason For Rejection
Group	<u>K/A</u>	
RO		
1/1	APE 026 AK3.01	STP does not have automatic valves for this function
1/1	EPE W/E04 EK1.1	Unable to formulate a question representative of RO level
1/1	EPE W/E05 2.4.46	Unable to formulate a question representative of RO level
1/2	APE 003 AK3.03	STP does not have an auto turbine runback
1/2	EPE W/E09 EK3.2	Oversampling of natural circulation topic
1/2	APE 067 AK1.02	Unable to formulate a question representative of RO level
2/1	022 K4.02	STP does not have variable speed fans
2/1	022 K4.01	STP does not use penetration cooling
2/2	041 K2.02	STP does not have an Integrated Control System
SRO		
1/1	APE 008 AA2.09	STP does not have PZR spray block valves
1/2	EPE W/E09 EA2.2	Oversampling of natural circulation topic
1/2	APE 032 AA2.07	Unable to formulate SRO level question
3	2.3.2	Unable to formulate SRO level question - non specific SRO duties/responsibilities

ES-301

# Administrative Topics Outline

Form ES-301-1

Facility: <u>South Te</u>	<u>xas Project</u>	Date of Examination: 11/5/2007			
Examination Level (circle	e one): RC	SRO Operating Test Number: 1 (NRC)			
Administrative Topic (see Note)	Type Code*	Describe activity to be performed:			
(A1) Conduct of Operations	D, R	VERIFY FAULTED RCS INVENTORY K/A 2.1.18 (2.9) Ability to make accurate, clear and concise logs, records, status boards, and reports			
(A2) Conduct of Operations	N, R	DETERMINE DILUTION REQUIRED FOR POWER INCREASE K/A 2.1.7 (3.7) Ability to evaluate plant performance and make operational judgements based on operating characteristics, reactor behavior, and instrument interpretation			
(A3) Equipment Control	D, R	WRITE ECO FOR A CL-ACW PUMP K/A 2.2.13 (3.6) Knowledge of tagging and clearance procedures			
(A4) Radiation Control	N, R	CALCULATE MAXIMUM STAY TIME K/A 2.3.1 (2.6) Knowledge of 10CFR20 and related facility radiation control requirements			
Emergency Plan	NA	NA			
NOTE: All items (5 total) they are retaking only th	are require e administr	d for SROs. RO applicants require only 4 items unless rative 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	Admini	strative Topics Outline Form ES-301-1			
Facility: <u>South Te</u>	<u>xas Project</u>	Date of Examination: 11/5/2007			
Examination Level (circle	e one): RO	SRO Operating Test Number: 1 (NRC)			
Administrative Topic (see Note)	Type Code*	Describe activity to be performed:			
(A5) Conduct of		DETERMINE TS ACTION FOR ABNORMAL RCS ACTIVITY			
Operations	D, R	K/A 2.1.12 (4.0) Ability to apply technical specifications for a system			
(A6) Conduct of		REVIEW OPERATOR LOGS			
Operations	D, R	K/A 2.1.3 (3.4) Knowledge of shift turnover practices			
		REVIEW A FAULTED ECO (RHR PUMP)			
(A7) Equipment Control	D, R	K/A 2.2.13 (3.8) Knowledge of tagging and clearance procedures			
		CALCULATE MAXIMUM STAY TIME			
(A4) Radiation Control	N, R	K/A 2.3.1 (3.0) Knowledge of 10CFR20 and related facility radiation control requirements			
		DETERMINE EMERGENCY CLASSIFICATION			
(A8) Emergency Plan	N, R	K/A 2.4.41 (4.1) Knowledge of the emergency action level thresholds and classifications			
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 Control Room/In-Plant Systems Outline Form ES-301-2				
Facility: South Texas Project	Date of	Examination:	11/05/2007	
Exam Level (circle one): <u>RO</u> / SRO(I)) SRO(U)	Operati	ng Test No.:	1 (LOT 16 NRC)	
Control Room Systems <sup>@</sup> (8 for RO; 7 for SROI; 2 or	3 for SROU, ir	ncluding 1 ES	F)	
System / JPM Title		Type Code*	Safety Function	
a. (S1) RESPOND TO CCW LEAK (LEAK OCCURS V SHIFTING PUMPS)	VHILE	S,A,N	VIII	
b. (S2) TRANSFER MFW CONTROL TO MFW REG.	VALVES	S,D	IV - S	
c. (S3) RESTORE OFFSITE POWER TO ESF BUSES	•	S,D	VI	
d. (S4) RE-ESTABLISH RCP SEAL INJECTION		S,A,M	11	
e. (S5) REACTOR MAKEUP SYSTEM FAILURE		S,A,M	I	
f. (S6) RESPOND TO A CONTAINMENT RAD MONIT (RT-8012) (ESF SYSTEM)	OR ALARM	S,A,D	VII	
g. (C1) TRANSFER TO HOT LEG RECIRC		C,L,D		
h. (C2) PLACE H $_2$ RECOMBINER IN SERVICE (RO O	NLY)	C,L,D	v	
In-Plant Systems <sup>@</sup> (3 for RO; 3 for SROI; 3 or 2 for S	SROU)		••••••••••••••••••••••••••••••••••••••	
i. (P1) LOCALLY VERIFY CONTAINMENT ISOLATIO	N PHASE B	R,D,L,E	v	
j. (P2) PLACE 1E BATTERY CHARGER IN SERVICE		A,D	VI	
k. (P3) LOCALLY OPERATE SG PORV		D,L,E	IV - S	
@ All RO and SRO-I control room (and in-plant) systems functions; all 5 SROU systems must serve different safe overlap those tested in the control room.	s must be differe ty functions; in-	ent and serve d plant systems	ifferent safety and functions may	
*Type Codes	Cri	teria for RO/S	RO-I/SRO-U	
<ul> <li>(A)Iternate Path</li> <li>(C)ontrol Room</li> <li>(D)irect from Bank</li> <li>(E)mergency or abnormal in-plant</li> <li>(L)ow-Power / Shutdown</li> <li>(N)ew or (M)odified from bank including 1(A)</li> <li>(P)revious 2 exams</li> </ul>	4-6 / 4-6 / 2-3 $\leq 9 / \leq 8 / \leq 4$ $\geq 1 / \geq 1 / \geq 1$ $\geq 1 / \geq 1 / \geq 1$ $\geq 2 / \geq 2 / \geq 1$ $\leq 3 / \leq 3 / \leq 2$	(randomly sele	cted)	
(R)CA (S)imulator	≥1/≥1/≥1			

NOTE: The following simulator JPMs are designed to be done concurrent: S1&S2; S3&S4; S5&S6

ES-301

Control Room/In-Plant Systems Outline Form ES-301-2

Facility: South Texas Project	Date of	Examination:	11/05/2007					
Exam Level (circle one): RO / SRO(I) (SRO(U)	Operati	ng Test No.:	1 (LOT 16 NRC)					
Control Room Systems <sup>@</sup> (8 for RO; 7 for SROI; 2 or 3	Control Room Systems <sup>@</sup> (8 for RO; 7 for SROI; 2 or 3 for SROU, including 1 ESF)							
System / JPM Title		Type Code*	Safety Function					
a. (S5) REACTOR MAKEUP SYSTEM FAILURE		S,A,M	I					
b. (S6) RESPOND TO A CONTAINMENT RAD MONIT (RT-8012) (ESF SYSTEM)	OR ALARM	S,A,D	VII					
In-Plant Systems <sup>@</sup> (3 for RO; 3 for SROI; 3 or 2 for SROU)								
i. (P1) LOCALLY VERIFY CONTAINMENT ISOLATION	I PHASE B	R,D,L,E	v					
j. (P2) PLACE 1E BATTERY CHARGER IN SERVICE		A,D	VI					
k. (P3) LOCALLY OPERATE SG PORV		D,L,E	IV - S					
@ 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	Cri	teria for RO/SI	RO-I/SRO-U					
(A)Iternate Path (C)ontrol Room	4-6 / 4-6 / 2-3							
(D)irect from Bank	8 / ≤ 4							
(E)mergency or abnormal in-plant	21/21/21	/ 21/21						
(N)ew or (M)odified from bank including 1(A)	21/21/21							
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$	(randomly seled	cted)					
(R)CA (S)imulator	≥1/≥1/≥1		-					

NOTE: The following simulator JPMs are designed to be done concurrent: S5&S6

Facility: STP

### NRC Exam Scenario No.: 1

**Op-Test No.: 1** 

Source:

New X Bank - Significantly Modified Bank - Initial Condition Change

See page 3 for Examiner/student assignments

Initial Conditions: 30% power, BOL, RCS boron at 1665 ppmB.

Turnover: Performing a plant startup following a maintenance outage. Maintain current power until CWP #14 has been started. AFW #11 OOS for maintenance.

Malf. No.	Event Type*	Event Description
NA	BOP (N) SRO (N)	Start Circulating Water Pump (CWP) #14
02-20-01 (1.0)	RO (I) SRO (I)	PZR level controlling channel LT-465 fails high - after #14 CWP started – integral to scenario (actuated from Green light on #14 CWP discharge valve going out indicating the valve is full open).
05-22-01 (0)	BOP (I) SRO (I)	1A Steam Generator controlling pressure channel (PT-0514) fails low – after TS consulted for Pzr level channel failure or 12 minutes
05-03-02 (0.1)	ALL (M)	1B Steam Generator Tube Leak/Rupture (5 min. ramp) – after TS consulted for Steam Pressure Channel failure or after 14 minutes
01-12-02 (True)	RO (C) BOP (C) SRO (C)	ATWS (failure of auto and manual reactor trip) becomes apparent when Reactor trip required on SGTR.
05-16-01 (True)	BOP (C) SRO (C)	Steam Dump Valves fail to open during cooldown for SGTR - integral to scenario, will occur when Steam Pressure mode is selected
01-35-02 (True)	RO (C) SRO (C)	Intermediate Range Channel N36 failure of compensating voltage - integral to scenario, will be apparent approx. 15 minutes after reactor trip
	Malf. No. NA 02-20-01 (1.0) 05-22-01 (0) 05-03-02 (0.1) 01-12-02 (True) 05-16-01 (True) 01-35-02 (True)	Malf. No.         Event Type*           NA         BOP (N) SRO (N)           02-20-01 (1.0)         RO (I) SRO (I)           05-22-01 (0)         BOP (I) SRO (I)           05-03-02 (0.1)         ALL (M)           01-12-02 (True)         RO (C) BOP (C) SRO (C)           05-16-01 (True)         BOP (C) SRO (C)           01-35-02 (True)         RO (C) SRO (C)

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

### **NRC Scenario 1 Description**

The plant is initially at 30% power. After the crew takes the watch they will start a Circulating Water Pump. Shortly after this normal evolution is completed, a Pressurizer level channel fails high requiring the crew to take manual control of Pressurizer Level Control to re-establish inventory control in the RCS. Once the Pressurizer level channel failure is mitigated, a SG pressure channel on SG 1A fails low. This will result in a loss of automatic level control on 1A SG requiring manual operator action to prevent a plant trip. Once the 1A SG level control is returned to automatic, a SGTR will occur in 1B SG. The crew will initially address the malfunction as a leak, but will reach a point that a reactor trip and safety injection will be necessary. The reactor will fail to trip automatically or manually. The crew will enter the ATWS procedure to effect a reactor trip/shutdown. Later, while performing actions in the Emergency Operating procedures, Intermediate Range Channel N36 will have a compensating voltage failure that will prevent the Source Ranges from energizing automatically following the reactor trip. The operator will have to manually energize the Source Ranges. During the cooldown following the SGTR, a failure of the Steam Dumps will occur that requires the crew to use the SG PORV's for cooldown. The scenario will be terminated once the target cooldown temperature is reached and RCS depressurization is completed.

### The EOP procedures invoked will include:

- 0POP05-EO-EO00, Reactor Trip or Safety Injection
- 0POP05-EO-FRS1, Response to Nuclear Power Generation ATWS
- 0POP05-EO-EO30, SGTR

### Critical Tasks:

- 1. Manually control SG level such that a manual or automatic reactor trip is not necessary.
- 2. Properly select and maintain target temperature for cooldown based on the chart provided in EO30.

### Scenario Source: New

Facility: STP

### NRC Exam Scenario No.: 2

Source:

New X Bank - Significantly Modified Bank - Initial Condition Change

See page 3 for Examiner/student assignments

Initial Conditions: 60% power, ready to raise power following repair of shift of Condensate Pumps. SUFP is OOS for motor refurbishing. 'C' Train Containment Spray and RCFC's are OOS for scheduled maintenance.

Turnover: 60% power. Continue power ascension (POP03-ZG-0005, step 7.35.7). BOL, 1548 ppmB

Event No.	Malf. No.	Event Type*	Event Description					
1 (1 min)	NA	BOP (N) SRO (N)	Shift Condensate Pumps					
2 (11 min)	10-11-02 (True)	RO (C) BOP (C) SRO (C)	Loss of 4160v Bus E1B – integral to scenario (actuated from Green light coming on for Cond. Pump # 12 indicating the pump is secured + 1 min. time delay)					
3 (26 min)	08-23-02 (True) 08-23-03 (True)	BOP (C) SRO (C)	Loss of Condensate Pump 13 and Standby pump (12) trips 45 sec. after start – occurs after TS have been consulted for loss of 4160v Bus or after 15 minutes.					
4 (31 min)	NA	RO (R) BOP (R) SRO (R)	Power reduction due to loss of condensate flow – begins approx. 5 minutes after loss of Condensate Pump					
5 (41 min)	01-07-07 (True)	RO (C) SRO (C)	Dropped control rod during power reduction – after some amount of power reduction or 10 minutes after power reduction started.					
6 (46 min)	05-02-04 (0.1/0.5)	All (M)	Steam Break on SG 1D inside Containment (ramped over 1 min. then gets larger after 4 min.) – integral to scenario (actuated 5 min. after rod drop)					
7 (NA)	04-09-07 (True)	BOP (C) SRO (C)	'A' Essential Chiller Trips (occurs when 'A' HHSI starts following SI)					
* (N)ormal,	(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor							

### **NRC Scenario 2 Description**

The plant is initially at 60% power with power escalation on hold until Condensate Pumps are shifted which will be the first activity the crew performs once they take the watch. Following this normal evolution, a loss of power to ESF 4160V Bus E1B will occur. In addition to the equipment actions that the crew will perform, they must also recognize the equipment loss represents an entry into Tech Spec 3.0.3 because a different train of equipment was out of service at the beginning of the scenario. Once the bus failure has been addressed and Tech Specs consulted, Condensate Pump 13 will trip followed by a trip of the standby Condensate Pump 45 seconds after it is started. This will require the crew to reduce turbine load to maintain Deaerator level, otherwise a manual reactor trip will be necessary. During the power reduction a control rod will drop into the core. The crew will have to place control rods in manual and use boric acid to accommodate any further power reduction. After power is reduced, a steam break then occurs on SG 1D inside containment. Following the SI condition, Essential Chiller 'A' will fail to start automatically or manually and will require manual compensatory actions for the associated HVAC. The scenario will terminate once the crew checks for conditions to terminate Safety Injection in 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant.

The EOP procedures invoked will include:

- 0POP05-EO-EO00, Reactor Trip or Safety Injection
- 0POP05-EO-FRZ1, Response to High Containment Pressure
- 0POP05-EO-EO20, Faulted SG Isolation
- 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant

### Critical Tasks:

- Manually reduce plant power such that a manual or automatic reactor trip is not necessary.
- Isolate the faulted SG before transition out of EO20.

### Scenario Source: New

Facility: STP	NRC Exam Scenario No.: Backup	Op-Test No.: 1
Source:		

New X Bank - Significantly Modified Bank - Initial Condition Change

See page 3 for Examiner/student assignments

Initial Conditions: 73% power at BOL, 1469 ppmB. Power reduction in progress for turbine blade inspection. FWBP # 11 and "C" Train HHSI, LHSI, CCW Pumps OOS for motor maintenance.

Turnover: 73% power, shutdown in progress. Currently at step 5.12 of 0POP03-ZG-0006.

Event No.	Malf. No.	Event Type*	Event Description
1 (1 min)	NA	RO (R) BOP (R) SRO (R)	Power Reduction
2 (6 min)	03-17-02 (True)	RO (C) SRO (C)	Boric Acid Pump 'B' trips during first boration of the power reduction – (within approximately 5 minutes of starting power reduction) – integral to scenario.
3 (~15 min)	10-09-03 (True)	RO (C) BOP (C) SRO (C)	Loss of Standby Bus H – after TRM consulted for BA Pump failure and cue from examiner for load reduction.
4 (30 min)	05-17-01 (1.0)	BOP (I) SRO (I)	1A SG PORV Pressure Transmitter PT-7411 fails high – after crew transitions to 0POP04-AE-0003, or after 15 min.
5 (40 min)	03-23-05 (0.129/0.4)	RO (C) SRO (C)	RCP 1C #1 seal leakage ramped in over 3 min. then increased in severity after 7 min – after T.S. addressed for SG PORV Transmitter or after 10 minutes
6 (58 Min)	02-01-01 (0.0009)	All (M)	SBLOCA – occurs at step 6 of ES01
7 (NA)	Remote L2- 60 (True)	BOP (C) SRO (C) RO (C)	Failure of ESF DG # 13 to load - integral to scenario, will occur following SBLOCA on re-sequence

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

### **NRC Backup Scenario Description**

The plant is initially at 73% power with a shutdown in progress to allow for turbine blade inspections. A normal evolution of a power reduction will begin, but Boric Acid Pump 1B will trip during the first boration. The RO will have to use an alternate pump and perform checks on the Reactor Makeup Water System to ensure its operability for use. Once this is done, 13.8 kV Standby Bus 1H will develop an electrical fault and deenergize. This will cause a loss of power to 4160v ESF bus E1C resulting in the associated ESF Diesel Generator starting and loading onto the bus. Once the crew verifies that necessary equipment has loaded and the plant is stable, the steam pressure transmitter on SG 1A controlling the 'A' SG PORV fails. This will cause the SG 'A' PORV to open resulting in a plant transient. The PORV can be manually closed. Once the 1A SG PORV is closed and TS have been consulted, a seal leak develops on RCP 'C' #1 seal. This leak will grow to the point of requiring a manual reactor trip. Once the crew leaves the EOP entry procedure, a Small Break LOCA (SBLOCA) will occur. This will result in a Safety Injection however, #13 ESF DG will fail to automatically load requiring the crew to manually load equipment, some of which is very important to plant and/or equipment operation (e.g. ECW pump for ESF DG cooling, HHSI pump otherwise only one will be in service). The scenario is terminated once the crew transitions to 0POP05-EO-ES12, Post LOCA Cooldown and Depressurization.

### The EOP procedures invoked will include:

- 0POP05-EO-EO00, Reactor Trip or Safety Injection
- 0POP05-EO-ES01, Reactor Trip Response
- 0POP05-EO-EO10, Loss of Reactor of Secondary Coolant.

### Critical Tasks:

- De-pressurizing SG's to less than or equal to 1000 psig within 45 minutes of a SBLOCA.
- With RCP trip criteria met (RCS pressure < 1430 psig) and only 1 HHSI pump in service, trip RCP's.

Scenario Source: New

ES-301		Transient and Event Checklist										Form ES-301-5							
FACILITY:	SOUTH TEXA	S PROJE	ст		DATE	OF EXAN	<b>1: 11</b> /	05/200	)7			OPER/	ATING "	TEST	10.:	1			
Α	Е	Scenarios																	
P P L I C A N T	V E N T Y P		1				3			4	~ 14	T O T A L		*)					
	E	CREW POSITION		CREW POSITION			P	CREV	N ON	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	S R O	A T C	B O P		R	1	U		
	RX	None					4							1	1	1	0		
RO	NOR	1					1			-				2	1	1	1		
SRO-I	I/C	2,3, 5,6, 7					2,3, 7							8	4	4	2		
$\smile$	MAJ	4					6							2	2	2	1		
	TS	2,3					N/A							2	0	2	2		
	RX		None		4									1	1	1	0		
RO	NOR		None		1									1	1	1	1		
SRO-I	I/C		2,5,7		2,3, 5,7									7	4	4	2		
0110-0	MAJ		4		6									2	2	2	1		
	TS		N/A		2,5									2	0	2	2		
RO	RX			None		4								1	1	1	0		
SRO-I	NOR			1		None								1	1	1	1		
	I/C			3,5,6		2,5								5	4	4	2		
SRO-U	MAJ		:	4		6								2	2	2	1		
	15			N/A	**************************************	N/A	_							0	0	2	2		
	RX		None				4							1		1	0		
SRO-I	NOR		None				1 2,3,							1	1	1	1		
SRO-U	<i>//C</i>		2,5,7				7							6	4	4	2		
	MAJ TS		4 N/A				0 N/A							2	2	2	1		
Instruction	<u> </u>						11/5								U	2	2		
(1) C as p	Circle the appli applicable for F BROs must do position.	cant leve RO applic one scen	l and ente ants. ROs ario, inclu	r the oper must ser iding at le	ating tes ve in bot ast two i	st number th the "at- instrumen	and Forn the-contr t or comp	n ES-D ols" (A ponent	-1 eve (TC) ai (I/C) r	nt num nd "bal nalfunc	bers fo ance-of tions a	r each ( -plant ( nd one	event t BOP)" major	/pe; TS positio transie	6 are n ons; In ent, in 1	ot stant :he AT(	c		
(2) R s c	Reactivity mani Significant per Component ma	pulations Section C Ifunction	s may be c C.2.a of Ap s on a 1-fo	onducted opendix D. or-1 basis	under n * React	ormal or o ivity and n	controlled ormal ev	abno olution	rmal c is may	onditio be rep	ns (refe laced v	er to Se vith add	ction D litional	.5.d) b instru	ut mus ment c	st be or			
(3) V p ti	Vhenever prac provide insight he right hand (	tical, both to the ap colums.	n instrume plicant's	ent and co competen	omponen ce coun	it malfunc t toward ti	tions sho ne minim	uld be um rec	incluc Juirem	ded; on ents sp	ly those ecified	e that re for the	equire v applic	/erifiat ant's li	ole acti cense	ons th Ievel i	at n		

ES-301

**Competencies Checklist** 

Form ES-301-6

Facility: South Texas Project Date of Examination: 11/05/2007 Operating Test No.: 1																
	APPLICANTS															
	ROH SRO-I / SRO-U				RO	SRO-U	RO	I) RO	)-1 /		RO / RO-I / SRO-U					
Competencies	SCENARIO			sc	ENAR	sc	ENAR	10		SCENARIO						
	<b>1</b> (US)	<b>2</b> (BOP)	3	4	<b>1</b> (ATC)	<b>2</b> (US)	3	4	<b>1</b> (BOP)	<b>2</b> (ATC)	3	4	<b>1</b> (ATC)	<b>2</b> (BOP)	3	4
Interpret/Diagnose Events and Conditions	2,3 4,5	2,3 6,7			2,5,7	2,3 5,6			3,4,6	2,5,6			2,5,7	2,3 6,7		
Comply With and Use Procedures (1)	ALL	1,3 4,7			2,4,5	ALL			1,3,4 5,6	2,4 5,6			2,4,5	1,3 4,7		
Operate Control Boards (2)	N/A	1,3 4,7			2,4 5,7	N/A			1,3,4 5,6	2,4 5,6			2,4 5,7	1,3 4,7		
Communicate and Interact	ALL	ALL			ALL	ALL			ALL	ALL			ALL	ALL		
Demonstrate Supervisory Ability (3)	2,3,4 5,6	N/A			N/A	2,3,4 5,6			N/A	N/A			N/A	N/A		
Comply With and Use Tech. Specs. (3)	2,3	N/A			N/A	2,5			N/A	N/A			N/A	N/A		
Notes:																

(1) Includes Technical Specification compliance for an RO.

(2) Optional for an SRO-U.

(3) Only applicable to SROs.

### Instructions:

Circle the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.