

Facility: South Texas ProjectDate of Examination: 8/18/03Examination Level: RO Operating Test Number: 1

Administrative Topic (see Note)	Describe activity to be performed:
Conduct of Operations	(A.1) Perform QPTR (Modified)  K/A 2.1.33 (3.4) Ability to recognize indications for system operating parameters which are entry level conditions for technical specifications.
Conduct of Operations	(A.2) Determine Reactor Vessel level (New)  K/A 2.1.20 (4.3) Ability to execute procedure steps
Equipment Control	(A.3) Review completed surveillance  K/A 2.2.12 (3.0) Knowledge of surveillance procedures
Radiation Control	(A4) Determine radiological requirements to enter a high radiation area  K/A 2.3.10 (3.3) Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.
Emergency Plan	NA

**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.

Facility: South Texas Project

Date of Examination:

8/18/2003Examination Level: SRO    Operating Test Number: 1

Administrative Topic (see Note)	Describe activity to be performed:
Conduct of Operations	(A5) Review RCS Inventory and determine Tech Spec applicability  K/A 2.1.7: (4.4) Ability to evaluate plant performance and make operational judgements based on operating characteristics, reactor behavior and instrument response.
Conduct of Operations	(A6) Determine Shift Staffing Requirements  K/A 2.1.5 (3.4) Ability to locate and use procedures and directives related to shift staffing
Equipment Control	(A7) Review ESF Power Availability Results (Modified)  K/A 2.1.33 (4.0) Ability to recognize indications for system operating parameters which are entry level conditions for Tech Specs.
Radiation Control	(A4) Determine radiological requirements to enter a high radiation area  K/A 2.3.10 (3.3) Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.
Emergency Plan	(A8) Declare an Emergency Action Level (Modified)  K/A 2.4.41 (4.1) Knowledge of the emergency action level thresholds and classification.
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.	

Facility: South Texas Project Date of Examination: 8/18/03

Exam Level: RO / SRO(I) Operating Test No.: 1

**Control Room Systems (8 for RO; 7 for SROI; 2 or 3 for SROU)**

System / JPM Title	Type Code*	Safety Function
a. (S1) Recover a Dropped Control Rod	S, D	I
b. (S2) Establish RCP Seals with the PDP	S, N	II
c. (S3) Manually Energize an ESF Bus	S, N, A, E	VI
d. (S4) Isolate SI Accumulators	S, A, D, L, E	III
e. (S5) Power Range NI Failure	S, D	VII
f. (S6) Establish Supplementary Purge	S, D, L	VIII
g. (C1) Determine/Establish CS Requirements	C, D, A, L, E	V
h. (C2) Respond to RCB High Radiation (RO ONLY)	C, N, L	IX (APE)

**In-Plant Systems (3 for RO; 3 for SROI; 3 or 2 for SROU)**

i. (P1) Local Check of RT-8038	P, D, R, A	IX
j. (P2) Place a Battery Charger in Service	P, D	VI
k. (P3) Restore Power to SI Accumulator Isolation Valves	P, D, A, L., E	II

\* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA, (P)lant, (E)SF

NOTE: The following are designed to be run concurrent:

S1/S3  
S2/S5  
S4/S6

Facility:       South Texas Project       Date of Examination:       8/18/03      Exam Level: SRO(U)            Operating Test No.:       1      **Control Room Systems (8 for RO; 7 for SROI; 2 or 3 for SROU)**

System / JPM Title	Type Code*	Safety Function
a. (S4) Isolate SI Accumulators	S, A, D, L, E	III
b. (S6) Establish Supplementary Purge	S, D, L	VIII

**In-Plant Systems (3 for RO; 3 for SROI; 3 or 2 for SROU)**

i. (P1) Local Check of RT-8038)	P, D, R, A	IX
j. (P2) Place a Battery Charger in Service	P, D	VI
k. (P3) Restore Power to SI Accumulator Isolation Valves	P, D, A, L, E	II

\* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA, (P)lant, (E)SF

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

S4 and S6

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**Appendix D Scenario Outline Form ES-D-1**


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**Facility: South Texas Project**
**NRC Scenario No.: 1**
**Op-Test No.: 1**
**Source:**
**New** \_\_\_\_\_ **Bank - Significantly Modified** \_\_\_\_\_ **Bank - Initial Condition Change**   X  
**Examiners:**
**SRO-**
**Operators:**
**RO-**
**BOP-**
**Initial Conditions: 100% power, BOL**
**Aux. Feedpump #11 is OOS for maintenance.**
**Turnover: Maintain current power. Shift Centrifugal Charging Pumps for upcoming maintenance.**

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	RO (N) SRO (N)	Shift Centrifugal Charging Pumps.
2	03-09-02	RO (C) SRO (C)	1B Centrifugal Charging Pump trips.
3	08-15-03	BOP (I) SRO (I)	1C Steam Generator controlling Feedwater flow channel fails low.
4	50-BM-01	RO (I) SRO (I)	VCT level transmitter LT-113 fails high.
5	05-03-02 05-02-02	ALL (M)	1B Steam Generator Tube Rupture with small steam leak inside RCB
6	05-07-02	BOP (C) SRO (C)	Steam Generator 1B Main Steam Isolation Valve fails to close. Can be closed locally.
7	01-35-02	RO (C) SRO (C)	Intermediate Range Channel N36 failure of compensating voltage

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

Facility: South Texas Project    NRC Scenario No.: 2    Op-Test No.: 1

**Source:**

New   X   Bank - Significantly Modified        Bank - Initial Condition Change

**Examiners:**

SRO-

**Operators:**

RO-

BOP-

Initial Conditions: 80% power at BOL, power escalation in progress following a shutdown for turbine blade inspection.

Turnover: 80% power, power escalation in progress. Currently at step 7.33 of 0POP03-ZG-0005. Boric Acid Tanks are at 7300 ppm

Event No.	Malf. No.	Event Type*	Event Description
1	05-22-01 (value: 0)	BOP (I) SRO (I)	1A SG Pressure Transmitter PT-514 fails low
2	08-23-01	BOP (C) SRO (C)	Loss of Condensate Pump 11
3	01-07-01	RO (C) SRO (C)	Dropped Control Rod
4	NA	RO (R) BOP (R) SRO (R)	Power Reduction due to dropped rod
5	50-LI-53	BOP (C) RO (C) SRO (C)	Second Dropped Control Rod (after some power reduction). Manual Reactor Trip
6	01-12-01 01-12-02	RO (C) BOP (C) SRO (C)	ATWS-reactor fails to trip automatically or manually. Can be tripped by opening LC breakers from the control room
7	02-01-01 (1.0 w/30sec ramp)	All (M)	RCS break develops into a LBLOCA (after ES01 entry)

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

Facility: South Texas Project NRC Scenario 3

Op-Test No.: 1

Source:

New        Bank - Significantly Modified   X   Bank - Initial Condition Change   X  Examiners:

SRO-

Operators:

RO-

BOP-

Initial Conditions: 60% power. Power decrease is on hold to allow a SG Feedpump to be secured.

Turnover: 60% power. Power decrease is on hold to allow a SG Feedpump to be secured. Maintain current power level.

Event No.	Malf. No.	Event Type*	Event Description
1	NA	BOP (N) SRO (N)	Secure SGFPT
2	02-26-02	RO (I) SRO (I)	Loop 'B' T-Cold TT-420B fails high
3	05-12-03	BOP (I) SRO (I)	1C Steam Generator level transmitter fails low
4	08-16-03 (value: 0)	BOP (C) SRO (C)	SG 1C Feedwater Regulating Valve (FCV-553) fails closed (after Feedwater regulating valve is returned to auto) resulting in a reactor trip
5	02-12-01	All (M)	Pzr Steam Space Break (after entry into ES01)
6	10-02-01	RO (C) SRO (C)	Loss of power to ESF Bus '1A', ESF DG #11 fails to load

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

Facility: South Texas Project      NRC Backup Scenario      Op-Test No.: 1

**Source:**

New \_\_\_\_ Bank - Significantly Modified        X   Bank - Initial Condition Change   X  

**Examiners:**

SRO-

**Operators:**

RO-

BOP-

**Initial Conditions:** 40% power, shutdown in progress for turbine blade inspection. The National Weather Service has issued a Severe Weather Warning in effect until 2000 hrs.

**Turnover:** 40% power. Plant shutdown in progress to allow turbine blade inspection. Plant shutdown is on hold to allow FW Booster Pumps to be swapped due to bearing noise on FW Booster Pump #11. The National Weather Service has issued a Severe Weather Warning in effect until 2000 hrs.

Event No.	Malf. No.	Event Type*	Event Description
1	NA	BOP (N) SRO (N)	Swap FW Booster Pumps
2	03-17-02	RO (C) SRO (C)	Boric Acid Pump 'B' trips during first boration of the power reduction.
3	05-14-01 (value: .6)	BOP (I) SRO (I)	Steam Header Pressure Instrument PT-557 fails low
4	03-06-01	BOP (C) SRO (C)	Letdown Pressure Control Valve PCV-0135 fails closed
5	05-02-04	All (M)	Steam Break on SG 1D inside Containment (ramped over 5 min.)
6	01-12-04A 01-12-04B 01-12-04C	RO (C) SRO (C)	Phase 'A' Containment Isolation fails to actuate

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



## Scenario 1 Description

The plant is initially at 100% power with Auxiliary Feedpump #11 out of service. During the scenario, this will require the operator to manually cross-connect Aux. Feedwater to feed the 1A SG. Once the crew takes the watch, the RO is directed to shift Centrifugal Charging Pumps (CCP). Once this is accomplished the operating CCP will trip resulting in a loss of seal injection and charging. Once another CCP is placed in service, the controlling feedflow channel on SG 1C fails low. This will result in a loss of automatic level control on 1C SG requiring manual operator action to prevent a plant trip. Once the 1C SG level control is returned to automatic, Volume Control Tank (VCT) level transmitter LT-113 fails high. This instrument does not provide control board indication so the operator will have to diagnose the failure through alternate indications and system response. The failure will require the operator to manually control VCT level. Once this event has been addressed, a SGTR will occur in 1B SG. When actions are taken to isolate the ruptured SG its MSIV fails to close from the Control Room (it can be closed locally). Once the MSIV is closed, a steam leak on the ruptured SG will be revealed and necessitate a procedure transition for faulted SG isolation. Intermediate Range Channel N36 will have a compensating voltage failure that will prevent the Source Ranges from energizing automatically. The operator will have to manually energize the Source Ranges. The scenario will be terminated when the crew reaches the target temperature for cooldown in the SGTR procedure.

The EOP procedures invoked will include:

- 0POP05-EO-EO00, Reactor Trip or Safety Injection (the EOP entry procedure)
- 0POP05-EO-EO30, SGTR
- 0POP05-EO-EO20, Faulted SG Isolation

Critical Tasks:

- Isolate feedflow into and steamflow from the ruptured SG before a transition to EC31 occurs
- Properly select and maintain target temperature for cooldown based on the chart provided in EO30.

Scenario Source: Bank scenario (LOT 13 Backup). Initial condition of equipment out of service was changed. Also, removed a power change evolution that was originally in the scenario and altered the scenario malfunctions such that the EOP procedure path changed.

## Scenario 2 Description

The plant is initially at 80% power with power escalation in progress following a shutdown to inspect turbine blading. Once the crew takes the watch, a steam pressure transmitter 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, Condensate Pump 11 will trip. The BOP operator must start the standby Condensate Pump to maintain Deaerator level; otherwise a manual reactor trip will be necessary. Once the standby Condensate Pump is in service, a control rod drops into the core. The crew will have to reduce power to below 75% to be ready to recover the control rod. After power is reduced a few percent, a second control rod in the same bank will drop into the core necessitating a reactor trip, however the reactor cannot be tripped manually or automatically. Operators must de-energize rod drive power from the Control Room to initiate a reactor trip. All other systems will initially function as designed on the reactor trip. After the crew transitions to 0POP05-EO-ES01, Reactor Trip Response, and checks RCS pressure, an RCS leak will develop that will require Safety Injection. At this time the crew will transition back to the EOP entry procedure. The scenario will terminate once the crew verifies swapover to Cold Leg Recirculation.

The EOP procedures invoked will include:

- 0POP05-EO-EO00, Reactor Trip or Safety Injection (the EOP entry procedure)
- 0POP05-EO-ES01, Reactor Trip Response
- 0POP05-EO-FRZ1, Response to High Containment Pressure
- 0POP05-EO-ES13, Transfer to Cold Leg Recirculation

Critical Tasks:

- Manually trip the reactor from the Control Room before completing step 1.0 of EO00.
- Transfer to Cold Leg Recirculation before RWST EMPTY alarm

Scenario Source: New

### Scenario 3 Description

Initially the plant is at approximately 60% power with power decrease in progress. Power increase is on hold to allow securing a SG Feedpump. Once the operator secures the SG Feedpump, a T-cold instrument in RCS loop 'B' will fail high. This will affect inputs to Pressurizer Level Control and Rod Control requiring the Reactor Operator to manually control these functions. Once the failed instrument is de-selected and control systems returned to normal, SG 1C level transmitter will fail low. This will result in a loss of automatic level control on 1C SG requiring manual operator action to prevent a plant trip. Once the 1C SG level control is returned to automatic, the 1C SG Main Feed Regulating Valve fails closed and cannot be opened. This will necessitate a Reactor trip. Once the crew leaves the EOP entry procedure, a Pressurizer steam space break will occur resulting in a Safety Injection. The crew will transition back to the EOP entry procedure and follow a different EOP path than at first. After Safety Injection actuation, a loss of power to ESF Bus '1A' occurs and the # 11 ESF Diesel Generator fails to automatically load. This will require the operator to manually load equipment for that train. The scenario will be terminated when the crew transitions to either OPOP05-EO-ES12, Post-LOCA Cooldown and Depressurization, or OPOP05-EO-ES13, Transfer to Cold Leg Recirculation.

The EOP procedures invoked will include:

- OPOP05-EO-EO00, Reactor Trip or Safety Injection (the EOP entry procedure)
- OPOP05-EO-ES01, Reactor Trip Response
- OPOP05-EO-FRZ1, Response to High Containment Pressure
- OPOP05-EO-ES10, Loss of Reactor or Secondary Coolant

Critical Tasks:

- Manually start at least one CCW Pump per operating safeguards train before transitioning from OPOP05-EO-EO00.
- Manually start at least one ECW Pump per operating safeguards train before transition out of tripping it's associated DG or exiting from OPOP05-EO-EO00.

Scenario Source: Bank Scenario (LOT 13 Scenario #1). Initial Conditions changed to delete a SGFP out of service and the initial power level. Other changes are:

- Changed normal evolution from swapping FW Booster Pumps to securing a SG Feedpump.
- Changed SGFPT trip to MFRV failing closed
- Changed timing of Pzr. steam space break to after entry into ES01.
- Changed post-EOP entry failure from HHSI pump to DG fails to load.

## **Backup Scenario Description**

The plant is initially at 40% power with a shutdown in progress to allow for turbine blade inspections. The National Weather Service has issued a Severe Weather Warning to be in effect until 2000 hrs. today, however, this will not play a part in the scenario. A normal evolution of swapping FW Booster pumps is first performed. Once this is done, the 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, Steam Header Pressure transmitter PT-557 will fail low. This will cause the operating SGFPs to slow down. Operator action will be required to stabilize the Feedwater system and SG levels. Once control has been established, Letdown pressure control valve, PCV-0135, will fail closed. This will cause a loss of normal letdown and require that Excess Letdown be placed in service. Following this, a steam break begins inside containment (ramped in over 5 minutes) on SG 1D. This will result in a Reactor trip, Safety Injection, and Main Steam Isolation. Phase 'A' Isolation will not automatically actuate, but can be manually actuated. The scenario is terminated once the crew secures HHSI in OPOP05-EO-ES11, SI Termination.

The EOP procedures invoked will include:

- OPOP05-EO-EO00, Reactor Trip or Safety Injection (the EOP entry procedure)
- OPOP05-EO-EO20, Faulted Steam Generator Isolation.
- OPOP05-EO-FRZ1, Response to High Containment Pressure
- OPOP05-EO-ES11, SI Termination

Critical Tasks:

- Isolate the faulted SG before transition out of EO20.
- Close Containment Isolation Valves such that at least one valve is closed on each Phase 'A' penetration before the end of the scenario.

Scenario Source: Bank Scenario (LOT 12 Scenario #4). Initial Conditions changed to delete a LHSI Pump out of service. Other changes are:

- Changed CCW pump trip to Boric Acid Pump Trip
- Changed Feedflow instrument failure to Steam Header Pressure Instrument failure.
- Added failure of Letdown Pressure Control Valve
- Changed major event from a SBLOCA to Steam Break inside RCB.
- Deleted failure of IR channel after the reactor trip.

## Probabilistic Risk Assessment Input Information

The following South Texas Project Probabilistic Risk Assessment (STP PRA) reports were reviewed to ensure that Events, Systems and Operator Actions which are important to plant safety or which contribute to driving events to a lower risk, are sampled throughout this examination:

- \$ ***Top Event Sequences*** - Identifies events which significantly contribute to core damage.
- \$ ***Most Risk Significant Systems*** - Identifies systems using a combination of Risk Achievement Worth (RAW) and Fussell-Vesely Importance.
- \$ ***Important Operator Actions*** - Identifies human interactions in the Individual Plant Examinations (IPE) which have a measurable effect on core damage frequency.

The cross-reference below lists some PRA items from these reports and links the items to specific areas within the examination. The cross-reference is not an attempt to identify all items from these reports nor all areas where these items are addressed. It simply shows how PRA items, suitable for testing, are addressed throughout the examination on a sampling basis.

PRA Item Description	Related Examination Areas
Operator starts PDP w/no CCP's (important operator action)	JPM S2 requires the operator to start the PDP and line it up to provide RCP seal cooling when both CCP's are unavailable.
Small LOCA (top event sequence)	Scenario #3 contains a steam break on the Reactor Coolant System Pressurizer
Large LOCA (top event sequence)	Scenario #2 contains a design basis large break LOCA
SGTR (top sequence event)	Scenario #1 contains a significant SGTR
Reactor Protection System (one of the most risk significant systems)	Scenario #2 requires operators trip the reactor using alternate means when the normal manual and automatic reactor trips fail to work.
SSPS fails (important operator actions)	Scenario #3 includes a failure of an ESF DG to automatically load. Operators must manually load necessary equipment.
Failure to recover a diesel generator or off-site power (important operator action)	JPM S3 gives the applicants an opportunity to manually energize an ESF bus
Chemical and Volume Control System (one of the most risk significant systems)	Scenario #1 provides opportunities to operate the CVCS through two malfunctions: trip of a CCP and failure of a VCT level instrument.
Safety Injection System (one of the most risk significant systems)	JPM S4 requires an operator to manually isolate SI Accumulators

Facility: <b>STP</b>		Date of Exam: <b>8/18/03</b>																	
Tier	Group	RO K/A Category Points												SRO-Only Points					
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	K	A	A2	G*	Total	
1. Emergency & Abnormal Plant Evolutions	1	3	2	3				7	3				0	18	0	2	3	2	7
	2	2	2	2				1	0				2	9	0	0	2	3	5
	Tier Totals	5	4	5				8	3				2	27	0	2	5	5	12
2. Plant Systems	1	2	2	3	3	2	3	3	2	2	4	2	28	0	0	2	2	4	
	2	3	0	1	0	2	0	1	1	2	0	0	10	0	0	2	0	2	
	Tier Totals	5	2	4	3	4	3	4	3	4	4	2	38	0	0	4	2	6	
3. Generic Knowledge and Abilities Categories				1		2		3		4		10	1		2		3		4
				2		3		2		3			2		1		2		
<p>Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier of the RO outline (i.e., the "Tier Totals" in each K/A category shall not be less than two). Refer to Section D.1.c for additional guidance regarding SRO sampling.</p> <p>2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by <math>\pm 1</math> from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.</p> <p>3. Select topics from many systems and evolutions; avoid selecting more than two K/A topics from a given system or evolution unless they relate to plant-specific priorities.</p> <p>4. Systems/evolutions within each group are identified on the associated outline.</p> <p>5. The shaded areas are not applicable to the category/tier.</p> <p>6. The generic (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. The SRO K/As must also be linked to 10 CFR 55.43 or an SRO-level learning objective.</p> <p>7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) 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; summarize all the SRO-only knowledge and non-A2 ability categories in the columns labeled "K" and "A." Use duplicate pages for RO and SRO-only exams.</p> <p>8. For Tier 3, enter the K/A numbers, descriptions, importance ratings, and point totals on Form ES-401-3.</p> <p>9. Refer to ES-401, Attachment 2, for guidance regarding the elimination of inappropriate K/A statements.</p>																			

ES-401		PWR Examination Outline							Form ES-401-2	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO)										
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	IR	#	
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1									0	
000008 Pressurizer Vapor Space Accident / 3					X		008.AA2.01 Determine and interpret RCS Press. and Temp. indicators and alarms as applied to...	3.9	1	
000009 Small Break LOCA / 3	X						009.EK1.01 Knowledge of operational implications of Natural Circ. and cooling, including reflux boiling as applies to...	4.2	1	
000011 Large Break LOCA / 3				X			011.EA1.13 Operate and monitor SI components during...	4.1	1	
000015/17 RCP Malfunctions / 4				X			015/017.AA1.21 Operate/monitor development of NC flow...	4.4	1	
000022 Loss of Rx Coolant Makeup / 2			X				022.AK3.05 Know. of reasons for avoiding plant transients during...	3.2	1	
000025 Loss of RHR System / 4									0	
000026 Loss of Component Cooling Water / 8									0	
000027 Pressurizer Pressure Control System Malfunction / 3		X					027.AK2.03 Interrelations between controllers and positioners and ...	2.6	1	
000029 ATWS / 1									0	
000038 Steam Gen. Tube Rupture / 3				X			038.EA1.29 Operate/monitor CVCS tank ind. And water sources...	3.5	1	
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4			X				040.AK3.04 Reasons for actions contained in EOPs for SLR	4.5	1	
000054 (CE/E06) Loss of Main Feedwater / 4	X						054.AK1.02 Operational implications of effects of feedwater introduction on dry S/G...	3.6	1	
000055 Station Blackout / 6	X						055.EK1.01 Op. implications of battery discharge rates on capacity	3.3	1	
000056 Loss of Off-site Power / 6				X			056.AA1.09 Operate/monitor CCW pump during LOOP	3.3	1	
000057 Loss of Vital AC Inst. Bus / 6				X			057.AA1.02 Operate/monitor manual control of PZR level...	3.8	1	
000058 Loss of DC Power / 6					X		058.AA2.03 Determine/Interpret DC loads lost and impact on ability to operate and monitor plant systems...	3.5	1	
000062 Loss of Nuclear Svc Water / 4					X		062.AA2.04 Determine/Interpret normal and upper limit values for Temp of SWS cooled components...	2.5	1	
000065 Loss of Instrument Air / 8			X				065.AK3.08 Reasons for actions contained in EOP for...	3.7	1	
W/E04 LOCA Outside Containment / 3		X					E04.EK2.1 Interrelations btwn LOCA outside ctmnt and: components and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.5	1	
W/E11 Loss of Emergency Coolant Recirc. / 4				X			E11.EA1.02 Operate/monitor operating behavior characteristics of the facility as relates to...	3.5	1	
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4				X			E05.EA1.1 Operate/monitor components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features...	4.1	1	
K/A Category Totals:	3	2	3	7	3	0	Group Point Total:			18/7

ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO)						Form ES-401-2	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	IR	#
000001 Continuous Rod Withdrawal / 1									0
000003 Dropped Control Rod / 1									0
000005 Inoperable/Stuck Control Rod / 1									0
000024 Emergency Boration / 1		X					024.AK2.03 Interrelationship btwn Controllers/positioners...	2.6	1
000028 Pressurizer Level Malfunction / 2		X					028.AK2.03 Interrelationship btwn Controllers/positioners...	2.6	1
000032 Loss of Source Range NI / 7									0
000033 Loss of Intermediate Range NI / 7			X				033.AK3.02 Reasons for guidance contained in EOP for...	3.6	1
000036 (BW/A08) Fuel Handling Accident / 8									0
000037 Steam Generator Tube Leak / 3				X			037.AA1.08 Operate/monitor charging flow indicator...	3.3	1
000051 Loss of Condenser Vacuum / 4									0
000059 Accidental Liquid RadWaste Rel. / 9									0
000060 Accidental Gaseous Radwaste Rel. / 9									0
000061 ARM System Alarms / 7						X	061.G2.3.4 Rad. Exposure limits and contamination control, including permissible levels in excess of auth...	2.5	1
000067 Plant Fire On-site / 8									0
000068 (BW/A06) Control Room Evac. / 8									0
000069 (W/E14) Loss of CTMT Integrity / 5									0
000074 (W/E06&E07) Inad. Core Cooling / 4									0
000076 High Reactor Coolant Activity / 9						X	076.G2.4.10 Annunciator response procedures...	3.0	1
W/E01 & E02 Rediagnosis & SI Termination / 3	X						E02.EK1.2 Normal, abnormal, and EOPs...	3.4	1
W/E13 Steam Generator Over-pressure / 4									0
W/E15 Containment Flooding / 5	X						E15.EK1.3 Op. Implications of Annunciators and conditions indicating signals, and remedial actions...	2.8	1
W/E16 High Containment Radiation / 9									0
BW/A01 Plant Runback / 1									0
BW/A02&A03 Loss of NNI-X/Y / 7									0
BW/A04 Turbine Trip / 4									0
BW/A05 Emergency Diesel Actuation / 6									0
BW/A07 Flooding / 8									0
BW/E03 Inadequate Subcooling Margin / 4									0
BW/E08; W/E03 LOCA Cooldown - Depress. / 4									0
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4									0
BW/E13&E14 EOP Rules and Enclosures									0
CE/A11; W/E08 RCS Overcooling - PTS / 4			X				E08.EK3.3 Reasons for control manipulations required to obtain desired results during abnormal and emergency...	3.7	1
CE/A16 Excess RCS Leakage / 2									0
CE/E09 Functional Recovery									0
K/A Category Point Totals:	2	2	2	1	0	2	Group Point Total:		9/5



ES-401 PWR Examination Outline Form ES-401-2													
Plant Systems - Tier 2/Group 1 (RO)													
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	IR #
003 Reactor Coolant Pump				X								003.K4.07 Design features/interlocks for minimizing RCS leakage (mechanical seals)...	3.2 1
004 Chemical and Volume Control										X		004.A4.18 Operate/Monitor emergency borate valve in the control room...	4.3 1
005 Residual Heat Removal						X						005.K6.03 Effects of loss of RHR HX on RHR sys...	2.5 1
006 Emergency Core Cooling					X				X			006.K5.09 Thermodynamics of H2O/STM, including subcooled margin, superheat, and saturation... 006.A2.03 Predict impact of and respond appropriately to system leakage...	3.3 2 3.3
007 Pressurizer Relief/Quench Tank	X											007.K1.03 Physical connections/relationships btwn PRTS and RCS	3.0 1
008 Component Cooling Water			X									008.K3.02 Effects of Loss of CCW on CRDS...	2.9 1
010 Pressurizer Pressure Control							X			X		010.A1.03 Predict/monitor PRT press. and temp. 010.A4.01 Operate/monitor PZR spray valve in CR...	2.9 2 3.7
012 Reactor Protection						X				X		012.K6.06 Effects of loss of Sensors/detectors... 012.A4.05 Operate/monitor channel defeat controls...	2.7 2 3.6
013 Engineered Safety Features Actuation						X			X			013.K6.01 Effects of loss of Sensors/detectors... 013.A3.01 Monitor automatic operation of Input channels and logic	2.7 2 3.7
022 Containment Cooling				X								022.K4.05 Design features/interlocks which provide for CCS after LOCA destroys ventilation ducts...	2.6 1
025 Ice Condenser													0
026 Containment Spray		X	X									026.K2.01 Power Supplies to CSS pumps 026.K3.02 Effects of loss of CSS on Recirc. Spray	3.4 2 4.2
039 Main and Reheat Steam								X				039.A2.01 Predict flow paths of stm during LOCA	3.1 1
056 Condensate	X										X	056.K1.03 Connections/relationships with MFW 056.G2.2.2 Manipulate the controls btwn shutdown and design power levels	2.6 2 4.0
059 Main Feedwater										X		059.A4.01 Operate/monitor MFW turbine trip ind...	3.1 1
061 Auxiliary/Emergency Feedwater				X								061.K4.12 AFW design/interlocks which provide for Natural Circulation Flow	3.5 1
062 AC Electrical Distribution											X	062.G2.4.6 Symptom based EOP mitigation strategies	3.1 1
063 DC Electrical Distribution			X									063.K3.02 Loss of DC effects on DC control power components...	3.5 1
064 Emergency Diesel Generator							X					064.A1.02 Predict fuel consumption rate with load	2.5 1
073 Process Radiation Monitoring					X							073.K5.03 Relationship btwn radiation intensity and exposure limits as they apply to PRM system	2.9 1
076 Service Water									X			076.A3.02 Monitor automatic operation of SWS as relates to Emergency heat loads	3.7 1
078 Instrument Air		X										078.K2.02 Power Supplies to Emergency Air Comp.	3.3 1
103 Containment							X					103.A1.01 Predict/monitor containment pressure, temperature, and humidity	3.7 1
K/A Category Point Totals:	2	2	3	3	2	3	3	2	2	4	2	Group Point Total:	28/4

ES-401		PWR Examination Outline Plant Systems - Tier 2/Group 2 (RO)												Form ES-401-2	
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)		IR	#
001 Control Rod Drive			X									001.K3.01 Effects of CRDS malfunction on CVCS		2.9	1
002 Reactor Coolant									X			002.A3.02 Monitor automatic operation of containment sound-monitoring system		2.6	1
011 Pressurizer Level Control					X							011.K5.13 Impact of high/low PZR level on interrelated systems		3.2	1
014 Rod Position Indication															0
015 Nuclear Instrumentation															0
016 Non-nuclear Instrumentation	X											016.K1.09 Connections/relationship with ESFAS		3.7	1
017 In-core Temperature Monitor															0
027 Containment Iodine Removal															0
028 Hydrogen Recombiner and Purge Control															0
029 Containment Purge															0
033 Spent Fuel Pool Cooling															0
034 Fuel Handling Equipment															0
035 Steam Generator															0
041 Steam Dump/Turbine Bypass Control								X				041.A2.03 Predict/respond to Loss of IAS as relates to SDS		2.8	1
045 Main Turbine Generator															0
055 Condenser Air Removal	X											055.K1.06 Connections/relationship to PRM system		2.6	1
068 Liquid Radwaste									X			068.A3.02 Monitor automatic isolation of LRS		3.6	1
071 Waste Gas Disposal															0
072 Area Radiation Monitoring							X					072.A1.01 Predict/Monitor radiation levels		3.4	1
075 Circulating Water	X											075.K1.01Connections/relationship with SWS		2.5	1
079 Station Air															0
086 Fire Protection					X							086.K5.04 Hazards to personnel as a result of fire type and methods of protection		2.9	1
K/A Category Point Totals:	3	0	1	0	2	0	1	1	2	0	0	Group Point Total:			10/2

ES-401		PWR Examination Outline							Form ES-401-2	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (SRO)										
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	IR	#	
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1									0	
000008 Pressurizer Vapor Space Accident / 3									0	
000009 Small Break LOCA / 3									0	
000011 Large Break LOCA / 3									0	
000015/17 RCP Malfunctions / 4					X		015/17.AA2.02 Determine/interpret abnormalities in RCP air vent flow paths and/or oil cooling system	3.0	1	
000022 Loss of Rx Coolant Makeup / 2									0	
000025 Loss of RHR System / 4									0	
000026 Loss of Component Cooling Water / 8					X		026.AA2.04 Determine/interpret normal values and upper limits for the temperatures of the components cooled by CCW	2.9	1	
000027 Pressurizer Pressure Control System Malfunction / 3									0	
000029 ATWS / 1									0	
000038 Steam Gen. Tube Rupture / 3									0	
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4									0	
000054 (CE/E06) Loss of Main Feedwater / 4									0	
000055 Station Blackout / 6				X			055.EA1.05 Operate/monitor battery, when apporaching fully discharged	3.6	1	
000056 Loss of Off-site Power / 6						X	056.G2.4.30 Which events should be reported to outside agencies	3.6	1	
000057 Loss of Vital AC Inst. Bus / 6						X	057.G2.4.45 Prioritize/interpret annunciator alarms	3.6	1	
000058 Loss of DC Power / 6									0	
000062 Loss of Nuclear Svc Water / 4									0	
000065 Loss of Instrument Air / 8									0	
W/E04 LOCA Outside Containment / 3				X			E04.EA1.3 Operate/monitor desired operating results during abnormal and emergency situations	4.0	1	
W/E11 Loss of Emergency Coolant Recirc. / 4									0	
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4					X		E05.EA2.1Determine/interpret facility conditions and selection of appropriate procedures during abnormal and emergency operations	4.4	1	
K/A Category Totals:	0	0	0	2	3	2	Group Point Total:		18/7	

ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (SRO)						Form ES-401-2	
E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	IR	#
000001 Continuous Rod Withdrawal / 1									0
000003 Dropped Control Rod / 1									0
000005 Inoperable/Stuck Control Rod / 1					X		005.AA2.01 Determine/interpret stuck or inoperable control rod from in-core and ex-core NIS, in-core or loop temperature measurements	4.1	1
000024 Emergency Boration / 1									0
000028 Pressurizer Level Malfunction / 2									0
000032 Loss of Source Range NI / 7									0
000033 Loss of Intermediate Range NI / 7						X	033.G2.4.11 Abnormal condition procedures	3.6	1
000036 (BW/A08) Fuel Handling Accident / 8									0
000037 Steam Generator Tube Leak / 3					X		037.AA2.12 Determine/interpret flow rate of leak	4.1	1
000051 Loss of Condenser Vacuum / 4									0
000059 Accidental Liquid RadWaste Rel. / 9									0
000060 Accidental Gaseous Radwaste Rel. / 9									0
000061 ARM System Alarms / 7									0
000067 Plant Fire On-site / 8									0
000068 (BW/A06) Control Room Evac. / 8						X	068.G2.4.1 EOP entry conditions and immediate actions	4.6	1
000069 (W/E14) Loss of CTMT Integrity / 5									0
000074 (W/E06&E07) Inad. Core Cooling / 4									0
000076 High Reactor Coolant Activity / 9									0
W/E01 & E02 Rediagnosis & SI Termination / 3									0
W/E13 Steam Generator Over-pressure / 4									0
W/E15 Containment Flooding / 5									0
W/E16 High Containment Radiation / 9						X	E16.G2.3.10 Procedures to reduce excessive levels of radiation and guard against personnel exposure	3.3	1
BW/A01 Plant Runback / 1									0
BW/A02&A03 Loss of NNI-X/Y / 7									0
BW/A04 Turbine Trip / 4									0
BW/A05 Emergency Diesel Actuation / 6									0
BW/A07 Flooding / 8									0
BW/E03 Inadequate Subcooling Margin / 4									0
BW/E08; W/E03 LOCA Cooldown - Depress. / 4									0
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4									0
BW/E13&E14 EOP Rules and Enclosures									0
CE/A11; W/E08 RCS Overcooling - PTS / 4									0
CE/A16 Excess RCS Leakage / 2									0
CE/E09 Functional Recovery									0
K/A Category Point Totals:	0	0	0	0	2	3	Group Point Total:		9/5

PWR Examination Outline														Form ES-401-2
Plant Systems - Tier 2/Group 1 (SRO)														
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	IR	#
003 Reactor Coolant Pump														0
004 Chemical and Volume Control														0
005 Residual Heat Removal														0
006 Emergency Core Cooling														0
007 Pressurizer Relief/Quench Tank														0
008 Component Cooling Water														0
010 Pressurizer Pressure Control											X	010.G.2.1.32 Explain/apply all limits/precautions	3.8	1
012 Reactor Protection														0
013 Engineered Safety Features Actuation														0
022 Containment Cooling														0
025 Ice Condenser														0
026 Containment Spray														0
039 Main and Reheat Steam														0
056 Condensate														0
059 Main Feedwater														0
061 Auxiliary/Emergency Feedwater														0
062 AC Electrical Distribution														0
063 DC Electrical Distribution								X				063.A2.01 Predict/respond to grounds	3.2	1
064 Emergency Diesel Generator											X	064.G.2.1.11 TS less-than-1-hour action statements	3.8	1
073 Process Radiation Monitoring														0
076 Service Water														0
078 Instrument Air								X				078.A2.01 Predict/respond to air dryer and filter malf.	2.9	1
103 Containment														0
K/A Category Point Totals:	0	0	0	0	0	0	0	2	0	0	2	Group Point Total:		28/4

ES-401														PWR Examination Outline														Form ES-401-2	
														Plant Systems - Tier 2/Group 2 (SRO)															
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	IR	#															
001 Control Rod Drive														0															
002 Reactor Coolant														0															
011 Pressurizer Level Control														0															
014 Rod Position Indication														0															
015 Nuclear Instrumentation														0															
016 Non-nuclear Instrumentation														0															
017 In-core Temperature Monitor														0															
027 Containment Iodine Removal														0															
028 Hydrogen Recombiner and Purge Control														0															
029 Containment Purge														0															
033 Spent Fuel Pool Cooling														0															
034 Fuel Handling Equipment								X				034.A2.01 Predict/respond to dropped fuel element	4.4	1															
035 Steam Generator														0															
041 Steam Dump/Turbine Bypass Control														0															
045 Main Turbine Generator														0															
055 Condenser Air Removal														0															
068 Liquid Radwaste														0															
071 Waste Gas Disposal														0															
072 Area Radiation Monitoring														0															
075 Circulating Water														0															
079 Station Air														0															
086 Fire Protection								X				086.A2.04 Predict/respond to failure to actuate the FPS when required, resulting in fire damage	3.9	1															
K/A Category Point Totals:	0	0	0	0	0	0	0	2	0	0	0	Group Point Total:		10/2															

ES-401		Generic Knowledge and Abilities Outline (Tier 3)			Form ES-401-3	
Facility: STP		Date of Exam: 8/18/03				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.11	Knowledge of >1hr TS action statements	3.0	1		
	2.1.19	Able to use Plant Computer to obtain/evaluate system status	3.0	1		
	2.1.					
	2.1.					
	2.1.					
	2.1.					
	Subtotal					
2. Equipment Control	2.2.26	Refueling administrative requirements	2.5	1		
	2.2.25	Bases in TS for LCO and safety limits	2.5	1		
	2.2.13	Tagging and clearance procedures	3.6	1		
	2.2.					
	2.2.					
	2.2.					
	Subtotal					
3. Radiation Control	2.3.1	10 CFR 20 and related facility radiation control requirements	2.6	1		
	2.3.2	Facility ALARA program	2.5	1		
	2.3.					
	2.3.					
	2.3.					
	2.3.					
	Subtotal					
4. Emergency Procedures / Plan	2.4.49	Perform immediate actions without reference to procedure	4.0	1		
	2.4.45	Prioritize/interpret each annunciator or alarm	3.3	1		
	2.4.7	Event based EOP mitigation strategies	3.1	1		
	2.4.					
	2.4.					
	2.4.					
	Subtotal					
Tier 3 Point Total				10		7

ES-401		Generic Knowledge and Abilities Outline (Tier 3)		Form ES-401-3		
Facility:		Date of Exam:				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.4	Shift staffing requirements			3.4	1
	2.1.7	Evaluate plant performance and make operational judgements			4.4	1
	2.1.					
	2.1.					
	2.1.					
	2.1.					
	Subtotal					
2. Equipment Control	2.2.5	Process for making changes to facility IAW FSAR			2.7	1
	2.2.					
	2.2.					
	2.2.					
	2.2.					
	2.2.					
	Subtotal					
3. Radiation Control	2.3.6	Requirements for reviewing and approving release permits			3.1	1
	2.3.9	Process for performing containment purge			3.4	1
	2.3.					
	2.3.					
	2.3.					
	2.3.					
	Subtotal					
4. Emergency Procedures / Plan	2.4.16	EOP implementation heirarchy and coordination w/ other proc.			4.0	1
	2.4.27	Fire in the plant procedure			3.5	1
	2.4.					
	2.4.					
	2.4.					
	2.4.					
	Subtotal					
Tier 3 Point Total				10		7