

Facility Name: Peach Bottom 2 & 3      Date of Exam: February 7, 2005																			
Tier	Group	RO K/A Category Points											Total	SRO-Only Points					
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *		A2	G*	Total			
1. Emergency & Abnormal Plant Evolutions	1	2	4	3				4	4				3	20	4	3	7		
	2	1	1	1	N/A			1	1	N/A			2	7	2	1	3		
	Tier Totals	3	5	4				5	5				5	27	6	4	10		
2. Plant Systems	1	2	2	3	3	2	3	2	2	2	3	2	26	4	1	5			
	2	1	1	1	1	1	1	1	1	1	2	1	12	2 <sup>N/A</sup> ①	1	3			
	Tier Totals	3	3	4	4	3	4	3	3	3	5	3	38	6	2	8			
3. Generic Knowledge and Abilities Categories					1	2	3	4						10	1	2	3	4	7
					3	3	2	2							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  $\pm 1$  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 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. 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.

NOTE ① THIS CATEGORY IN TIER 2, GROUP 2 INCLUDES 1 A2 K/A AND 1 A3 K/A (IN THE FULL HANDING AREA). THE LACK OF A WAY TO DOCUMENT IT ON THIS FORM WAS NOTED TO ES-401, Page 16 of 33

SIEGFRED GUERRA OF NRC. HE PROVIDED ADDITIONAL COMMENT TO THIS FORM.

ES-401		BWR Examination Outline							Form ES-401-1	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO)										
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#	
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4	0 2						Power/flow distribution	3.3	1	
295003 Partial or Complete Loss of AC / 6					0 1		Cause of partial or complete loss of A.C. power	3.4	1	
295004 Partial or Total Loss of DC Pwr / 6			0 1				Load shedding: Plant-Specific	2.6	1	
295005 Main Turbine Generator Trip / 3		0 7					Reactor pressure control	3.6	1	
295006 SCRAM / 1						04.0 4	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4	1	
295016 Control Room Abandonment / 7					0 2		Reactor water level	4.2	1	
295018 Partial or Total Loss of CCW / 8			0 3				Securing individual components (prevent equipment damage)	3.1	1	
295019 Partial or Total Loss of Inst. Air / 8				0 2			Instrument air system valves: Plant-Specific	3.3	1	
295021 Loss of Shutdown Cooling / 4					0 4		Reactor water temperature	3.6	1	
295023 Refueling Acc / 8		0 3					Radiation monitoring equipment	3.4	1	
295024 High Drywell Pressure / 5		1 1			0 2		Drywell spray (RHR) logic: Mark-I&II; Drywell temperature	4.2; 3.9	2	
295025 High Reactor Pressure / 3				0 3			Safety/relief valves: Plant-Specific	4.4	1	
295026 Suppression Pool High Water Temp. / 5		0 1					Suppression pool cooling	3.9	1	
295027 High Containment Temperature / 5							Not Applicable to Peach Bottom Units 2 & 3		0	
295028 High Drywell Temperature / 5				0 1			Drywell spray: Mark-I&II	3.8	1	
295030 Low Suppression Pool Wtr Lvl / 5	0 3						Heat capacity	3.8	1	
295031 Reactor Low Water Level / 2						01.2 8	Knowledge of the purpose and function of major system components and controls.	3.2	1	
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1						04.0 6	Knowledge symptom based EOP mitigation strategies.	3.1	1	
295038 High Off-site Release Rate / 9				0 6			Plant ventilation	3.5	1	
600000 Plant Fire On Site / 8			0 4				Actions contained in the abnormal procedure for plant fire on site	2.8	1	
K/A Category Totals:	2	4	3	4	4	3	Group Point Total:		20	

ES-401		BWR Examination Outline							Form ES-401-1	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO)										
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#	
295002 Loss of Main Condenser Vac / 3					0 4	0 4	Offgas system flow	2.8	1	
295007 High Reactor Pressure / 3					0 4	0 4			0	
295008 High Reactor Water Level / 2		0 6			0 4	0 4	RCIC: Plant-Specific	3.4	1	
295009 Low Reactor Water Level / 2					0 4	0 4			0	
295010 High Drywell Pressure / 5					0 4	0 4			0	
295011 High Containment Temp / 5					0 4	0 4			0	
295012 High Drywell Temperature / 5					0 4	0 4			0	
295013 High Suppression Pool Temp. / 5					01 33	01 33	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.	3.4	1	
295014 Inadvertent Reactivity Addition / 1					0 4	0 4			0	
295015 Incomplete SCRAM / 1			0 1		0 4	0 4	Bypassing rod insertion blocks	3.4	1	
295017 High Off-site Release Rate / 9					0 4	0 4			0	
295020 Inadvertent Cont. Isolation / 5 & 7					0 4	0 4			0	
295022 Loss of CRD Pumps / 1					0 4	0 4			0	
295029 High Suppression Pool Wtr Lvl / 5					04 00	04 00	Knowledge symptom based EOP mitigation strategies.	3.1	1	
295032 High Secondary Containment Area Temperature / 5					0 4	0 4			0	
295033 High Secondary Containment Area Radiation Levels / 9	0 2				0 4	0 4	Personnel protection	3.9	1	
295034 Secondary Containment Ventilation High Radiation / 9				0 3	0 4	0 4	Secondary containment ventilation	4	1	
295035 Secondary Containment High Differential Pressure / 5					0 4	0 4			0	
295036 Secondary Containment High Sump/Area Water Level / 5					0 4	0 4			0	
500000 High CTMT Hydrogen Conc. / 5					0 4	0 4			0	
K/A Category Totals:	1	1	1	1	1	2	Group Point Total:		7	

ES-401		BWR Examination Outline Plant Systems - Tier 2/Group 1 (RO)												Form ES-401-1	
E/APE # / Name / Safety Function	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)		IR	#
203000 RHR/LPCI: Injection										0 2	01 32	System valves; Ability to explain and apply system limits and precautions.		4.1; 3.4	2
205000 Shutdown Cooling Mode		0 2										Motor operated valves		2.5	1
206000 HPCI				0 3			0 7					Resetting turbine trips: BWR-2, 3, 4; System discharge pressure: BWR-2, 3, 4		4.2; 3.7	2
207000 Isolation (Emergency) Condenser												Not Applicable to Peach Bottom Units 2 & 3			0
209001 LPCS	0 8											A.C. electrical power		3.2	1
209002 HPCS												Not Applicable to Peach Bottom Units 2 & 3			0
211000 SLC			0 3							0 3		Core plate differential pressure indication ; Explosive valves firing circuit status		2.6; 4.1	2
212000 RPS		0 1									01 28	RPS motor-generator sets; Knowledge of the purpose and function of major system components and controls.		3.2; 3.2	2
215003 IRM						0 2						24/48 volt D.C. power: Plant-Specific		3.6	1
215004 Source Range Monitor												Not Applicable to Peach Bottom Units 2 & 3			0
215005 APRM / LPRM								0 2				Upscale or downscale trips		3.6	1
217000 RCIC						0 1						Electrical power		3.4	1
218000 ADS						0 2				0 2		Low pressure core spray system pressure: Plant-Specific; ADS logic initiation		4.1; 4.2	2
223002 PCIS/Nuclear Steam Supply Shutoff								0 1				A.C. electrical distribution failures		3.2	1
239002 SRVs				0 5								Allows for SRV operation from more than one location: Plant Specific		3.6	1
259002 Reactor Water Level Control							0 7					TDRFP speed: TDRFP		2.6	1
261000 SGTS										0 1		System flow		3.2	1
262001 AC Electrical Distribution					0 2							Breaker control		2.6	1
262002 UPS (AC/DC)	1 9											Power range neutron monitoring system: Plant-Specific		2.9	1
263000 DC Electrical Distribution										0 1		Meters, dials, recorders, alarms, and indicating lights		3.2	1
264000 EDGs			0 1		0 5							Emergency core cooling systems; Paralleling A.C. power sources		4.2; 3.4	2
300000 Instrument Air				0 1								Manual/automatic transfers of control		2.8	1
400000 Component Cooling Water			0 1									Loads cooled by CCWS		2.9	1
K/A Category Totals:	2	2	3	3	2	3	2	2	2	3	2	Group Point Total:			26

ES-401		BWR Examination Outline												Form ES-401-1	
Plant Systems - Tier 2/Group 2 (RO)															
E/APE # / Name / Safety Function	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#	
201001 CRD Hydraulic														0	
201002 RMCS														0	
201003 Control Rod and Drive Mechanism														0	
201004 RSCS														0	
201005 RCIS														0	
201006 RWM							0 3					Latched group indication: P-Spec(Not-BWR6)	2.9	1	
202001 Recirculation														0	
202002 Recirculation Flow Control				0 6								Recirculation pump adequate NPSH: Plant-Specific	3.1	1	
204000 RWCU									0 1			System pumps	3.1	1	
214000 RPIS								0 1				Failed reed switches	3.1	1	
215001 Traversing In-core Probe														0	
215002 RBM														0	
216000 Nuclear Boiler Inst.														0	
219000 RHR/LPCI: Torus/Pool Cooling Mode		0 2										Pumps	3.1	1	
223001 Primary CTMT and Aux.						1 3						Applicable plant air system/ nitrogen make-up system.	3.2	1	
226001 RHR/LPCI: CTMT Spray Mode									0 3			Spray valves	3.5	1	
230000 RHR/LPCI: Torus/Pool Spray Mode														0	
233000 Fuel Pool Cooling/Cleanup														0	
234000 Fuel Handling Equipment														0	
239001 Main and Reheat Steam								0 1				Isolation of main steam system	4.2	1	
239003 MSIV Leakage Control														0	
241000 Reactor/Turbine Pressure Regulator										01 90		Ability to locate and operate components, including local controls.	3.9	1	
245000 Main Turbine Gen. / Aux.														0	
256000 Reactor Condensate														0	
259001 Reactor Feedwater					0 2							Water hammer	2.5	1	
268000 Radwaste														0	
271000 Offgas														0	
272000 Radiation Monitoring			1 0									Control room ventilation: Plant-Specific	2.9	1	
286000 Fire Protection														0	
288000 Plant Ventilation														0	
290001 Secondary CTMT														0	
290003 Control Room HVAC														0	
290002 Reactor Vessel Internals	0 2											Recirculation system	3.2	1	
K/A Category Totals:	1	1	1	1	1	1	1	1	1	2	1	Group Point Total:		12	

ES-401		BWR Examination Outline							Form ES-401-1	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (SRO)										
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#	
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4					0 1		Power/flow map	3.8	1	
295003 Partial or Complete Loss of AC / 6									0	
295004 Partial or Total Loss of DC Pwr / 6						02. 22	Knowledge of limiting conditions for operations and safety limits.	4.1	1	
295005 Main Turbine Generator Trip / 3									0	
295006 SCRAM / 1									0	
295016 Control Room Abandonment / 7									0	
295018 Partial or Total Loss of CCW / 8									0	
295019 Partial or Total Loss of Inst. Air / 8									0	
295021 Loss of Shutdown Cooling / 4									0	
295023 Refueling Acc / 8									0	
295024 High Drywell Pressure / 5						02. 25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	1	
295025 High Reactor Pressure / 3									0	
295026 Suppression Pool High Water Temp. / 5									0	
295027 High Containment Temperature / 5									0	
295028 High Drywell Temperature / 5					0 1		Drywell temperature	4.1	1	
295030 Low Suppression Pool Wtr Lvl / 5					0 2		Suppression pool temperature	3.9	1	
295031 Reactor Low Water Level / 2									0	
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1					0 2		Reactor water level	4.2	1	
295038 High Off-site Release Rate / 9									0	
600000 Plant Fire On Site / 8						04. 30	Knowledge of which events related to system operations/status should be reported to outside agencies.	3.6	1	
K/A Category Totals:	0	0	0	0	4	3	Group Point Total:		7	

ES-401		BWR Examination Outline							Form ES-401-1	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (SRO)										
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#	
295002 Loss of Main Condenser Vac / 3									0	
295007 High Reactor Pressure / 3									0	
295008 High Reactor Water Level / 2									0	
295009 Low Reactor Water Level / 2					0 2		Steam flow/feedflow mismatch	3.7	1	
295010 High Drywell Pressure / 5									0	
295011 High Containment Temp / 5									0	
295012 High Drywell Temperature / 5									0	
295013 High Suppression Pool Temp. / 5									0	
295014 Inadvertent Reactivity Addition / 1									0	
295015 Incomplete SCRAM / 1									0	
295017 High Off-site Release Rate / 9					0 4		Source of off-site release	4.3	1	
295020 Inadvertent Cont. Isolation / 5 & 7									0	
295022 Loss of CRD Pumps / 1						02. 25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	1	
295029 High Suppression Pool Wtr Lvl / 5									0	
295032 High Secondary Containment Area Temperature / 5									0	
295033 High Secondary Containment Area Radiation Levels / 9									0	
295034 Secondary Containment Ventilation High Radiation / 9									0	
295035 Secondary Containment High Differential Pressure / 5									0	
295036 Secondary Containment High Sump/Area Water Level / 5									0	
500000 High CTMT Hydrogen Conc. / 5									0	
K/A Category Totals:	0	0	0	0	2	1	Group Point Total:		3	

ES-401		BWR Examination Outline											Form ES-401-1	
Plant Systems - Tier 2/Group 1 (SRO)														
E/APE # / Name / Safety Function	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
203000 RHR/LPCI: Injection														0
205000 Shutdown Cooling Mode														0
206000 HPCI								0	7			Low suppression pool level: BWR-2, 3, 4	3.6	1
207000 Isolation (Emergency) Condenser														0
209001 LPCS														0
209002 HPCS														0
211000 SLC														0
212000 RPS														0
215003 IRM														0
215004 Source Range Monitor														0
215005 APRM / LPRM														0
217000 RCIC														0
218000 ADS								0	3			Loss of air supply to ADS valves: Plant-Specific	3.6	1
223002 PCIS/Nuclear Steam Supply Shutoff								1	1			Standby liquid initiation	3.9	1
239002 SRVs											02, 25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	1
259002 Reactor Water Level Control														0
261000 SGTS														0
262001 AC Electrical Distribution														0
262002 UPS (AC/DC)														0
263000 DC Electrical Distribution														0
264000 EDGs								0	7			Loss of off-site power during full-load testing	3.7	1
300000 Instrument Air														0
400000 Component Cooling Water														0
K/A Category Totals:	0	0	0	0	0	0	0	4	0	0	1	Group Point Total:		5



ES-401		BWR Examination Outline											Form ES-401-1	
Plant Systems - Tier 2/Group 2 (SRO)														
E/APE # / Name / Safety Function	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
201001 CRD Hydraulic														0
201002 RMCS														0
201003 Control Rod and Drive Mechanism														0
201004 RSCS														0
201005 RCIS														0
201006 RWM														0
202001 Recirculation											02.22	Knowledge of limiting conditions for operations and safety limits.	4.1	1
202002 Recirculation Flow Control														0
204000 RWCUC														0
214000 RPIS														0
215001 Traversing In-core Probe														0
215002 RBM														0
216000 Nuclear Boiler Inst.												Instrument line leakage	3.1	1
219000 RHR/LPCI: Torus/Pool Cooling Mode														0
223001 Primary CTMT and Aux.														0
226001 RHR/LPCI: CTMT Spray Mode														0
230000 RHR/LPCI: Torus/Pool Spray Mode														0
233000 Fuel Pool Cooling/Cleanup														0
234000 Fuel Handling Equipment									0.2			Interlock operation	3.7	1
239001 Main and Reheat Steam														0
239003 MSIV Leakage Control														0
241000 Reactor/Turbine Pressure Regulator														0
245000 Main Turbine Gen. / Aux.														0
256000 Reactor Condensate														0
259001 Reactor Feedwater														0
268000 Radwaste														0
271000 Offgas														0
272000 Radiation Monitoring														0
286000 Fire Protection														0
288000 Plant Ventilation														0
290001 Secondary CTMT														0
290003 Control Room HVAC														0
290002 Reactor Vessel Internals														0
K/A Category Totals:	0	0	0	0	0	0	0	1	1	0	1	Group Point Total:		3

Facility Name: Peach Bottom 2 &amp; 3 Date of Exam: February 7, 2005

Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1. 05	Ability to locate and use procedures and directives related to shift staffing and activities.			3.4	1
	2.1. 22	Ability to determine Mode of Operation.			3.3	1
	2.1. 03	Knowledge of shift turnover practices.	3	1		
	2.1. 25	Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data.	2.8	1		
	2.1. 29	Knowledge of how to conduct and verify valve lineups.	3.4	1		
	2.1.					
	Subtotal			3		2
2. Equipment Control	2.2. 23	Ability to track limiting conditions for operations.			3.8	1
	2.2. 29	Knowledge of SRO fuel handling responsibilities.			3.8	1
	2.2. 02	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.	4	1		
	2.2. 12	Knowledge of surveillance procedures.	3	1		
	2.2. 30	Knowledge of RO duties in the control room during fuel handling such as alarms from fuel handling area / communication with fuel storage facility / systems operated from the control room in support of fueling operations / and supporting instrumentation.	3.5	1		
	2.2.					
	Subtotal			3		2
3. Radiation Control	2.3. 02	Knowledge of facility ALARA program.			2.9	1
	2.3. 01	Knowledge of 10 CFR 20 and related facility radiation control requirements.	2.6	1		
	2.3. 04	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5	1		
	2.3.					
	2.3.					
	2.3.					
	Subtotal			2		1
4. Emergency Procedures / Plan	2.4. 04	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	1
	2.4. 12	Knowledge of general operating crew responsibilities during emergency operations.	3.4	1		
	2.4. 49	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4	1		
	2.4.					
	2.4.					
	Subtotal			2		2
Tier 3 Point Total				10		7

Facility: Peach BottomDate of Examination: Weeks of February 7 & 14, 2005Examination Level (circle one): **RO** / SROOperating Test Number: RO

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations Temporary Procedure Change	D, P, S	Initiate A Temporary Procedure Change.
Conduct of Operations Parameter Verification	N, S	Drywell Bulk Average Manual Temperature Verification.
Equipment Control P&IDs/ Clearance Points	N, S	Use station prints to identify component Clearance Points.
Radiation Control	N/A	Not Required.
Emergency Plan Emergency Communications	N, S	Perform State and Local Notifications following the declaration of an Emergency Condition.

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 & Criteria: (C)ontrol room

(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)

(S)imulator

Facility: Peach BottomDate of Examination: Weeks of February 7 & 14, 2005Examination Level (circle one): RO / **SRO**Operating Test Number: SRO

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations Procedure Modification	N, S	Authorize a deviation from the Control Rod Sequence on a Control Rod Move Sheet.
Conduct of Operations Parameter Verification	D, P, S	Conduct a Manual Heat Balance.
Equipment Control Clearance and Tagging	N, S	Evaluate a Clearance for approval.
Radiation Control Authorizing Emergency Exposure	N, S	Authorize an Emergency Exposure.
Emergency Plan Emergency Notifications.	N, S	Prepare the State and Local Notification Form for an Emergency 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.

\* Type Codes & Criteria: (C)ontrol room

(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)

(S)imulator

Facility: Peach BottomDate of Examination: Week of February 7 & 14, 2005Exam Level (circle one): **RO** / SRO(I) / SRO(U)Operating Test Number: ROControl Room Systems<sup>@</sup> (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)

System / JPM Title	Type Code	Safety Function
a. Standby Liquid Control (SBLC) / Inject Boron into the RPV (Alternate Path - Low SBLC Pump Discharge Pressure)	A, N, S	1
b. Reactor Core Isolation Cooling (RCIC) / Manual System Startup (Alternate Path - Cooling Water Valve Fails to Open Automatically)	A, N, S (ESF)	2
c. Automatic Depressurization System (ADS) / ADS Reset Following Blowdown	D, S, L (ESF)	3
d. High Pressure Coolant Injection (HPCI) / Raise HPCI Flow (Alternate Path - Suction Valves Fail to Auto Swap on Low CST Level)	A, M, S (ESF)	4
e. Containment Atmosphere Dilution (CAD) / Nitrogen Addition to the Containment during Normal Operations	D, S	5
f. Emergency Generators / Diesel Generator Synchronization and Loading	M, S (ESF)	6
g. Component Cooling Water / Verify proper isolation of Drywell Chilled Water (DWCW) and Reactor Building Closed Cooling Water (RBCCW).	N, S, L	8
h. Offgas System / Place the Standby Steam Jet Air Ejector (SJAE) in Service	D, S	9

In-Plant Systems<sup>@</sup> (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)

i. Main and Reheat Steam / Closing a Stuck Open Main Steam Isolation Valve (MSIV) (Alternate Path - AC Fuses fail to close MSIV)	M, A, E, L, R (ESF)	3
j. Reactor Protection System (RPS) / Scram Solenoid Deenergization	D, E, R (ESF)	7
k. Plant Ventilation / Restoring Control Room Ventilation following a High Radiation Trip	D, R	9

<sup>@</sup> All control room (and in-plant) systems must be different and 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) Alternate path	4-6 / 4-6 / 2-3

(C)ontrol room (D)irect from bank (E)mergency or abnormal in-plant (L)ow-Power (N)ew or (M)odified from bank including 1(A) (P)revious 2 exams  (R)CA (S)imulator	$\leq 9 / \leq 8 / \leq 4$ $\geq 1 / \geq 1 / \geq 1$ $\geq 1 / \geq 1 / \geq 1$ $\geq 2 / \geq 2 / \geq 1$ $\leq 3 / \leq 3 / \leq 2$ (randomly selected) $\geq 1 / \geq 1 / \geq 1$
Engineered Safeguard Feature (ESF)	ESF systems referenced from those listed in Section 1.6.2 of the Peach Bottom UFSAR.

Facility: <u>Peach Bottom</u>		Date of Examination: <u>Week of February 7 &amp; 14, 2005</u>	
Exam Level (circle one): <u>RO / SRO(I) / SRO(U)</u>		Operating Test Number: <u>SRO (I)</u>	
Control Room Systems <sup>@</sup> (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)			
System / JPM Title		Type Code	Safety Function
a. Standby Liquid Control (SBLC) / Inject Boron into the RPV (Alternate Path - Low SBLC Pump Discharge Pressure)		A, N, S	1
b. Reactor Core Isolation Cooling (RCIC) / Manual System Startup (Alternate Path - Cooling Water Valve Fails to Open Automatically)		A, N, S (ESF)	2
c. Automatic Depressurization System (ADS) / ADS Reset Following Blowdown		D, S, L (ESF)	3
d. High Pressure Coolant Injection (HPCI) / Raise HPCI Flow (Alternate Path - Suction Valves Fail to Auto Swap on Low CST Level)		A, D, S (ESF)	4
e. Containment Atmosphere Dilution (CAD) / Nitrogen Addition to the Containment during Normal Operations		D, S	5
f. Emergency Generators / Diesel Generator Synchronization and Loading		M, S (ESF)	6
g. Component Cooling Water / Verify proper isolation of Drywell Chilled Water (DWCW) and Reactor Building Closed Cooling Water (RBCCW).		N, S, L	8
In-Plant Systems <sup>@</sup> (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)			
h. Main and Reheat Steam / Closing a Stuck Open Main Steam Isolation Valve (MSIV) (Alternate Path - AC Fuses fail to close MSIV)		M, A, E, L, R (ESF)	3
i. Reactor Protection System (RPS) / Scram Solenoid Deenergization		D, E, R (ESF)	7
j. Plant Ventilation / Restoring Control Room Ventilation following a High Radiation Trip		D, R	9
<p><sup>@</sup> All control room (and in-plant) systems must be different and serve different safety functions; in-plant systems and functions may overlap those tested in the control room.</p>			
*Type Codes		Criteria for RO / SRO-I / SRO-U	
(A)lternate path		4-6 / 4-6 / 2-3	
(C)ontrol room			
(D)irect from bank		≤ 9 / ≤ 8 / ≤ 4	

(E)mergency or abnormal in-plant	$\geq 1 / \geq 1 / \geq 1$
(L)ow-Power	$\geq 1 / \geq 1 / \geq 1$
(N)ew or (M)odified from bank including 1(A)	$\geq 2 / \geq 2 / \geq 1$
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$
(R)CA	(randomly selected)
(S)imulator	$\geq 1 / \geq 1 / \geq 1$
Engineered Safeguard Feature (ESF)	ESF systems referenced from those listed in Section 1.6.2 of the Peach Bottom UFSAR.



Facility: <u>Peach Bottom</u>		Date of Examination: <u>Week of February 7 &amp; 14, 2005</u>	
Exam Level (circle one): RO / SRO(I) / <b>SRO(U)</b>		Operating Test Number: <u>SRO (U)</u>	
Control Room Systems <sup>®</sup> (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)			
System / JPM Title		Type Code	Safety Function
a. Standby Liquid Control (SBLC) / Inject Boron into the RPV (Alternate Path - Low SBLC Pump Discharge Pressure)		A, N, S	1
b. Reactor Core Isolation Cooling (RCIC) / Manual System Startup (Alternate Path - Cooling Water Valve Fails to Open Automatically)		A, N, S (ESF)	2
c. Component Cooling Water / Verify proper isolation of Drywell Chilled Water (DWCW) and Reactor Building Closed Cooling Water (RBCCW).		N, S, L	8
In-Plant Systems <sup>®</sup> (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)			
d. Main and Reheat Steam / Closing a Stuck Open Main Steam Isolation Valve (MSIV) (Alternate Path - AC Fuses fail to close MSIV)		M, A, E, L, R (ESF)	3
e. Reactor Protection System (RPS) / Scram Solenoid Deenergization		D, E, R (ESF)	7
<p>@ All control room (and in-plant) systems must be different and serve different safety functions; in-plant systems and functions may overlap those tested in the control room.</p>			
*Type Codes		Criteria for RO / SRO-I / SRO-U	
(A)lternate path		4-6 / 4-6 / 2-3	
(C)ontrol room			
(D)irect from bank		$\leq 9 / \leq 8 / \leq 4$	
(E)mergency or abnormal in-plant		$\geq 1 / \geq 1 / \geq 1$	
(L)ow-Power		$\geq 1 / \geq 1 / \geq 1$	
(N)ew or (M)odified from bank including 1(A)		$\geq 2 / \geq 2 / \geq 1$	
(P)revious 2 exams		$\leq 3 / \leq 3 / \leq 2$	
		(randomly selected)	
(R)CA		$\geq 1 / \geq 1 / \geq 1$	
(S)imulator			
Engineered Safeguard Feature (ESF)		ESF systems referenced from those listed in Section 1.6.2 of the Peach Bottom UFSAR.	

# Scenario Outline

ES-D-1

Simulation Facility Peach Bottom

Scenario No.

#1

Op Test No.

Examiners

Operators

CRS

PRO

URO

## Scenario Summary

The scenario begins with the reactor at 4% power during a reactor startup. The E-1 Diesel Generator is 14 hours into a 24 hour surveillance run. During the turnover, the crew is directed to swap RBCCW pumps for inspection of a noisy bearing on the 'B' RBCCW pump. Following the swap of RBCCW, the crew is to continue with the reactor startup pulling control rods in accordance with the approved startup sequence. A trip of the running ESW pump with a failure of the auto-start on the standby pump will require the operators to manually start the standby pump and consult Tech Specs.

After the Tech Spec determination, a high Standby Liquid Control Tank temperature alarm will be received. An investigation will determine that the tank heater had stuck on and the crew should take action to open the breaker for the heater. A review of Tech Specs will result in the SBLC system being considered inoperable due to the loss of NPSH to the pumps.

Once the Tech Spec interpretation is complete, a recirc leak develops in the drywell requiring entry into OT-101, High Drywell Pressure. The crew will take actions for the rising drywell pressure and will manually scram the reactor and enter T-101, RPV Control. During the scram, five rods will fail to insert resulting in an ATWS.

Attempts to spray the drywell will fail due to a drywell spray logic failure and the crew will need to perform a T-112, Emergency Blowdown when drywell temperature cannot be maintained below 281 degrees F. With several rods stuck out, the crew will need to terminate and prevent injection in accordance with T-240 prior to the emergency depressurization. The scenario may be terminated when the RPV depressurization is performed.

Initial Condition IC-121, 4% power

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malfunction No.	Event Type*	Event Description
1		N ATC BOP SRO	Swap of RBCCW pumps.
2		R ATC SRO	Power Ascension with Control Rods.
3	Override	I BOP SRO	ESW Pump Trip and failure of the Standby to Auto-Start (Tech Spec).
4	Override	C ATC BOP SRO	Standby Liquid Control Tank High Temperature (Tech Spec).
5	RRS20	M ATC BOP SRO	Recirculation System leak in the drywell.
6	Preinserted CRM02XXXX	C ATC BOP SRO	Five Rods stick full out during the scram.
7	Preinserted Override	I ATC BOP SRO	DW Spray Valve Logic Failure prevents Drywell Sprays.

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

# Scenario Outline

ES-D-1

Simulation Facility Peach Bottom Scenario No. #2 Op Test No.

Examiners \_\_\_\_\_ Operators \_\_\_\_\_ CRS  
 \_\_\_\_\_ PRO  
 \_\_\_\_\_ URO

**Scenario Summary** The scenario begins with the reactor at 100% power with a RCIC surveillance in progress. Following the RCIC testing, the crew is to commence a GP-3, Normal Plant Shutdown.

After the RCIC turbine is started, a low lube oil pressure alarm is received (similar to a recent Peach Bottom HPCI event). The crew will shutdown RCIC and complete a Tech Spec interpretation. The crew will then commence a GP-3, Normal Plant Shutdown. After the reactivity manipulation has been observed, the running Control Rod Drive pump will trip. The crew will pursue the issue using ON-107, Loss of CRD Regulating function. The inability to restore either CRD pump for 20 minutes after CRD Charging Header pressure drops below 940 psig with two accumulator alarms, will result in a required Tech Spec scram.

When the RO attempts to shutdown the plant, an electrical ATWS will occur requiring entry into T-101, RPV Control. Shortly after tripping the recirculation pumps, the 'D' SRV will fail full open requiring entry into OT-114, Stuck Open Safety Relief Valve, and ultimately T-102, Primary Containment Control.

When the RO maximizes torus cooling, the 'A' Loop RHR Torus Cooling Valve (MO-39A) will trip on magnetic overcurrent resulting in no Torus Cooling on the 'A' Loop of RHR causing torus conditions continue to degrade. This will result in an entry into T-102, Primary Containment Control when 95°F is reached. When torus temperature cannot be maintained below 110°F, Standby Liquid Control (SBLC) will be attempted and the pumps will fail to start.

After level has been lowered to control power, the ATWS will be terminated by T-214, Venting the Scram Air Header. The scenario may be terminated after all control rods are verified inserted.

**Initial Condition** IC-122, 100% power with the 'B' loop of Torus Cooling in service.

**Turnover:** See Attached "Shift Turnover" Sheet

Event No.	Malfunction No.	Event Type*	Event Description
1		N PRO CRS	Perform RCIC Surveillance Test.
2	Preinserted Override on Event Trigger	C PRO CRS	RCIC Low Lube Oil Pressure Alarm (Tech Spec).
3		R URO PRO CRS	Commence GP-3, Normal Plant Shutdown with Control Rods.
4	CRH03	C URO PRO CRS	Loss of Control Rod Drive System pumps results in a Tech Spec required scram when it cannot be restored promptly (Tech Spec)
5	Preinserted Overrides	M PRO CRS	Electrical ATWS.
6	Preinserted MSS08D	C URO PRO CRS	Safety Relief Valve 'D' fails open

7	Preinserted Override	C	PRO	'A' RHR Loop Torus Cooling valve fails closed limiting torus cooling.
8	Preinserted SLC01	I	URO PRO CRS	Standby Liquid Control Pumps fail to start.

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

# Scenario Outline

ES-D-1

Simulation Facility Peach Bottom

Scenario No.

#3

Op Test No.

Examiners

Operators

CRS

PRO

URO

## Scenario Summary

The scenario begins with the reactor at 95% power. The turnover directs the crew to swap Control Rod Drive (CRD) Flow Control Valves when maintenance is ready to observe operation of the standby valve.

Shortly after assuming the shift, a Drywell Pressure Instrument will fail upscale without inserting the appropriate half reactor scram. The crew will apply tech specs and insert the half scram using GP-25, Installation of Trips/Isolations to satisfy Tech Spec/TRM Requirements. After the scram is inserted, maintenance will call requesting that the CRD flow control valve be swapped to the standby valve. When it is swapped, it will be recognized that the standby valve is failed open and CRD will be swapped back to the original flow controller. When the swap is complete, a single control rod will begin to drift. The crew will enter ON-121, Drifting Control Rod and drive the rod in. A fast power reduction to 950 Mwe will be required due to the drifted control rod. Again, the crew will review and apply the tech spec requirements for these conditions.

A leak develops in the Reactor Water Cleanup (RWCU) System and the crew will enter T-103, Secondary Containment Control. The RWCU valves cannot be isolated and a T-112, Emergency Depressurization will be required when max safe temperatures are exceeded in two areas. If the Bypass Jack is attempted for a normal or a rapid depressurization, it will fail to function. When the manual blowdown is initiated, the 'C' SRV will not open, requiring the crew to open an alternate SRV.

Initial Condition IC-123, 95% Power, Full Power Rod Pattern

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malfunction No.	Event Type*	Event Description
1	Overrides	I URO PRO CRS	Drywell Pressure Instrument fails upscale without the expected half scram (Tech Spec).
2		N URO PRO CRS	Swap Control Rod Drive Flow Control Valves.
3	Preinserted CRH03B	C URO PRO CRS	Control Rod Drive Flow Control Valve Fails Open.
4	CRH043035	C URO PRO CRS	Single Control Rod Drifts (Tech Spec).
5		R URO PRO CRS	Fast Power Reduction due to the Drifting Control Rod.
6	RWC06	M URO PRO CRS	RWCU Leak in the Reactor Building.
7	Preinserted Overrides	C URO PRO CRS	RWCU Isolation Valves Fail Open.
8	Preinserted Overrides	I URO PRO CRS	Bypass Jack Control Fails.

9	Preinserted MSS08C	C	URO PRO CRS	ADS SRV 'C' Fails to open manually.
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• (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor